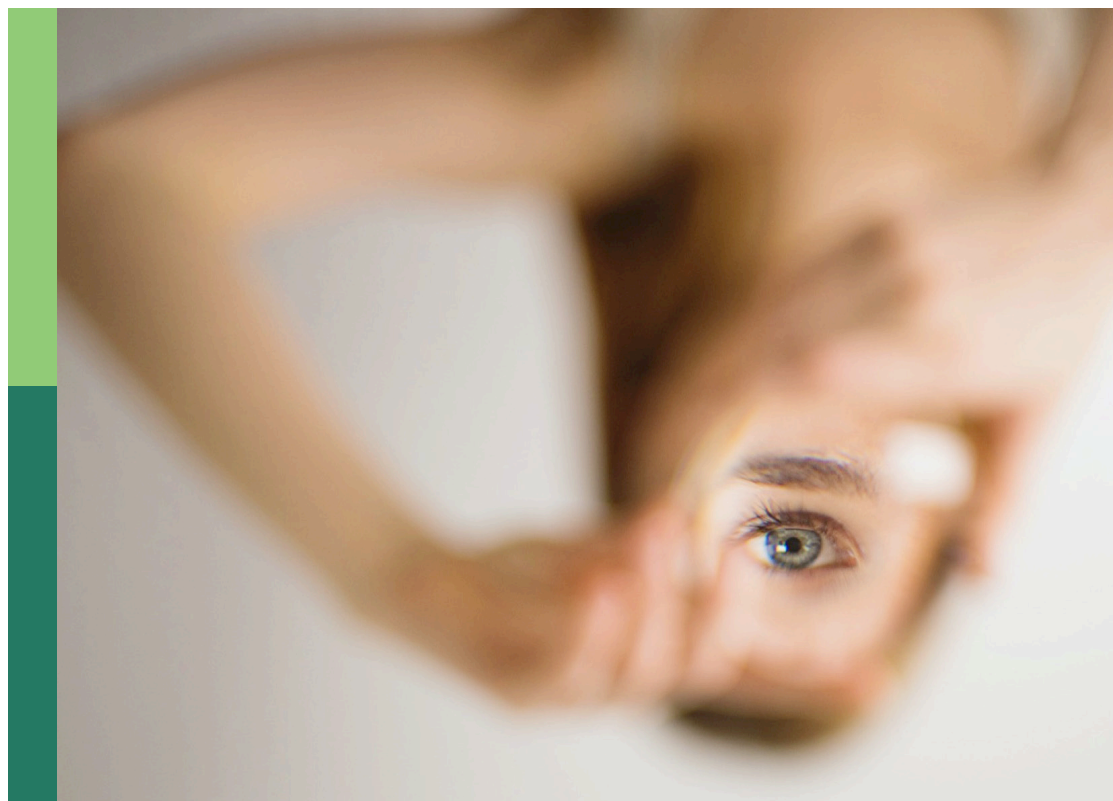# The roles of social media in education: Affective, behavioral, and cognitive dimensions

Edited by
Hung Phu Bui, Mark Bedoya Ulla, Chien Thang Pham
and Veronico N. Tarrayo

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The roles of social media in education: Affective, behavioral, and cognitive dimensions

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Editorial: The roles of social media in education: affective, behavioral, and cognitive dimensions

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Editorial on the Research Topic
The roles of social media in education: affective, behavioral, and cognitive dimensions

The interface between education and technology has become both inevitable and significant in today's digitally connected world. As a result, the current educational landscape is shifting toward using digital technologies for teaching and learning (Rautela, 2022). In higher education, for instance, an increasing number of teachers and students use social media for personal and educational purposes (Sabah, 2023). Education is undergoing tremendous modifications across academic disciplines, owing mainly to the integration of social media and web-based platforms (Chau and Bui, 2023). Within this context, educators are pushing boundaries, developing creative approaches, and analyzing outcomes across various teaching and learning situations, from Tencent Docs to Telegram and Instagram to Messenger. This Research Topic explores education in the age of social media, engaging in a discourse where traditional practices meet radical technological needs and trends. It looks deeply into technological shifts, analyzing the promises, successes, and issues that arise from integrating technology, particularly social media, into the ever-changing realm of education. The collected papers in this Research Topic provide a holistic understanding of current educational changes by covering affective, behavioral, and cognitive dimensions (Bui, 2023) and spanning areas such as writing, speaking, and grammar learning, as well as pertinent discussions on physical education, research, professional development, and assessment. Through the eyes of scholars, we examine a range of studies, from experimental interventions and empirical studies to insightful reviews, all with the goal of understanding how the digital age is transforming pedagogical approaches and student experiences.

As educators recognize the pervasiveness of social media in students' lives, research into its integration into English language teaching (ELT) has become critical to identify best practices and evaluate the effectiveness of social media use in supporting language learning. To exemplify, the growing research interest in incorporating social media into ELT highlights its potential to improve writing skills as educators use digital platforms to facilitate authentic writing experiences and immediate peer feedback for learners, as well as increase writing motivation. This Research Topic includes Y. Li's research that examined the impact of online collaborative writing instruction on Chinese English as a foreign language (EFL) students using Tencent Docs, focusing on writing performance, writing self-efficacy, and writing

motivation. Out of 58 participants, half used Tencent Docs for tasks outside the classroom (experimental group), while the other half followed traditional in-class instruction (control). Over 13 weeks, the group using Tencent Docs exhibited significantly improved writing performance, motivation, and self-efficacy compared to the control group. In a related research, Zhao and Yang explored the effects of a flipped course on Chinese EFL students' writing performance and anxiety levels using a quasi-experimental approach. Fifty students from two classes were divided into two groups: a traditional instruction group (control) and a flipped instruction group using social media (experimental). Two writing assignments and a writing anxiety scale were used to collect data. The results showed that the experimental group improved significantly at writing and reported less anxiety. Another experimental intervention was conducted in the study of Dai et al., which investigated the impact of wiki-based writing methods on Chinese EFL students' writing skills and self-efficacy. Fifty-three students from a language school in China participated and were divided into two groups: one using the wiki method (experimental) and the other using traditional teaching (control) over three months. Both groups were tested before and after the study using IELTS writing tasks and a writing self-efficacy scale. While both groups showed improvement, those taught using the wiki-based method had more significant gains in writing skills and confidence.

Similarly, scholarly interest in using social media to improve English speaking skills is growing, as its capacity to provide learners with real-world conversational experiences and increased confidence is recognized. Zhou's research explored how online language exchanges affect Chinese postgraduate students' speaking abilities and willingness to communicate (WTC) in an advanced English program. Two groups were compared: one using the Tandem app to converse with foreign English speakers (e-tandem), and the other having collaborative speaking tasks in class (conventional). Fifty-eight students were split between these groups. Data from IELTS speaking tests, a WTC scale, and semi-structured interviews showed that both groups improved their speaking skills. Yet, the e-tandem group excelled more than the conventional group. In a review, Fan delved into how digital-based flipped classrooms influence EFL learners' WTC and self-efficacy. The literature review revealed that social media and digital content can impact students' communication intentions in these classrooms. EFL learners in flipped classrooms demonstrated greater self-efficacy than in traditional settings. The analysis likewise provides insights for EFL educators, educational policymakers, and advisors on enhancing learner self-efficacy, WTC, and the benefits of the flipped learning approach.

Other relevant areas in language education, such as grammar learning, foreign language learning motivation, and the use of the flipped learning approach, were likewise covered in this issue. Teng et al. analyzed the effects of Instagram-feed-based tasks on EFL students' grammar learning. Eighty-four intermediate EFL students were divided into two groups: one received typical online lessons (control), and the other used Instagram-feed-based tasks (experimental). The results, analyzed using one-way ANCOVA, showed that the experimental group learned grammar more effectively than the control group. The findings emphasize the potential of Instagram-feed-based tasks in enhancing grammar

learning, and students expressed favorable views toward this method. On the other hand, Zhao et al. investigated the effect of Telegram on foreign language motivation, foreign language anxiety, and learning attitudes of 60 intermediate Iranian EFL students. These students were divided into two groups: one used the Telegram app (experimental), while the other learned traditionally without using social media (control). After 18 sessions, tests revealed that the experimental group had higher motivation, reduced foreign language anxiety, and a positive view of the app's role in their English learning.

In a conceptual review, Pang examined how a web-based flipped learning approach impacts learner engagement and critical thinking. Previous research highlighted the role of social media in fostering these skills and promoting collaborative learning and high-quality interactions, thus boosting student engagement. Furthermore, these platforms offer feedback and complex tasks, honing EFL learners' critical thinking. A corollary to this, Han's review analyzed the flipped classroom approach in language education, particularly its advantages and challenges when integrated with social media. The approach revolves around students accessing lecture content before class, using popular social media platforms for interactive learning. An analysis of 25 journal articles revealed that the flipped approach enhances learning outcomes, including motivation, attitude, course satisfaction, and self-efficacy in higher education. However, a significant challenge is students' unfamiliarity and difficulty adapting to this model. Focusing on an affective dimension in EFL learning, B. Li explored the potential of social networking to boost commitment and dedication in EFL students, providing valuable insights for language educators. By integrating social networking into educational platforms beyond the classroom, the conventional teaching approach is transformed. Social networking, a subset of social media, enables students to interact with peers through online and mobile platforms. This technology fosters a learning environment based on interactive dialog between students.

A few studies and conceptual reviews likewise have delved into the influence and use of social media in other facets of education, such as physical education, research, professional development, and assessment. Wang et al.'s review synthesized previous findings to discuss social media's role in student engagement both in in-class and online sessions. It likewise explored social media's impact on engagement, delved into engagement types, and examined the correlation between social media use and student engagement. In a related review, Chen and Xiao evaluated research on the impact of extensive social media use on students' emotional wellbeing. While positive and negative effects were noted, the latter, including symptoms such as depression, anxiety, and stress, were more prominent. The social comparison theory suggests that several issues stem from students comparing their lives to the unrealistic portrayal of others on social media. Thus, educators, policymakers, and school authorities may be informed about the potential psychological repercussions of pervasive social media use among students.

Moreover, Xu et al.'s work aimed to develop and validate the Social Media Perception Scale for future Physical Education teachers (SMPS-PPE). Data was gathered from 977 preservice physical education teachers using a survey. The data underwent

item analysis, exploratory factor analysis, and confirmatory factor analysis. The results indicated that SMPS-PPE is reliable in terms of content validity, internal structure validity, and internal consistency, and valid in evaluating the social media perceptions of these preservice teachers. Lu et al., on the other hand, looked into how novice EFL teachers in the Czech Republic view the use of social media tools, such as Web 2.0, and their willingness to employ them for collaboration in diverse classroom settings. One hundred teachers from various parts of the country participated in a survey and follow-up semi-structured interviews. The results showed that the teachers most open to integrating social Web 2.0 technologies had the most pronounced positive and negative views on them. The level of technology expertise, workload, and work environment influenced these views.

In the area of research, Alonzo and Oo employed autoethnography to analyze their three-year experience using Messenger for collaborative research, discussing the benefits and challenges of utilizing social media for academic collaboration. They showcased how a particular social media tool aided in enhancing their research output and obtaining a grant. The activity theory was used to discuss how various factors (i.e., personal, socio-emotional, structural, technological, and organizational) played a role in the success of their scholarly pursuits. On the other hand, Ping, in a review, explored the influence of teachers' commitment and identity on their use of social media in professional development (PD) for EFL instruction. Social media enhances teachers' dedication and professional identity (PI). Such PD helps teachers envision and shape a new identity through social media interactions. Since identity is fluid, participating in social media communities helps educators collaborate and connect, fostering their PD and professional success.

Lastly, in the area of assessment, Alonzo et al. utilized PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) to analyze 167 articles on the use of social media in educational assessments, finding only 17 relevant for detailed review. It revealed that Facebook and Twitter were the main platforms for assessment activities, including task sharing, monitoring progress, and offering feedback. The benefits included timely feedback and enhanced student performance. However, concerns emerged about assessment reliability, the constraints of social media tools, and balancing academic with social engagement.

The use of social media and digital platforms in education is no longer a budding trend; it is an essential component of modern pedagogy when harnessed with purpose and prudence. The scholarly works included in this Research Topic show both the transformative power of this integration and its potential challenges. While several educators and students have experienced significant improvements in areas such as writing, speaking, and learning motivation, there are evident concerns, such as the potential psychological consequences of excessive social media use. As the educational world merges with digital technology, educators, policymakers, and stakeholders should create a balanced approach to ensure that the benefits of technology are realized without compromising learners' holistic wellbeing.

Author contributions

HB: Conceptualization, Writing—review and editing. MU: Conceptualization, Writing—review and editing. VT: Conceptualization, Writing—review and editing. CP: Conceptualization, Writing—review and editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Revisiting English as a foreign language teachers' professional identity and commitment in social media-focused professional development

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These days, technology advancement has inspired a large number of educators to employ social media in the English as a foreign language (EFL) context. But, some EFL educators are yet unwilling to use such chances, because they are left untrained. Therefore, applying professional development (PD) in this field appears necessary as it is regarded as the main cause of improving educators' education activity, and proposing new education approaches. To strengthen the academic investment in educators' professional learning, comprehending elements affecting educators' performance of learning from PD is vital. Lower commitment degrees were specified as an element that impedes EFL educators from employing social media in EFL education. Moreover, developing the professional identity (PI) of educators is an important issue that straightly pertains to educators' performance, which assists educators both in comprehending their professional lives and presenting them with a framework to elucidate, expand and contemplate their professional activities. Stimulated by the interest in research on social media-focused courses, this review inspects how teachers' commitment and identity affect EFL teachers' implementation of social media in PD. In a nutshell, implications for stakeholders of the study are presented. Indeed, the social media as an impotent device should be incorporated in PD programs to develop both teachers' commitment and identity. Faculty members should establish workshops, and seminars to arrange for a platform for teachers to use social media to support learning.

KEYWORDS

professional development, social media focused, EFL education, commitment, teacher professional identity

Introduction

Discussing the pedagogical aspects of technology, van Braak (2001) asserts that the application of technology in educational contexts enhances learning, creating useful learning opportunities. These conditions make it easier for the students to learn regardless of time and place through social media which is a noteworthy technological facet that has become extensively employable in education (Kiedrowski et al., 2015). Dabbagh and Kitsantas (2012) define social media as a diversity of networked instruments or technologies that highlight the social facets of the Internet as a waterway for communication, cooperation, and resourceful appearance, and is often substitutable with the concept such as social software. EFL educators might utilize social media for teaching in various ways; for example, Hall et al. (2010) found that some educators utilized associative whiteboards to project material, while others utilized them to answer learners' questions. Emphasizing the utilization of the Web, Trentin (2008) determined various utilization trends among EFL educators: some utilize it to offer class information and educational content, some employ it to improve association and cooperation around class material or to build integral educational experience to substitute or supplement in-person teaching, and others utilized it to make educational contents to support personalized education or academic cycles to combine self-study with cooperative educational material-driven education. Social media has increasingly turned into a central facet in promoting professional development (PD) and emerging professional identity (PI) for teachers (Kimmons and Veletsianos, 2014). Social media assisted as a method to nurture learning through the comprehension of others' knowledge within a social community of peers (Sullivan et al., 2018). Teachers and educators have been using social media as a virtual learning tool both formally and informally for many years (Dutta, 2010). Indeed, social media along with its options have been found to pave the way for sustainable personal development and lifelong learning, which can be extended to all stages of life. Social media and relevant applications such as Ding talk, WeChat, and Tencent, are used as a platform that channels social capital, facilitating collaborations among people. These technologies can also be used to share teachers' ideas and resources in the context of L2 teaching and learning; that is, teachers in various regions can share their ideas regardless of geographical limitations.

In addition, teaching approaches and strategies have been growing with the incorporation of technology specifically social media, which is maintained to be the pattern for future EFL academics (Xiao et al., 2020; Huang, 2021). It is noteworthy that during the occurrences brought about by the COVID-19 pandemic in 2020; teaching combined with ICT instruments is included in all colleges in expanding the classroom beyond the conventional classes. Nonetheless, educators might have a hard time carrying out online teaching due to the contrast of basic associations with in-person classrooms and the absence of knowledge and abilities preparation (Kohnke and Moorhouse, 2020). Language teachers need professional knowledge such as knowledge of language employed in syllabus perspectives, knowledge of language learning principles, knowledge of educational and evaluation and skills in the administration of the social facets of working with students, and such professional knowledge requires updating issues (Meng and Tajaroensuk, 2013). According to Gaytan and McEwen (2010), these attempts are mainly aimed at enabling teachers to effectively incorporate instructional social media into their teaching activities. Therefore, EFL teachers need to acquire the ability to create active learning settings where learning is enhanced. Given the emphasis put by countries on the knowledge economy in the twenty first century, which attaches enormous importance to creativity and change, some new challenges emerge regarding the difficulties faced by educators in their dealing with social media, as well as their PD (Mâță, 2014; Yurtseven Avci et al., 2020). Wherein this aids educators to achieve a primary degree of usage, they desire to take part in training based on the curriculum that allows them to merge social media into their current curriculum (Luo et al., 2020). Yet, given some issues including time and cost, as pointed out by Kiedrowski et al. (2015), PD programs currently offered to teachers are far inadequate, particularly, concerning the use of social media. Some investigations have confirmed the necessity of providing additional PD for teachers regarding how to effectively apply emerging social media in their classroom (Kiedrowski et al., 2015).

Indeed, researchers consider PD as a pillar of educational reforms, which plays a pivotal role in enhancing learners' achievement and engagement (Wei et al., 2010). PD goes a long way to enhance and develop teaching practices in the content areas, helping the teachers to gain a better understanding of assessment following standards, and using new tools and strategies in an innovative manner (Lawless and Pellegrino, 2007). PD brings about new information and opportunities to teachers thereby they embark on integrating technology into the classroom and can grasp how social media is associated with the curriculum (Tweed, 2013; Alberth et al., 2018).

Accordingly, research should focus on different dimensions of teacher education, along with the concepts associated with teaching (e.g., teacher cognition and teacher knowledge). Teachers' PI or how EFL teachers view their professional roles plays an important role in making teaching effective (Pishghadam et al., 2019; Coombe, 2020). The notion of identity has been the focus of many disciplines and subdisciplines, including social psychology, history, and sociolinguistics, among others. Indeed, identity enjoys a special status in L2 education (Preece, 2016). Indeed, teaching is among the careers in which identity has an important function, and educators can learn how to employ expertise to build the domain of their PI by acting to affect the whole school (Beijaard et al., 2004).

EFL Teachers' identity comes into play when they are pushed to adopt new teaching practices. Such uncertainty may lead to perceived risk and lower teaching efficacy, which can bring about reduced motivation. This may induce a negative mentality and experience regarding using social media on the part of the teacher (Van Veen et al., 2005). In recent years, EFL educators and scholars have attached enormous importance to teachers' PI and have emphasized its role in teacher education that is described regarding a specific complexity of one's features assumed in contrast to that of different people (Pennington and Richards, 2016). That is, PI is a social construct that is manifested in the form of increased motivation, satisfaction with one's job, perceived self-efficacy, and loyalty to one's occupation, among others (Canrinus et al., 2012). PI plays a pivotal role in how EFL teachers make sense of their behaviors, and in how to act and grasp their work. Therefore, it might impact how teachers perceive the integration of social media in their teaching activities, as well (Seaman and Tinti-Kane, 2013; Badia and Iglesias, 2019; Liu et al., 2020). Indeed, educators' PI refers to a central component of educators' professional lives, which has an extensive influence on an educators' education, PD, and so on, which affects personal education powers by affecting their real behavior within the education process (Derakhshan, 2022). A significant issue consistent with educators' identity is commitment, which alludes to the fact that educational levels have gained significant vital consideration. Managing the educational section requires a higher educator's professional commitment, defined as an affiliation, relation, and settlement of the place of work and liabilities to perform the assignments and tasks (Zhang et al., 2021). Zhang et al. (2021) argued that EFL teachers who had a high level of commitment to teaching have been found to integrate social media tools more willingly. Simultaneously, partaking in PD activities can help to improve commitment by assisting educators to develop their abilities and knowledge (Smith, 2005). Consistent with Park (2007), teachers with a great level of commitment to their job deal with high job fulfillment and identify themselves with the work of being an educator.

The application of social media to enhance personal development is in keeping with the current learning theory (e.g., Social Constructivism) (Felix, 2005). Following Social Constructivist Theory, learning is viewed as a social activity. This also applies to teachers, as well. Traditionally, teaching underestimated the collaboration among teachers, paying no attention to the important role of ideas and experience sharing among teachers. In recent years, social media has emerged as a tool to facilitate social interaction among learners and teachers. Using such technology, they can also share their teaching experience and resources, which plays a critical role in the personal development of teachers (Holmes et al., 2013). Although teachers are expected to take part in social media-focused PD tasks, they are often provided with no opportunity to select and plan the related activities

as they are not trained in this domain. As a result, there may be no close ties between tasks and classroom practice, which results in a lack of commitment. Accordingly, the enhancement of PD plays a vital role in alleviating this problem, with multiple factors including teacher commitment and identity. A review of the literature shows an increasing recognition of the positive outcomes and benefits emanating from the social media-oriented programs for teachers' PD. Some of these benefits include a notable decrease in teacher isolation and established PI (McLoughlin and Lee, 2010). Therefore, the study of factors such as teacher commitment and identity are deemed highly important in this regard for the reason that these factors assist the student teachers with learning how to teach and what it means to be a teacher (White and Lemieux, 2015). Recently, there has been an emergent concern in studying the PI of EFL teachers (Gu and Lai, 2019; Nguyen and Dao, 2019; Widodo et al., 2020). Regardless of the significance of social media in supporting PD (Heidari et al., 2020; Mart and Campbell-Barr, 2020), little is acknowledged about how a social media platform cares about English teachers' PI. Indeed, based on the researcher's knowledge, no studies have been done so far to take the role of both constructs, namely teachers' PI and commitment in social media-focused PD since the significance of the issues includes facilitating teaching through informal learning settings, such as social media and beyond technology focused domain.

Review of the literature

Teachers' professional identity

As for the instructional contexts, identity is described by Pennington (2015) as an impression and mental picture of what "being a teacher" means. This internal model determines teachers' performance as they seek to put to practice such a mental model of being a teacher through specific "acts of teacher identity (Derakhshan and Nazari, 2022). L2 teachers take on several identities as they change their roles in social interaction. They come into contact with many players during this engagement (e.g., parents, students, colleagues, managers, public community, etc.). These roles are also influenced by arrangements, places, and objects in classrooms and institutions (Barkhuizen, 2016). Description of PI includes a relatively steady collection of features, views, values, incentives, experiences, and connections allowing people to describe their expert function (Dobrow and Higgins, 2005). As a dynamic concept, PI influences how a teacher behaves in the classroom. It also determines the efficacy of their teaching, as well as their perception of wellbeing. Moreover, PI impacts teachers" PD, enabling them to cope with educational changes. This, in turn,

contributes to their motivation and creativity in their teaching (Abednia, 2012). Forming educators' PI is a procedure of narrating and associating several I-positions and it is shaped in the path of self-participation as well as self-involvement and within the route of attempting to preserve consistency and continuity (Akkerman and Meijer, 2011). Currently, a large number of researchers have studied the notion of EFL educator identity (e.g., Mora et al., 2014; Ghanizadeh and Ostad, 2016; Labbaf et al., 2019). PI of educators includes inner and outer elements like educators' individual life experiences, viewpoint on teaching, individual values and anticipations for the future, and educators' connection with colleagues, career setting redesign, institutional framework, and the execution of teaching, academic improvement, school leadership, and PD (Kao and Lin, 2015).

The following roles have been identified by Beijaard et al. (2000) as three important aspects of PI: (a) teachers serving as professionals who have expertise in the subject matter. (b) Teachers serving as professionals who enjoy didactical expertise. (c) Teachers serving as pedagogical professionals. Indeed, teachers' PI is a multifaceted, complicated, and changing procedure, during which several elements affect whether or not beginner educators pick to be passive or active (Kayi-Aydar, 2019). As teachers absorb identity positions, they might be discouraged and encouraged between their demands and selections and the cultural aspects in their setting (Dikilitas and Yayli, 2018). Zare-ee and Ghasedi (2014) presented the notion that educator PI is the way educators characterize their expert functions and combine them with individual functions influenced by elements inside and outside the class. Educator PI is developed based on how educators explain their career and how it is associated with other dimensions of their lives. Nevertheless, it has been decided that function and identity, i.e., practice and the center of teaching, are intertwined and frame educator growth together (Walkington, 2005). Teacher PI is mainly a functioning identity, which involves educators' discernment of the various dimensions of educators' function in the teaching career and is how educators view their career, give meaning to it, and play a role in it (Brenner et al., 2018). Hapsari et al. (2022) have done a study to investigate the role of LinkedIn-mediated activity shapes pre-service English teachers' PI and to investigate the perceptions of pre-service English teachers on their participation in LinkedIn-mediated early PD activities. The findings revealed that LinkedIn-mediated early PD activities that raise awareness on developing the current professional digital footprint. According to Heidari et al. (2020), the use of online social networks in the context of higher education allows learners to enhance their professional identities by taking on the role of a mediator.

Teacher commitment

Commitment is described as a driving force that shapes behaviors through constraining freedom and forcing people to follow a course of action in the face of conflicting reasons and demeanors (Meyer and Herscovitch, 2001). Commitment has to do with a demeanor or mental state that accounts for how a worker engages with his/her boss. This engagement eventually impacts whether or not he/she will be loyal to the institution (Meyer and Herscovitch, 2001). As for commitment in the school or university, one can say that scholastic commitment concerns the mutual associations between several elements, including psychological, relational, and surrounding (Human-Vogel, 2013). Commitment involves continuous engagement between several elements (e.g., individual, professional, and academic) (Choi and Tang, 2009). Given such a continuous interaction, some commitments take on more important roles than others in different circumstances. The outcomes resulting from various forces in one's life determine the extent to which these commitments are strong (Choi and Tang, 2009). Teacher commitment refers to the extent to which he/she is willing to teach, playing an important role in teachers' successful performance (Day, 2008) and such a type of commitment is necessary for effective instruction as it pushes the teachers to proceed with their profession. Teacher commitment is indicative of educators' perceived loyalty to the organization where they work. Such a commitment has been found to predict learning and mental results (Day, 2008). Observations show that committed educators can contribute to creating an environment where learners are energetic and motivated by encouraging the learners to follow up on their exercises. Such a type of commitment is a requirement for effective teaching, as it involves being committed to students, the school, vocational success, proficient knowledge, and the teaching profession (Crosswell and Elliott, 2004). Engaging in interaction with students and paving the way for their growth are appealing to committed teachers. These teachers seek to promote their educational proficiency by using several methodologies. Consequently, education would fail if teachers lacked enthusiasm. Highly committed teachers find teaching very appealing (Choi and Tang, 2009). Teachers' commitment to their teaching affords them both the chances of PD, helps them involve learners, and provides numerous tactics and learning models that outfit learners' situations (Asiyah et al., 2021). Also, PD tasks have the prospective to serve as association-building activities that have a constructive effect on teachers' commitment. Teachers' commitment being an inner issue of educators' performance indicated how their commitment was crucial to their presentation as there was a robust association between learning and teacher work commitment that is taken into consideration in PD activities (Asiyah et al., 2021).

Professional development

As a context-specific phenomenon, PD is a continuous effort guided by standards, manifested inside the pedagogical activities, focuses on students' learning, and is tailored to educators' levels of career growth. The PD programs seek to enhance educational quality as it is an essential component of learning (Schlager and Fusco, 2003). PD is characterized as actions that have the objective of improving expert development (Goh and Loh, 2013), thereby assisting educators with comprehending teaching and educational cycles better and elevating their awareness of their students (Darling-Hammond and McLaughlin, 2011). PD can also be characterized as constantly building educators' knowledge and expert abilities throughout their academic profession, during which professional educator identity is formed and theoretical knowledge is changed into practice (Kuijpers et al., 2010). The PD aims at increasing educators' quality because it is a vital component of learning (Geringer, 2003). Engaged in learning, educators come to show cooperation, thoughtfulness, and eagerness for spotting and solving problems related to education and learning. Furthermore, the emphasis of PD is on the long-run development of educators and is a dynamic, practice-centric, and continuous cycle that combines teaching practices and PD actions (Hos and Topal, 2013). Moreover, PD has to do with educators' learning, paving the way for them to put to use their knowledge for the sake of learners' growth (Avalos, 2011). PD can play an important role in improving tasks. Undoubtedly, sticking to the goals set by the educators, as well as the local standards, or the learners' evaluation (individual and collective) can contribute to enhancing the PD in the best way (Colbert et al., 2008). Thanks to PD, people internalize their knowledge and skills related to their job, which may surface in various shapes (e.g., formal educational classes to gaining experiential learning through daily activities); however, PD commonly refers to the enhancement of professional knowledge by engaging in short formal courses offered through working teams (Collin et al., 2012).

Social media

The majority of social media encompass references to "internet-based" or "online" communication such as micro-blogs, blogs, and social network websites. The other significant component describing the term refers to sharing data employing "basically net or mobile-based apps" or, more generally, "formats of e-communicating" permitting it. The term is highly ambiguous, such that it is primarily employed nowadays to define roughly any sites on the internet," considering that even conventional media may occasionally be taken into account social media as "the border drawn between both

is gradually narrowing as both keep on evolving (Nations, 2017). Several reasons exist why social media is recommended to assist the occupational expansion of educators within intercontinental schools. In fact, they can be easily employed and are omnipresent, therefore, are needless of education that permits individuals to communicate with people with identical hobbies, tasks, history, or in-person relationships and offer a virtual environment for learning (Srivastava, 2012). Social media proposes a low-cost platform for the construction of a PI or personal brand, connecting who an individual is within and outside his corporation (Dutta, 2010). Booth (2012) believes that these learning settings offer an internet-based output to assist personalized, related, occupational learning and provide access to sources with no location or monetary constraints. In addition, using such instruments may help educators have lower feelings of isolation (Visser et al., 2014). Social media assimilated to other approaches that care about PD tasks for online capability, comprising explanation of formal prospects and personnel provision (Coswatte Mohr and Shelton, 2017). It may ease educators' required source of exchange. Since educators select PD for new opinions and tactics following their material areas and class learning goals (McCray, 2018), searching for the resource is a major reason for educators' employment of social media for PD (Hunter and Hall, 2018). Internet-based, educators can gain access to a large extent of sources; however, educators take into account social media as a confident resource for the majority of updated activities and tactics (Krutka and Carpenter, 2016; Trust et al., 2016). In other words, teachers develop professionally when they are afforded opportunities to engage as learners in collaborative settings, for example, through the collective construction of pedagogical knowledge, the creation of new instructional practices or the presentation of optimal solutions to classroom issues. All these activities, underpinned by reflective dialogue, can be facilitated by modern technology, and this is where blogging comes into play (Cirocki and Farrell, 2017). Secondly, social media may ease educators' social construction. Outside the amount and quality of sources gained in social media, educators employ social media to satisfy their social and affective requirements as well.

Given the contribution of social media to the personal development of teachers, investigations have been carried out on the potential role played by social media in PD. As an example, Holmes et al. (2013) examined the effects of Twitter on teacher PD. The findings showed that the social networking site was a useful tool through which students can access both instructive educational resources and social support. The study reached the conclusion that Twitter can be used as a versatile resource for sustainable teacher PD. In the same vein, Jenkins et al. (2009) found out that Twitter makes it possible for pre-service teachers to keep in contact with practicing teachers by helping them to share their ideas and discussions. This helps the pre-service teachers to practice in the field; moreover, social

networking site also allows teachers to keep track of their own PD (Risser, 2013). Qi and Wang (2018) proved the use of WeChat as a social media platform for language teachers' PD. Carpenter (2015) conducted a study to explore the application of Twitter among preservice teachers. The findings revealed that most participants perceived the positive role of Twitter in education, expressing their desire to use the platform for their future professional purposes. In the same vein, Xue et al. (2021) examined the way some teachers in China resorted to WeChat to create an online Community of Practice for purpose of fostering their professional learning. To this end, they benefitted from mobile technology-enhanced teaching. The findings showed that engaging in the teacher group activities enhanced the teachers' professional knowledge, leading to a noticeable improvement in their teaching practices.

The interrelation among teachers' professional identity, commitment, and social media-focused professional development

The social media-focused PD platform focuses on an extensive range of positioned, social, and distributed learning chances for language principals while distorting the lines between formal and informal PD. With the emergence of social media, the customary learning societies that were initially prearranged as offline formal PD inventiveness may develop into massively circulated online learning. This can nurture significant modifications in a principal's education and learning performance (Gruzd et al., 2012). Taking part in social media-focused PD can help teachers as it triggers their commitment. Indeed, their commitment is nurtured to the extent to which the teaching occupation is delivered to teachers through social media and it brings about success in their PD and progress. Using social media for PD is a spontaneously accessible technological source that is universal and appropriate; therefore, teachers can commit in PD during times outside of arranged classroom teaching in a setting of their choice. PI is a central issue in teacher growth, attrition, and career gratification (Hong et al., 2018) and social media provide prospects for teachers to interact that can help their PI development (Carpenter, 2015). Teacher PI is a principal issue in present conceptualizations of PD as it assists to capture the way teachers cultivate modified considerations that regulate their involvement and also root the teachers in a diversity of socio-cultural and official discriminations (Beijaard, 2019). Undoubtedly, identity is so dominant to teacher PD that Beijaard (2019) insistently identified that "teacher learning, consequently, can and should be conceptualized as teacher identity learning" (p. 1). Reflecting on teachers about the identities they have when cooperating in a

social media-focused context can be supportive of their commitment. Moreover, identity has been defined as the involvement in "borderland discourses" whereby a teacher will promote their practiced self by getting on their particular principles, classroom performance, and PD capabilities (Alsup, 2006).

Conclusion

As a central component of any academic improvement, educators must be expertly well-prepared to carry out any improvement successfully and deal with present difficulties in teaching and educational cycles (Dayoub and Bashiruddin, 2012). Nonetheless, they must do it "innovatively" to assist in bringing about actual alterations in educator practice and enhancing learners' success (Gulamhussein, 2013). As individuals increase their use of social media and the settings in which they live and work, they can create and frequently change their identity over time concerning the new people and collections that they cooperate with others and the new functions they accept in the situation of the action. The implementation of social media for PD is without a doubt a contemporary occurrence expedited by improvements in technology. Language teachers' use of social media in teaching activities through PD tasks means that these teachers are highly dedicated to their profession, which shows they are intrinsically motivated to carry out any type of task they are asked for. These EFL teachers have even more motivation when they deal with performing demanding tasks since the challenging aspect of the task leads to the highest level of commitment and intrinsic motivation (Deci and Ryan, 2016). In this way, the use of social media-based PD activities enhances EFL teachers' commitment by providing them with an opportunity to promote their skills and core content knowledge. It can be determined that PD is likely to enhance teacher commitment by strengthening their perception of efficacy, improving their motivation and freshness, and satisfying their perceived need for growth (Hausman and Goldring, 2001).

Besides, educators' PI impacts the way they understand and respond to information during their learning and when participating in educator readiness programs and while taking part in PD in the process of teaching (Luehmann and Tinelli, 2008). Moreover, thinking about educators' PI provides language teachers a beneficial lens into ways of education and how they build and rebuild their perspectives of their roles as language educators regarding their mates and the setting that it helps them to actively get involved in the preparation of content, trying to incorporate what they learn into their teaching that can also reinforce EFL teachers' commitment to teaching. Viewed from this perspective, teacher PD contributes to teacher professionalism, which could impact their commitment

positively and can also increase the likelihood of their retention in school and their profession.

It can be concluded that the social media-focused PD contributes to the beneficial and positive development of EFL teachers' PI since the social media-focused PD programs increase the EFL teachers' motivation for integrating what they gain from the programs into their teaching. Undeniably, teachers establish the imagined identity through engaging in social media-focused activities that in turn, result in the establishment of a new identity. EFL teachers' involvement, interaction, and negotiation in social media-focused communities may push them to construct and reconstruct their PI. Because identity is a variable construct, educators' PI is built and expanded step by step due to participation in a social media-based society which provides them a basis for socializing and cooperating with other educators to nurture their PD that bring about success in the profession.

Implications and suggestions for further research

Technology is regarded as an essential element of teaching and learning that has the capability to support learners' achievement so enlightening technology integration through social media in language learning depends on the growth of robust, comprehensible PD programs that are planned with a strong comprehension of how EFL teachers employ social media. On the basis of this review, one can refer to the significance of social media as an instrument to be incorporated in PD programs while implementing it in the classes needs teachers' commitment. Sufficient PD for EFL educators regarding the use of social media in their classroom can assist them to apply tactics that also enhance their success. Successfully using social media in classes happens merely while pre-service educators consider social media usage modeling within the overall preparation and gain possibilities to learn and employ social media in instructional environments that can be done through PD.

Moreover, this review has practical implications which allude to PD because educators attempt to ease learning by merging social media which requires educators' PI and commitment for its development. As a result, educators' consciousness of their commitments and identities can be taken into account as critical elements in PD, as it can be also useful in their overall improvement. It is crucial to enhance educator recognition of the important function of educators' PI and commitment to their career and the elements that build it. Experienced educators must also be aware of the fundamental prompts of alteration in their PI and assist novice educators with having a good comprehension regarding it and its development from the beginning. Colleges

need to equip educators with competencies to apply social media and also assist educators in converting how they consider education as a job and how an educator should be practically educated. PD programs are required to encompass different choices wherein educators are provided with the opportunity to experience learning from some instruments and tactics simultaneously, to completely experience the limitations and affordances of each of them. Beyond learning how to employ specific digital tools, assets, and social media, teacher training databases, colleges and policymakers must arrange for suitable care to the educators through their identity development as their PI has a noteworthy effect on their confidence, presentation, in addition to their educational selections.

The present research can also be used by educator trainers engaged in programs of pre-service and in-service educator instruction. They can specify educators' weak points and powers from their perspective regarding the degree of commitment and educators' PI by holding debate forums to provide them with several classes and programs. Indeed, based on the research review, EFL teachers' commitment to the use of social media in L2 pedagogy increases through their engagement in the social media-focused teacher preparation programs. Moreover, teacher educators can provide teachers with numerous PD opportunities to better understand and experience the use of social media. Technology integration through social media in this domain can be useful for both teachers, who should use such tools in the classroom, and for teacher educators, who do well to make use of social media to draw on teachers' previous knowledge and strengths. By employing social media, educators may cooperate and exchange opinions regarding educational activities with both local educators with identical expertise, and with those from outspread academic professionals from various sections of the world (Trust, 2012). Using social media, educators can react to opinions at a suitable time. This social and expert interplay and exchanging comments assists educators think about their educational activity for exposure to new opinions and viewpoints, therefore enhancing their educational activity. Educators employing the technologies of social media to improve their own technical information and expert growth can better teach learners to efficiently and ethically employ them (Trust, 2012).

It can also be used by syllabus designers, who are able to gain a new understanding of how teachers come to view the role of such tools in their teaching activities. Moreover, EFL teachers should be helped in their attempts to lay out a lesson plan that merges such equipment and tactics into their particular material, and this assistance should be consistent as they apply the instruments and tactics practically with learners. Academic supervisors, managers, and those accountable for the TPD growth in schools have to understand the possibility of internet-based expert growth nets to increase conventional types of

educator PD. Presenting workshops on the significance of active learning totally *via* social media tools slightly allows educators to enjoy how a learner-oriented task can make contributions to learning or provide them with the experience of selecting and applying the suitable tactic or instrument for their class.

Considering the multifaceted and hierarchical nature of higher education educators' PI, future empirical studies may be carried out to search dimensions of PI that synergistically work with educators' learning social media integration; how PI is changed through time in the social media setting; and how colleges can ease the PI rebuilding procedure. Qualitative studies can be conducted in this domain through the interview as the results of the interview can show the identity and its effect on educators and it can reveal how it feels to be an educator in academic environments nowadays and resolve arguments between the individuals and the setting where they live. The current investigation into teacher identities is a vigorous instrument for encouraging a superior indulgence of the teaching profession and their roles in diverse circumstances and times. Additional research should be done to explore how educators' experience in implementing social media might form their forthcoming education and identities.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Mobile assisted language learning in learning English through social networking tools: An account of Instagram feed-based tasks on learning grammar and attitude among English as a foreign language learners

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Advancement of social media in the modern era provides a good incentive for researchers to unleash the potential of social networking (SN) tools in order to improve education. Despite the significant role of social media in affecting second/foreign language (L2) learning processes, few empirical studies have tried to find out how Instagram feed-based tasks affect learning grammar structure. To fill this lacuna of research, the current study set forth to delve into the influence of Instagram feed-based tasks on learning grammar among English as a foreign language (EFL) learners. In so doing, a sample of 84 intermediate EFL learners were randomly divided into experimental and control groups. The learners in the control group received regular online instruction via webinar platforms. In contrast, the learners in the experimental group were exposed to Instagram feed-based tasks. Data inspection applying one-way ANCOVA indicated that the learners in the experimental group outperformed their counterparts in the control group. The results highlighted the significant contributions of Instagram feed-based tasks in fostering learning grammar. Furthermore, EFL learners' positive attitudes toward using Instagram Feed-based Tasks in Learning Grammar was

concluded. The implications of this study may redound to the benefits of language learners, teachers, curriculum designers, as well as policy makers in providing opportunities for further practice of Instagram feed-based tasks in language learning and teaching.

Introduction

Rapid development in technology calls for more innovative teaching and learning techniques. In the past half-century, the research on Social Networking (SN) has blossomed, particularly during the COVID-19 Pandemic Crisis, leading to the near-total closures of schools and minimal relationships among people. The COVID-19 pandemic has disrupted education in many countries; thus, as an emergent response, many countries focused on implementing remote learning modalities. Meaningful two-way interaction between students and their teachers during COVID-19 pandemic was mostly solved via online programs and social media (Shadiev and Yang, 2020; Kamasak et al., 2021; Li et al., 2021; Lei et al., 2022). Aside online programming, Mobile-Assisted Language Learning (MALL) in learning English through SN tools excited special attention in recent years.

Social media language learning is a method of language acquisition that uses socially constructed Web 2.0 platforms to facilitate learning of the target language. SN tools as computer aided web-based tools, support communication, collaboration, and information sharing. SN through MALL-oriented applications opens new perspectives in language learning (Navarro-pablo et al., 2019; Woods, 2020; Liu et al., 2021). The concept of MALL can be defined as a mixture of digital technology with language learning (Crompton and Burke, 2018; Ahmadi and Tabatabaei, 2021; Kamasak et al., 2021; Lei et al., 2022). MALL has evolved to support Students' language learning through activities to be performed on mobile devices at anytime and anywhere (Gonulal, 2019; Wrigglesworth, 2019; Zai, 2021). During the Covid 19 Pandemic, social media complement the teaching-learning process and created an avenue for sharing educational contents, interaction, and communication.

In line with this flourishing interest in the usage of social media, different studies have been conducted to demonstrate the influence of social media platforms on education, especially in the field of foreign language teaching and learning (e.g., Krutka and Carpenter, 2016; Taskiran et al., 2016; Vivakaran and Neelamalar, 2018; Maulina et al., 2021). Among social media platforms, Instagram has attracted great attention in recent years (e.g., Erarslan, 2019; Gonulal, 2019;

Lailiyah and Setiyaningsih, 2020). Instagram bestowed online communities for sharing knowledge and promoting learning. It can offer innovative ways of learning, which is part of the interest of this generation of learners, as digital natives (Erarslan, 2019). Instagram can be used as a source of a number of activities in language classrooms such as digital storytelling, grammar activities through photos, role plays, reading, speaking activities through videos (Handayani, 2016; Devana and Afifah, 2021). Soviyah and Etikaningsih (2018) asserted that Instagram can influence learners' autonomy, motivation, self-assessment, group working, and academic achievement. Although Instagram is one of the most popular social media platforms, its efficiency for language learning purposes, in particular learning grammar has not been studied in detail, and the review of the existing literature implied that there is ample room for future studies. Keeping these standpoints in mind, this study sought to shed more light on the realm of technology-based instruction by exploring the possible influence of Instagram feed-based tasks on learning grammar among EFL university learners. Furthermore, EFL university learners' attitudes toward learning grammar via Instagram feed-based tasks was the target of this research. Aiming to fill the existing gap in the literature, this study seeks to answer the following research question:

RQ1. Do Instagram Feed-based Tasks influence Learning Grammar among EFL Learners?

RQ2. What are EFL learners' perceptions toward using Instagram Feed-based Tasks in Learning Grammar?

Literature review

The relevant literature on social media, MALL, and Instagram, as well as their efficacy in education, are reviewed in this section.

Social media and education

The emergence of the Internet opens a new horizon for technologies of communication and information sharing. This situation was the triggering step for the birth of social media.

The need for an affordable, portable, and accessible information and communication technology (ICT) tool gave birth to social media. According to Manning (2014), two ages are considered for the development of media: the broadcast age and the interactive age. The broadcast age focused on one entity (e.g., a radio or television station and newspaper company) designed to distribute messages to many people. They possess indirect, delayed, and impersonal feedback. Furthermore, the mediated communication between individuals is limited. Contrarily, social media refer to new forms of media that evolve around interactivity. Prompt and direct feedback is also possible through social media (Manning, 2014; Vadivel et al., 2021).

According to Manca (2020), social media is internet-based applications for sharing images (e.g., Instagram), information organization (e.g., Pinterest), photo or video messaging (e.g., Skype), instant messaging (e.g., WhatsApp), or a combination of all (e.g., Facebook). From a similar perspective, Grahl (2013) divided social media into six different but overlapping categories as follows: (1) social networks (e.g., Facebook, LinkedIn); (2) bookmarking sites (e.g., Delicious, StumbleUpon); (3) social news (e.g., Digg, Reddit); (4) media sharing (e.g., Instagram, YouTube, Flickr); (5) microblogging (e.g., Twitter); and (6) blogging, particularly comments, and forums. The affordability, portability, and accessibility of social media made is widespread around the world very soon. Their massive popularity has attracted the attention of many educators to investigate their pedagogical affordances, and language instruction was not an exception.

Social media platforms revolutionized language teaching and learning; they provided a socially engaging learning atmosphere (Vadivel and Beena, 2019; Manca, 2020; Ahmadi and Tabatabaei, 2021; Rasyiid et al., 2021). More importantly, social media platforms are flexible; that is, they can be used across all educational settings (e.g., K-12 and higher education) as well as formal and informal learning contexts (e.g., Barrot, 2021). The two dimensions of formality and informality of social media and how to make a distinction between them are in question among educationalists. Some argue that these two dimensions are in a continuum (e.g., Sefton-Green, 2004) contrarily others consider them binary (e.g., Eshach, 2007). In a recent attempt, Manca and Ranieri (2016) as well as Greenhow and Lewin (2016), discussed that this distinction should be conceived as interconnected and as a continuum.

Adoption of social media in the educational context is theoretically supported by Technology Acceptance Model (TAM), which highlights the external variables that could foster the appliance of technology (e.g., social media), which in consequence, influences the learners' attitudes toward learning (Davis, 1989; Namaziandost et al., 2021). A plethora of studies has shed light on the contributions of social media to Students' wellbeing. For instance, Dizon (2016) conducted a quasi-experimental study to investigate the usefulness of Facebook in fostering the writing fluency of EFL learners. The ultimate findings of this study confirmed the efficacy of Facebook in promoting second language writing. In a mixed-method study, Students' perceptions of WeChat as a language learning tool were explored at a Chinese university by Zou et al. (2018). Based on their outcomes, the integration of WeChat into language instruction leads to the learners' progress. In the same line of inquiry, Lenkaitis (2020) employed Zoom (videoconferencing platform) to explore its efficacy in language learning and learner autonomy. This study provides evidence of the effectiveness of videoconferencing activities with tools like Zoom in fostering language learning and increasing learners' autonomy.

Mobile assisted language learning and education

Over recent years, mobile device technology has been developed very quickly. Besides oral communication, which is the main aim of designing the mobile phones, recent changes in mobile device technology define various functions for them. With the use of the internet, the users are enabled to access the internet to search for information, email, read e-books, and shop irrespective of time and place (Pachler et al., 2010). The integration of mobile device technology into teaching and learning was introduced as mobile assisted language learning (MALL), which is defined as a specialization of mobile learning (m-Learning) and a branch of computer-assisted language learning (CALL) (Kukulska-Hulme and Shield, 2008; Li et al., 2020; Namaziandost et al., 2020). According to Huang et al. (2012), mobile technologies have many positive advantages: flexibility, low cost, small size, and user-friendliness, to name a few.

Despite the rapid evolution of MALL, no agreed-upon definition exists for this concept. As Palalas (2011) viewed m-learning as an active process using mobile technologies that empower students to access, create, and share knowledge together. From a similar perspective, m-learning is defined as learning across locations and contexts with the help of mobile technologies (Crompton, 2014). Moreover, no direct and field-specific theory was raised to capture MALL. The existing theories were borrowed from other fields. For example, Applied Cognitive Load Theory (Oberg and Daniels, 2013), and Dual-Coding Theory (Delprato, 2009) were originated from the cognitive psychology and TAM (Cheng et al., 2010) was formulated based on informatics research. The Theory of m-Learning postulated by Sharples et al. (2007) could demonstrate and justify the applicability of m-Learning across locations, times, topics, and technologies.

Several studies were conducted to touch on the issue of MALL from different perspectives and other contexts. For example, Chen (2013) explored the influence of employing a Tablet PC for informal learning of English outside of the classroom setting. The results of this study revealed that a Tablet

PC could foster the learning of English a great deal. In another study, Chien (2016) demonstrated that m-learning raises self-dependent and self-motivated learners. Similarly, Zou et al. (2020) concluded that collaborative approaches in m-Learning enhance learning. Considering vocabulary learning, the study of Zhang and Pérez-Paredes (2021) was evidence of using vocabulary learning applications and improving vocabulary acquisition. In the same vein, Chen and Jia (2020) concluded that MALL enhances learning because they are designed based on learners' need analysis and pedagogic goals.

Instagram and education

The appearance of Instagram dates back to 2010 with photo sharing platform, and over the years, other enhancements such as texting, video, and story sharing has been added (Ellison, 2017). Instagram is a mobile application that provides users the opportunity to take instant snapshots of images, current activities, upload pictures, text messaging, and posting videos (Chen, 2021). As Salomon (2013) argues, Instagram is a type of digital literacy enhancing the teaching and learning process. Instagram proposes different contextualized visual information, socially associated network of learners, as well as comment and tagging feature (Chen, 2021) to be directed and used in language teaching and learning. Furthermore, Shazali et al. (2019) expressed that learning time can be expanded productively via suggested activities on Instagram. The mobility and accessibility of Instagram make dynamic language exposure (Al-Ali, 2014), which is necessary for successful language learning.

Recent approaches to teaching language skills reported successful improvement of the learners as well as increasing learners' motivations to learn due to the creative and fascinating learning atmosphere that Instagram provides (Zheng et al., 2018; Pujiati et al., 2019; Min and Hashim, 2022). For improving speaking skills, Instagram can offer short videos like tutorial videos or long videos like a live broadcasts and public speaking (Devana and Afifah, 2021). Considering writing skills, Instagram suggests communicative purposes and long-distance service (Soviyah and Etikaningsih, 2018). Learners can text messages privately or publicly as part of their designed class activity to improve their writing skills (Rasyiid et al., 2021). Furthermore, Instagram is a suitable source for practicing grammar and vocabulary due to its nature in providing materials with images and videos (Rasyiid et al., 2021).

Theoretical framework

Providing the psychological comfort of the learners is one of the major objectives of a successful education system. The engaging learning procedures and interactive tools in the educational process can stimulate learners to act effectively. To

capture the learning processes, Skehan (1998) proposed a model of learning called PPP (presentation, practice, and production) that attempts to introduce three steps of learning a language until reaching fluency. Criado (2013) referred to this model as the mainstream of English as a foreign language (EFL) style. Based on Anderson (2017), PPP model was introduced at the dawn of CLT. PPP model suggests that individual language items should be explicitly taught (P1), then practiced (P2) in isolated sentences through controlled activities, and at the final stage, learners produce (P3) these items in a freer manner (Harmer, 2007). Theoretically, PPP model is supported by skill acquisition theory (SAT) which emphasizes that learning triggers with explicit attention to a linguistic feature to establish declarative knowledge which is then proceduralized and automatized through practice (DeKeyser, 2007). Some previous studies witnessed the effectiveness of implementing PPP in explicit instruction (Norris and Ortega, 2000; Spada and Tomita, 2010; Anderson, 2017). Considering three steps of learning a language (PPP), the researchers of this study attempted to complete the first and second steps (i.e., presentation and practice) by using Instagram feed-based tasks instead of traditional drilling to inspect any possible changes in the production stage of the learners.

Furthermore, this study is fundamentally based on connectivism. This new learning theory (connectivism) argues that students should combine thoughts, theories, and general information in a useful manner. It accepts that technology is a major part of the learning process and that learners' constant connectedness provides opportunities to make choices about their learning. Connectivism originated from distributed learning (Siemens, 2004) and described the digital forms of communication within the course. In other words, the acquisition of skills through digital connections and social media are defined and supported by connectivism (Greenhow and Lewin, 2016). The concept of connectivism has implications in self-organization, which implicitly emphasizes the role of self-organization of the learners who create the larger self-organizing knowledge structures (Greenhow and Lewin, 2016).

Materials and methods

The current study is quantitative in nature and uses a pre-test-post-test quasi-experimental design. In the following, the undertaken steps are introduced in detail.

Participants

Among 125 freshmen EFL learners studying at the University of Gonabad, northeast of Iran, a sample of 84 participants (50 females, 34 males) was chosen based on the

results of the Oxford Quick Placement Test. The results of the Oxford Quick Placement Test indicated that the participants were at the intermediate level of English language proficiency. Also, during the research project, they did not attend extra English classes. Therefore, the level of English language proficiency of the participants was similar at the beginning of the study. They were from diverse socio-economic backgrounds, with the age range from 18 to 22. There were 43 students (28 female and 15 male) in the experimental group and 41 students (22 female and 19 male) in the control group. According to their syllabi, the students had to take an English grammar course in the first semester of the academic year (16 sessions). The students were fully aware of the voluntary nature of the study and gave informed consent to participate in this research project.

Instruments

The following instruments were utilized in this research:

Oxford quick placement test

To determine the Students' level of English language proficiency, the Oxford Quick Placement Test was administered. The score range in the Oxford Quick Placement Test is 0.1–0.9, and the scores between 0.4 and 0.6 are determined as an intermediate level of English language proficiency. The reliability of the Oxford Quick Placement Test in this study was 0.91.

English grammar pre-test and post-test

A researcher-made test was designed based on the topics of the suggested materials (Understanding and Using English Grammar, Azar and Hagen, 2009). This test contains 40 items in the form of multiple choice (15 items), fill in the blanks (15 items), and correct the errors (10 items). To inspect the face and content validity of the items, expert judgment was employed. In so doing, two psychometricians and six EFL professors were invited to evaluate the quality of the items. Based on their comments, some items were revised. Following this step, this test was used for a sample of 34 university students similar to the target population to check the test-retest reliability. To gauge the stability of the results over time, the same test was re-administered to the same participant after 2 months. Based on the results of the Pearson correlation coefficients, a high test-retest reliability of the test was confirmed ($r = 0.90$, $p < 0.05$).

Attitudes toward using social media for learning purposes

To investigate the learners' attitudes toward using social media for learning purposes, an instrument developed and validated by Shaheen et al. (2020) was utilized. This instrument involves 19 items with five sections as following: (a) demographic information, (b) the learners' experience with

social media platforms (one item), (c) social media usage (five items), (d) attitudes toward applying social media to enhance learning process (six items), and (e) the advantages of social media for learning (one item). This instrument is designed in multiple-choice items, five-point Likert scales, and free text. The reliability of this instrument estimated via Cronbach's alpha was acceptable (ranging from 0.759 to 0.878).

Procedure

In the first phase, the current study used a quasi-experimental design, and the participants were assigned to groups based on non-random criteria. In the beginning, the Oxford Quick Placement Test was used to determine the Students' level of English language proficiency. Based on the results of the Oxford Quick Placement Test (score range 0.1–0.9) and considering the cut score (0.4–0.6), 84 students were chosen for the present study. The students with the higher scores (between 0.7 and 0.9), showing high language proficiency were omitted, and the students with and intermediate level of English language proficiency were asked to participate in this study. Furthermore, the selected participants were asked not to attend any extra English classes during this research project. Prior to administering the treatment, a pre-test was carried out.

After the pre-test, the instruction was done by one of the researchers, who was the instructor of all of the courses in both the experimental and control groups. This study was carried out during one semester (16 sessions) in 2021. As part of their schedule, freshmen EFL learners were supposed to pass English grammar. To practice English grammar, Understanding and Using English Grammar (Azar and Hagen, 2009) was utilized for both groups. The students in the control group (41 students) received regular online instruction via webinar platforms (Adobe connect). In contrast, learners in the experimental group (43 students) practice English grammar via a social page of Instagram designed by the researchers. This page introduced various tasks intended to teach and practice English grammar based on the intended book (Understanding and Using English Grammar, Azar and Hagen, 2009) and the class syllabus. Each topic of this book was introduced with the help of interesting posts containing images, audio, and films. Both teachers and learners are capable of sending images, audios, and videos via Instagram. Moreover, the learners can ask and answer questions and receive feedback. To avoid any inconsistency during the treatment, the learners in the experimental group were asked not to share the information with their counterparts in the control group.

At the end of the semester (16 sessions), after the instruction was completed, a post-test was conducted to inspect the learners' achievements in both the control and experimental groups and investigate the effectiveness of the program. Both pre-test and post-test were scored by 3 EFL teachers to ensure the

reliability of the scores. The average score of pre- and post-test for each student was finally considered. Furthermore, to enrich the data, the learners in the experimental group were asked to complete the questionnaire of attitudes toward using social media (Shaheen et al., 2020). It was conducted via a web-based platform. The language of the questionnaire was English since all the participants were qualified to understand English. Conducting the electronic survey enables researchers to collect data from different regions.

Data analysis

To explore the efficiency of Instagram Feed-based Tasks on Learning Grammar among EFL Learners, one-way ANCOVA was run. In addition, a descriptive analysis of the questionnaire was employed to answer the second research question.

Results

Results for the first research question

To analyze the data in the first phase, the Statistical Package for Social Sciences (IBM SPSS, version 26) was used. The descriptive statistics for the pre-test and post-test of both the control and experimental groups are presented in Table 1.

The reported data in Table 1 indicates that the range of scores in pre and post-test grammar for the control group are as follows: 1.900–4.000 and 2.000–4.000, respectively. For the experimental group, the range of the scores in pre and post-test are as follows: 2.167–4.000 and 2.767–4.000, respectively. Thus, it can be inferred that applying a serious game for teaching grammar enhanced English grammar learning in the

TABLE 1 Descriptive statistics for pre-test and post-test of the control and experimental groups.

Groups		Pre-test grammar	Post-test grammar
Control	N	41	41
	Mean	2.835	2.882
	Std. Deviation	0.599	0.607
	Variance	0.359	0.368
	Minimum	1.900	2.000
	Maximum	4.000	4.000
Experimental	N	43	43
	Mean	2.955	3.509
	Std. Deviation	0.652	0.419
	Variance	0.425	0.176
	Minimum	2.167	2.767
	Maximum	4.000	4.000

experimental group. Following this step, the normality of the data was explored via the Kolmogorov-Smirnov test.

The results of the Kolmogorov-Smirnov test indicated that the distribution of scores was normal (Table 2). Thus, the parametric test of the independent samples t-test was utilized to inspect whether the differences between the two groups were statistically significant (Table 3).

Based on Table 3, the level of significance for the variance of the control and experimental groups in the pre-test of grammar was 0.661 ($p > 0.05$), therefore the variance of the two groups was equal. Regarding the means of the two groups in the pre-test of grammar, no significant difference between the control and experimental group was indicated. Considering the post-test of speaking, the level of significance for the variance of the two groups was (0.160, $p > 0.05$). Moreover, a significant difference between control and experimental groups was obtained in the post-test of grammar as the level of significance for the means of the two groups was statistically significant.

Results for the second research question

Students' demographic characteristics

On account of the design of the electronic survey (each part in the electronic survey form was designed to be necessarily linked), no data were missed. Their age range was from 18 to 21 years (22 female and 19 male). Based on their responses, all of them have smart devices, and 90.2% have computers at home.

Experience with social media platforms

About the experience with social media platforms, the answers were different. About 85.3% of the participants in the experimental group had the best experiences with Instagram. The other social media platforms were endorsed by students were as following: WhatsApp (77.9%), YouTube (59.6%), and Twitter (47.4%), respectively.

Uses of social media

As the data analysis revealed, 16 males and 20 females always use social media platforms. Among the social media platforms, Instagram was the most and Wikis the least preferred social media platform on a daily basis among the participants in the

TABLE 2 The Kolmogorov-Smirnov test for checking the normality of scores.

Groups		Grammar. pre	Grammar. post
Control	Kolmogorov-Smirnov Z	0.666	0.694
	Asymp. Sig. (2-tailed)	0.767	0.721
Experimental	Kolmogorov-Smirnov Z	0.806	0.826
	Asymp. Sig. (2-tailed)	0.534	0.502

experimental group. Moreover, the findings showed that males mostly preferred WhatsApp and females preferred Instagram. Nearly all the participants (36), 16 males (92.1%) and 20 females (95.3%), stated that they "always," "often," and "sometimes" employ social media for learning objectives. Based on the outcomes, almost all the participants spend 2–3 h in a typical day utilizing social media and social networks.

Attitudes toward using social media to support learning

As **Table 4** summarized, the overall attitudes of students toward applying social media for learning purposes were positive. Considering item number one, 88% of them strongly agreed that social media were important because they helped them with learning support. About 83.8% of the students, strongly agreed that it was a good idea to use social media to support learning. Regarding item number three, 85.8% of the students strongly agreed that learning online through using social media was fun. 83.7% found using social media for learning as a very desirable tool for learning. Moreover, 81.2% of the students reported that communicating with their classmates and instructor using social media provides them with good learning experiences. Considering item number five, 81.2% of the students preferred to join classmates in collaborative projects using social media. Among the students, 85.2% preferred to attend a class where the instructors applying social media in their teaching. Furthermore, the findings revealed that 39.1% of the students found it difficult to stop social media, when they started using it to support learning.

Benefits of social media for the learning process

Table 5 demonstrates the advantages of using social media for learning purposes from learners' perspectives. With regard to item number one, 85.2% of the students strongly agreed that they could find many educational resources, links, programs,

and topics of discussion when I used social media. Moreover, 80% of the learners strongly agreed that social media encouraged them to learn better than traditional teaching methods. About 82.3% of the students believed that their writing skills developed when they communicated with others through social media. As the data screening revealed, 92.6% of the students believed that watching videos through social media developed their grammar skills. Considering item number five, 91.4% of the learners strongly agreed that discussing and exchanging views with others using social media developed their critical thinking skills. Based on the results, 82.6% of the learners reported that communicating and interacting with their classmates and instructors through the social media helped them develop their social skills. About 82.6% of the learners strongly agreed that applications and programs provided by social media helped them to be more creative in their projects and assignments. Regarding item number eight, 81.3% of the learners strongly agreed that social media allowed them to learn collaboratively with others who have the same interests. About 82.4% of the learners, learning online through social media enhanced self-independent learning. 86.2% of the learners strongly agreed that they could learn anytime and anywhere using social media. Referring to the other contributions of social media, 90.7% of the learners believed that they could express their opinions and thoughts more freely through social media than in face-to-face discussions with their instructors and classmates in the classroom. In conclusion, 93.6% of the learners strongly agreed that the use of social media for the learning purposes develops their academic performance.

Discussion

In this section, the results of the study with regard to the prior theories and findings of the previous studies were discussed:

TABLE 3   *T*-test for the main four skills in pre- and post-test.

		Levene's test for equality of variances		*t*-test for equality of means				
		F	Sig.	T	df	Sig. (2-tailed)	95% Confidence interval of the difference	
							Lower	Upper
Grammar. pre	Equal variances assumed	0.196	0.661	−0.625	41	0.536	−0.508	0.268
	Equal variances not assumed			−0.628	40.863	0.533	−0.505	0.265
Grammar. post	Equal variances assumed	2.046	0.160	−3.985	41	0.0003	−0.945	−0.309
	Equal variances not assumed			−3.885	33.096	0.0005	−0.955	−0.299

TABLE 4 Students' attitude toward using social media to support learning.

			SD	D	N	A	SA
1	Social media are important because they help me with learning support.	Male	5.6	7.1	19.3	23.3	43.7
		Female	4.2	8.5	20.3	22.7	44.3
		Mean	4.9	7.8	19.8	23.0	44.0
2	In my opinion, using social media to support learning is a good idea.	Male	4.5	15.1	19.4	26.5	34.5
		Female	3.8	8.6	14.2	24.1	49.3
		Mean	4.1	11.8	16.8	25.3	41.9
3	I find learning online through using social media is fun.	Male	11.5	5.3	11.2	29.4	42.6
		Female	6.1	8.6	14.5	31.6	43.2
		Mean	8.8	7.1	12.85	30.5	42.9
4	I find using social media for learning is very desirable for me.	Male	4.1	10.7	17.2	24.6	43.4
		Female	9.4	8.4	20.6	21.3	40.3
		Mean	6.7	9.5	18.9	22.9	41.8
5	I prefer to join classmates in collaborative projects using social media.	Male	6.1	9.5	17.4	21.4	45.6
		Female	6.4	8.3	20.5	23.6	41.2
		Mean	6.2	8.9	18.9	22.5	39.9
6	Communicating with my classmates and instructors using social media provides me with good learning experiences.	Male	6.6	9.9	20.6	26.4	36.5
		Female	3.0	10.1	11.7	30.5	44.7
		Mean	4.8	10.0	16.1	28.4	40.6
7	I prefer to attend a class where the instructors using social media in his/her teaching.	Male	4.2	8.0	14.0	29.5	43.3
		Female	4.5	10.7	20.1	22.8	41.9
		Mean	4.35	9.35	18.4	26.15	40.6
8	When I started using social media to support learning, I found it difficult to stop it.	Male	11.4	7.6	25.4	35.4	20.2
		Female	6.7	19.1	41.1	14.2	18.9
		Mean	9.0	13.35	33.25	24.8	19.55

Discussing the first research question

This study was an attempt to depict the issue of MALL in learning English through SN tools, with the focus on English grammar learning via Instagram feed-based tasks. As the data show, Instagram feed-based tasks had a significant effect on the improvement of English learning grammar. That is, the students in the experimental group outperformed their peers in the control group. The results highlight a significant potentiality of MALL in learning English through SN tools (Instagram platform in this study), that is, teaching and learning indirectly with more enthusiasm. The outcomes of this study illuminated the contribution of Instagram feed-based tasks in enhancing the process of grammar learning.

It is worth highlighting that, Instagram feed-based tasks stimulate novelty, creativity, and engagement for the learners. More specifically, the tasks on this page were designed in a way that learners are supposed to follow all the posts step by step carefully, and all the facts and data were necessary for being clear about the next step. This opportunity may increase the possibility of long-term retention of grammatical structures and a satisfactory rehearsal of the rules. This finding

is confirmed by Naderi and Akrami (2018) found out that MALL improves learners' vocabulary retention. The results of Kurt and Bensen (2017) also supported the role of applying MALL in boosting long-term memory. Furthermore, Cheng and Chen (2022) asserted that MALL provide valuable contextualized language learning. In the same vein, Lei et al. (2022) noted that MALL guarantees learners' engagement, resulting in a more self-regulated, meaningful, and deeper learning. Similar to the present research's outcomes, Li and Hafner (2022) as well as Lin and Lin (2019) concluded that implementing MALL enhance vocabulary learning and increase learners' involvement. Mortazavi et al. (2021) also documented that MALL methods could improve both productive and receptive language skills.

The other possibility for improvement of the experimental group in comparison to the control group in this study lies in the fact that diversity and novelty in the types of proposed tasks on Instagram immerse students in the learning activities (presentation and practice stages). This implication was supported by previous studies, which confirmed the influential role of Instagram as a MALL tool in boosting learners' motivation, engagement, and attitudes toward learning

(Erarslan, 2019; Gonulal, 2019; Klimova and Polakova, 2020; Rasyiid et al., 2021; Guo, 2022). Taking a similar path, Chen Hsieh et al. (2017) provide evidence for the effectiveness of LINE in sustaining an engaging and encouraging language learning atmosphere. From the view point of teachers, Wardak (2021)

asserted that MALL facilitate vocabulary development and saving in-class time for other activities. Wrigglesworth (2019) also suggested the usage of smartphones to extend interaction beyond the EFL classroom. In the same vein, Wissam et al. (2020) highlighted the efficiency of social media in second

TABLE 5 Benefits of social media for learning process.

			SD	D	N	A	SA
1	I find many educational resources, links, programs, and topics of discussion when I use social media.	Male	8.6	11.0	20.1	21.0	39.3
		Female	3.8	7.3	19.5	23.6	45.9
		Mean	6.2	9.1	19.8	22.4	42.6
2	Social media encourage me to learn better than traditional teaching methods.	Male	8.9	13.9	12.3	25.3	39.6
		Female	6.2	10.2	11.5	31.7	40.4
		Mean	7.5	12.0	11.9	28.5	40.0
3	My writing skills develop when I communicate with others through social media.	Male	3.8	16.5	17.7	20.4	41.6
		Female	5.5	10.9	19.5	23.4	40.7
		Mean	4.65	13.7	18.6	21.9	41.1
4	Watching videos through social media develops my listening skills.	Male	5.1	11.4	15.2	25.3	43.0
		Female	2.0	10.5	14.5	23.4	49.6
		Mean	3.5	10.	14.8	24.3	39.3
5	Discussing and exchanging views with others using social media develops my critical thinking skills.	Male	3.4	10.3	15.0	28.4	42.9
		Female	3.3	6.9	17.5	23.8	48.5
		Mean	3.3	8.6	16.2	26.1	45.7
6	Communicating and interacting with my classmates and instructors through social media helps me develop my social skills.	Male	7.3	9.7	18.3	24.6	40.1
		Female	5.0	6.1	20.6	25.8	42.5
		Mean	6.15	7.9	19.45	23.0	41.3
7	Applications and programs provided by social media help me to be more creative in my projects and assignments.	Male	5.7	11.1	22.5	22.9	37.8
		Female	5.3	6.3	20.2	23.1	44.1
		Mean	5.5	8.7	21.35	25	39.45
8	Social media help me to learn collaboratively with others who have the same interests.	Male	5.0	9.4	22.6	24.3	38.7
		Female	3.2	10.8	20.1	23.3	42.6
		Mean	4.1	10.1	21.3	25.8	40.65
9	Learning online through social media enhances the self-independent learning I have.	Male	6.0	11.3	20.6	23.0	39.1
		Female	2.0	4.7	18.0	31.0	43.3
		Mean	4.0	8.0	19.3	27.0	41.2
10	I can learn anytime and anywhere using social media.	Male	6.4	10.2	15.0	27.4	41.0
		Female	3.1	5.8	14.1	31.9	45.2
		Mean	4.7	8.0	14.5	29.6	41.6
11	I express my opinions and thoughts more freely through social media than in face-to-face discussions with my instructors and classmates in the classroom.	Male	6.1	6.6	14.3	29.5	43.6
		Female	6.3	9.2	10.6	26.8	47.1
		Mean	6.2	7.9	12.45	28.15	45.35
12	In general, the use of social media for learning purposes develops my academic performance.	Male	3.8	8.9	12.8	24.4	50.2
		Female	6.8	10.3	14.3	25.1	43.4
		Mean	5.3	9.6	13.55	24.75	46.8

language acquisition and its significant role in developing self-awareness and self-evaluation among the learners.

The finding of this study is in accord with the previous studies, which have shown that applying MALL in learning English through SN tools affects different aspects of Students' language development positively. For instance, Ramalia (2021) found that Instagram could foster writing assignments. Similarly, Tarigan et al. (2021) confirmed the Instagram platform is an efficient choice for creative story telling among language learners. They also added that language learning via Instagram platform results in academic achievement satisfaction and cooperative learning. Kaviani et al. (2018) also demonstrated that Instagram a useful learning opportunity for language learning among EFL learners. Furthermore, Ngui et al. (2020) provided evidence for the contributions of MALL in autonomous learning. Taking a similar path, Kaviani (2022) used MALL as an instructional medium to teach speaking to EFL Taiwanese students. According to their findings, learners' immersion in learning activities through MALL could improve their speaking skills. The results of this research are also congruent with Zain et al. (2021) who provided evidence for fostering role of MALL-language learning at university.

As was mentioned before, the intended posts for teaching grammar tips on our Instagram page were designed in pictures, audio, as well as videos. The learners' positive feedback and immersion in learning activities could suggest that they were more encouraged to listen and watch the explanation of grammatical points through audios and videos. This rationale can be put forward that stimulating learners' visual-spatial and musical aptitudes promotes active learning. Similar to this research outcome, Alharbi (2019) addressed the issue of video-based grammar teaching and concluded this form of instruction immersed students in active learning. In the same vein, Reynolds and Taylor (2020) utilized the mobile application Kahoot! As an instructional medium to boost vocabulary learning. As they found out, utilizing videos and audio in teaching vocabulary triggers engaging learning.

Discussing the second research question

Concerning the second research question, the research outcomes suggest that learners' attitudes toward applying social media to support their learning process were significantly positive. This outcome can be justified due to various traits of social media. For example, one significant quality of Instagram is that it serves both the cognitive and affective needs of educators (Carpenter et al., 2020). Thus, it can be implied that via Instagram, learners are able to acquire knowledge and exchange emotional support. Another offering of social media in general and Instagram, in particular, is enhancing collaborative tasks in a distressful atmosphere. In other words, social media

play an essential role in authentic interaction among peers. In this regard, Albadry (2017) and Chang (2020) argued that interactions within social media platforms afford students a rich environment for mastery of language learning. In the same line of inquiry, Lailiyah and Setiyaningsih (2020) concluded that Instagram is the most popular social media. Their findings revealed that learners had positive attitudes toward Instagram provides a new way of learning language. Taking a similar path, Gonulal (2019) asserted that the use of Instagram in language learning encourage learners to be more active.

Furthermore, the efficiency of Instagram feed-based tasks can be attributed to its potential to activate learners' self-awareness, self-assessment, as well as autonomy. A reasonable explanation is that the implementation of Instagram feed-based tasks provides new dynamics to learners' self-government. Through Instagram feed-based tasks, learners are afforded to monitor their progress and assume responsibility for their own learning. They can also benefit from their peers' feedback aside from their self-formulated strategies that assist cooperative learning. This implication is supported by connectivism, which discusses the contributions of social media to self-organization of the learners. This implication is in accord with the findings of Sung et al. (2015) and Muftah (2022), confirming the effectiveness of MALL in improving learners' autonomy. The other essence of social media is fostering collaborative learning, which is one of the underlying foundations of social-constructivism.

Conclusion and implications

On the whole, this study was an attempt to contribute to the sparse knowledge on the effects of Instagram feed-based tasks in fostering grammar learning among EFL intermediate learners.

As the findings of the present study indicated, Instagram feed-based tasks are quite beneficial in grammar learning progress in the L2 contexts. Analysis of the result reflected that EFL university professors revealed positive attitudes toward the use of social media, especially Instagram for English grammar learning. They believed that learning through Instagram has the advantage of accelerating Grammar Enrichment Activities. This study opens a new window in teaching and learning grammar and calls for more attention to the role of Instagram feed-based tasks in the L2 learning process.

The findings of this study suggest some pedagogical implications for the learners, teachers, as well as educational system. It is important to note that incorporating MALL into curricula can increase learner access to course content much easily and provide opportunities for interaction with the course outside of the classroom. Moreover, it was approved that MALL is an affordance for learning and practicing grammar in that the learners are engaged to produce or consume content on a readily available device of their choice. One more point

which deserves special attention is the unique role of teachers in applying Instagram feed-based tasks in the L2 classrooms. While L2 digital literacy is necessary for practicing social media, it is suggested that L2 teachers should be equipped with knowledge about this influential factor in pre-and in-service teacher education programs. In other words, L2 teachers should be trained in such a way so that they will be able to use social media effectively. Therefore, policy makers, curriculum designers, and teacher educators are asked to consider such training programs for teachers and university professors. In this way, the learning environment will take advantage of more fruitful instruction.

Limitations and suggestions for future research

The findings of this study should be considered in light of some limitations: Firstly, the demographic information of the learners such as age, gender, and language level were not considered. Thus, it is recommended to consider these factors in similar research in future studies. Furthermore, the relationship between EFL learners' different socio-cultural backgrounds and Instagram feed-based tasks can be further explored in future studies. It is also suggested to undertake further research on the influence of Instagram feed-based tasks on other skills such as vocabulary expansion, listening, speaking, reading, pronunciation as well as writing. Another limitation of the present study could be attributed to its quasi-experimental design, which used intact groups a sampling procedure. Moreover, a rather small number of participants in both control and experimental groups makes the generalizability of the results limited. Future studies can conduct a similar study with more participants using experimental design. Further studies are required to employ other research approaches such as class observations, dairy, and focused group interviews to investigate the effects of Instagram feed-based tasks in more detail. Additionally, materials developers and curriculum designers are suggested to consider the contributions of MALL-based instruction in designing curriculum, instruction, and materials intended to facilitate language learning. Moreover, the same study is suggested to be conducted in other educational contexts such as schools and private language institutes. Last

but not least, exploring the possible similarities and differences between the effects of Instagram feed-based tasks and other social media is recommended for further future studies.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The effect of social media on the development of students' affective variables

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The use of social media is incomparably on the rise among students, influenced by the globalized forms of communication and the post-pandemic rush to use multiple social media platforms for education in different fields of study. Though social media has created tremendous chances for sharing ideas and emotions, the kind of social support it provides might fail to meet students' emotional needs, or the alleged positive effects might be short-lasting. In recent years, several studies have been conducted to explore the potential effects of social media on students' affective traits, such as stress, anxiety, depression, and so on. The present paper reviews the findings of the exemplary published works of research to shed light on the positive and negative potential effects of the massive use of social media on students' emotional well-being. This review can be insightful for teachers who tend to take the potential psychological effects of social media for granted. They may want to know more about the actual effects of the over-reliance on and the excessive (and actually obsessive) use of social media on students' developing certain images of self and certain emotions which are not necessarily positive. There will be implications for pre- and in-service teacher training and professional development programs and all those involved in student affairs.

KEYWORDS

affective variables, education, emotions, social media, post-pandemic, emotional needs

Introduction

Social media has turned into an essential element of individuals' lives including students in today's world of communication. Its use is growing significantly more than ever before especially in the post-pandemic era, marked by a great revolution happening to the educational systems. Recent investigations of using social media show that approximately 3 billion individuals worldwide are now communicating via social media (Iwamoto and Chun, 2020). This growing population of social media users is spending more and more time on social network groupings, as facts and figures show that individuals spend 2 h a day, on average, on a variety of social media

applications, exchanging pictures and messages, updating status, tweeting, favoring, and commenting on many updated socially shared information (Abbott, 2017).

Researchers have begun to investigate the psychological effects of using social media on students' lives. Chukwuere and Chukwuere (2017) maintained that social media platforms can be considered the most important source of changing individuals' mood, because when someone is passively using a social media platform seemingly with no special purpose, s/he can finally feel that his/her mood has changed as a function of the nature of content overviewed. Therefore, positive and negative moods can easily be transferred among the population using social media networks (Chukwuere and Chukwuere, 2017). This may become increasingly important as students are seen to be using social media platforms more than before and social networking is becoming an integral aspect of their lives. As described by Iwamoto and Chun (2020), when students are affected by social media posts, especially due to the increasing reliance on social media use in life, they may be encouraged to begin comparing themselves to others or develop great unrealistic expectations of themselves or others, which can have several affective consequences.

Considering the increasing influence of social media on education, the present paper aims to focus on the affective variables such as depression, stress, and anxiety, and how social media can possibly increase or decrease these emotions in student life. The exemplary works of research on this topic in recent years will be reviewed here, hoping to shed light on the positive and negative effects of these ever-growing influential platforms on the psychology of students.

Significance of the study

Though social media, as the name suggests, is expected to keep people connected, probably this social connection is only superficial, and not adequately deep and meaningful to help individuals feel emotionally attached to others. The psychological effects of social media on student life need to be studied in more depth to see whether social media really acts as a social support for students and whether students can use social media to cope with negative emotions and develop positive feelings or not. In other words, knowledge of the potential effects of the growing use of social media on students' emotional well-being can bridge the gap between the alleged promises of social media and what it actually has to offer to students in terms of self-concept, self-respect, social role, and coping strategies (for stress, anxiety, etc.).

Exemplary general literature on psychological effects of social media

Before getting down to the effects of social media on students' emotional well-being, some exemplary works of research in recent years on the topic among general populations are reviewed. For one, Aalbers et al. (2018) reported that individuals who spent more time passively working with social media suffered from more intense levels of hopelessness, loneliness, depression, and perceived inferiority. For another, Tang et al. (2013) observed that the procedures of sharing information, commenting, showing likes and dislikes, posting messages, and doing other common activities on social media are correlated with higher stress. Similarly, Ley et al. (2014) described that people who spend 2 h, on average, on social media applications will face many tragic news, posts, and stories which can raise the total intensity of their stress. This stress-provoking effect of social media has been also pinpointed by Weng and Menczer (2015), who contended that social media becomes a main source of stress because people often share all kinds of posts, comments, and stories ranging from politics and economics, to personal and social affairs. According to Iwamoto and Chun (2020), anxiety and depression are the negative emotions that an individual may develop when some source of stress is present. In other words, when social media sources become stress-inducing, there are high chances that anxiety and depression also develop.

Charoensukmongkol (2018) reckoned that the mental health and well-being of the global population can be at a great risk through the uncontrolled massive use of social media. These researchers also showed that social media sources can exert negative affective impacts on teenagers, as they can induce more envy and social comparison. According to Fleck and Johnson-Migalski (2015), though social media, at first, plays the role of a stress-coping strategy, when individuals continue to see stressful conditions (probably experienced and shared by others in media), they begin to develop stress through the passage of time. Chukwuere and Chukwuere (2017) maintained that social media platforms continue to be the major source of changing mood among general populations. For example, someone might be passively using a social media sphere, and s/he may finally find him/herself with a changed mood depending on the nature of the content faced. Then, this good or bad mood is easily shared with others in a flash through the social media. Finally, as Alahmar (2016) described, social media exposes people especially the young generation to new exciting activities and events that may attract them and keep them engaged in different media contexts for hours just passing their time. It usually leads to reduced productivity, reduced academic achievement, and addiction to constant media use (Alahmar, 2016).

The number of studies on the potential psychological effects of social media on people in general is higher than those

selectively addressed here. For further insights into this issue, some other suggested works of research include Chang (2012), Sriwilai and Charoensukmongkol (2016), and Zareen et al. (2016). Now, we move to the studies that more specifically explored the effects of social media on students' affective states.

Review of the affective influences of social media on students

Vygotsky's mediational theory (see Fernyhough, 2008) can be regarded as a main theoretical background for the support of social media on learners' affective states. Based on this theory, social media can play the role of a mediational means between learners and the real environment. Learners' understanding of this environment can be mediated by the image shaped via social media. This image can be either close to or different from the reality. In the case of the former, learners can develop their self-image and self-esteem. In the case of the latter, learners might develop unrealistic expectations of themselves by comparing themselves to others. As it will be reviewed below among the affective variables increased or decreased in students under the influence of the massive use of social media are anxiety, stress, depression, distress, rumination, and self-esteem. These effects have been explored more among school students in the age range of 13–18 than university students (above 18), but some studies were investigated among college students as well. Exemplary works of research on these affective variables are reviewed here.

In a cross-sectional study, O'Dea and Campbell (2011) explored the impact of online interactions of social networks on the psychological distress of adolescent students. These researchers found a negative correlation between the time spent on social networking and mental distress. Dumitrache et al. (2012) explored the relations between depression and the identity associated with the use of the popular social media, the Facebook. This study showed significant associations between depression and the number of identity-related information pieces shared on this social network. Neira and Barber (2014) explored the relationship between students' social media use and depressed mood at teenage. No significant correlation was found between these two variables. In the same year, Tsitsika et al. (2014) explored the associations between excessive use of social media and internalizing emotions. These researchers found a positive correlation between more than 2-h a day use of social media and anxiety and depression.

Hanprathet et al. (2015) reported a statistically significant positive correlation between addiction to Facebook and depression among about a thousand high school students in wealthy populations of Thailand and warned against this psychological threat. Sampasa-Kanyinga and Lewis (2015) examined the relationship between social media use and psychological distress. These researchers found that the use of social media for more than 2 h a day was correlated with a higher intensity of psychological distress. Banjanin et al. (2015) tested the relationship between too much use of social networking and depression, yet found no statistically significant correlation between these two variables. Frison and Eggermont (2016) examined the relationships between different forms of Facebook use, perceived social support of social media, and male and female students' depressed mood. These researchers found a positive association between the passive use of the Facebook and depression and also between the active use of the social media and depression. Furthermore, the perceived social support of the social media was found to mediate this association. Besides, gender was found as the other factor to mediate this relationship.

Vernon et al. (2017) explored change in negative investment in social networking in relation to change in depression and externalizing behavior. These researchers found that increased investment in social media predicted higher depression in adolescent students, which was a function of the effect of higher levels of disrupted sleep. Barry et al. (2017) explored the associations between the use of social media by adolescents and their psychosocial adjustment. Social media activity showed to be positively and moderately associated with depression and anxiety. Another investigation was focused on secondary school students in China conducted by Li et al. (2017). The findings showed a mediating role of insomnia on the significant correlation between depression and addiction to social media. In the same year, Yan et al. (2017) aimed to explore the time spent on social networks and its correlation with anxiety among middle school students. They found a significant positive correlation between more than 2-h use of social networks and the intensity of anxiety.

Also in China, Wang et al. (2018) showed that addiction to social networking sites was correlated positively with depression, and this correlation was mediated by rumination. These researchers also found that this mediating effect was moderated by self-esteem. It means that the effect of addiction on depression was compounded by low self-esteem through rumination. In another work of research, Drouin et al. (2018) showed that though social media is expected to act as a form of social support for the majority of university students, it can adversely affect students' mental well-being, especially for those who already have high levels of anxiety and depression. In their research, the social media resources were found to be stress-inducing for half of the participants, all university students. The higher education population was also studied by Iwamoto and Chun (2020). These researchers investigated the emotional effects of social media in higher education and found that the socially supportive role of social media was overshadowed in the long run in university students' lives and, instead, fed into their perceived depression, anxiety, and stress.

Keles et al. (2020) provided a systematic review of the effect of social media on young and teenage students' depression, psychological distress, and anxiety. They found that depression acted as the most frequent affective variable measured. The

most salient risk factors of psychological distress, anxiety, and depression based on the systematic review were activities such as repeated checking for messages, personal investment, the time spent on social media, and problematic or addictive use. Similarly, Mathewson (2020) investigated the effect of using social media on college students' mental health. The participants stated the experience of anxiety, depression, and suicidality (thoughts of suicide or attempts to suicide). The findings showed that the types and frequency of using social media and the students' perceived mental health were significantly correlated with each other.

Discussion

The body of research on the effect of social media on students' affective and emotional states has led to mixed results. The existing literature shows that there are some positive and some negative affective impacts. Yet, it seems that the latter is pre-dominant. Mathewson (2020) attributed these divergent positive and negative effects to the different theoretical frameworks adopted in different studies and also the different contexts (different countries with whole different educational systems). According to Fredrickson's broaden-and-build theory of positive emotions (Fredrickson, 2001), the mental repertoires of learners can be built and broadened by how they feel. For instance, some external stimuli might provoke negative emotions such as anxiety and depression in learners. Having experienced these negative emotions, students might repeatedly check their messages on social media or get addicted to them. As a result, their cognitive repertoire and mental capacity might become limited and they might lose their concentration during their learning process. On the other hand, it should be noted that by feeling positive, learners might take full advantage of the affordances of the social media and; thus, be able to follow their learning goals strategically. This point should be highlighted that the link between the use of social media and affective states is bi-directional. Therefore, strategic use of social media or its addictive use by students can direct them toward either positive experiences like enjoyment or negative ones such as anxiety and depression. Also, these mixed positive and negative effects are similar to the findings of several other relevant studies on general populations' psychological and emotional health. A number of studies (with general research populations not necessarily students) showed that social networks have facilitated the way of staying in touch with family and friends living far away as well as an increased social support (Zhang, 2017). Given the positive and negative emotional effects of social media, social media can either scaffold the emotional repertoire of students, which can develop positive emotions in learners, or induce negative provokers in them, based on which learners might feel negative emotions such as anxiety and depression. However, admittedly, social media has also generated a domain

that encourages the act of comparing lives, and striving for approval; therefore, it establishes and internalizes unrealistic perceptions (Virden et al., 2014; Radovic et al., 2017).

It should be mentioned that the susceptibility of affective variables to social media should be interpreted from a dynamic lens. This means that the ecology of the social media can make changes in the emotional experiences of learners. More specifically, students' affective variables might self-organize into different states under the influence of social media. As for the positive correlation found in many studies between the use of social media and such negative effects as anxiety, depression, and stress, it can be hypothesized that this correlation is induced by the continuous comparison the individual makes and the perception that others are doing better than him/her influenced by the posts that appear on social media. Using social media can play a major role in university students' psychological well-being than expected. Though most of these studies were correlational, and correlation is not the same as causation, as the studies show that the number of participants experiencing these negative emotions under the influence of social media is significantly high, more extensive research is highly suggested to explore causal effects (Mathewson, 2020).

As the review of exemplary studies showed, some believed that social media increased comparisons that students made between themselves and others. This finding ratifies the relevance of the Interpretation Comparison Model (Stapel and Koomen, 2000; Stapel, 2007) and Festinger's (1954) Social Comparison Theory. Concerning the negative effects of social media on students' psychology, it can be argued that individuals may fail to understand that the content presented in social media is usually changed to only represent the attractive aspects of people's lives, showing an unrealistic image of things. We can add that this argument also supports the relevance of the Social Comparison Theory and the Interpretation Comparison Model (Stapel and Koomen, 2000; Stapel, 2007), because social media sets standards that students think they should compare themselves with. A constant observation of how other students or peers are showing their instances of achievement leads to higher self-evaluation (Stapel and Koomen, 2000). It is conjectured that the ubiquitous role of social media in student life establishes unrealistic expectations and promotes continuous comparison as also pinpointed in the Interpretation Comparison Model (Stapel and Koomen, 2000; Stapel, 2007).

Implications of the study

The use of social media is ever increasing among students, both at school and university, which is partly because of the promises of technological advances in communication services and partly because of the increased use of social networks for educational purposes in recent years after the pandemic. This consistent use of social media is not expected to leave students'

psychological, affective and emotional states untouched. Thus, it is necessary to know how the growing usage of social networks is associated with students' affective health on different aspects. Therefore, we found it useful to summarize the research findings in recent years in this respect. If those somehow in charge of student affairs in educational settings are aware of the potential positive or negative effects of social media usage on students, they can better understand the complexities of students' needs and are better capable of meeting them.

Psychological counseling programs can be initiated at schools or universities to check upon the latest state of students' mental and emotional health influenced by the pervasive use of social media. The counselors can be made aware of the potential adverse effects of social networking and can adapt the content of their inquiries accordingly. Knowledge of the potential reasons for student anxiety, depression, and stress can help school or university counselors to find individualized coping strategies when they diagnose any symptom of distress in students influenced by an excessive use of social networking.

Admittedly, it is neither possible to discard the use of social media in today's academic life, nor to keep students' use of social networks fully controlled. Certainly, the educational space in today's world cannot do without the social media, which has turned into an integral part of everybody's life. Yet, probably students need to be instructed on how to take advantage of the media and to be the least affected negatively by its occasional superficial and unrepresentative content. Compensatory programs might be needed at schools or universities to encourage students to avoid making unrealistic and impartial comparisons of themselves and the flamboyant images of others displayed on social media. Students can be taught to develop self-appreciation and self-care while continuing to use the media to their benefit.

The teachers' role as well as the curriculum developers' role are becoming more important than ever, as they can significantly help to moderate the adverse effects of the pervasive social media use on students' mental and emotional health. The kind of groupings formed for instructional purposes, for example, in social media can be done with greater care by teachers to make sure that the members of the groups are homogeneous and the tasks and activities shared in the groups are quite relevant and realistic. The teachers cannot always be in a full control of students' use of social media, and the other fact is that students do not always and only use social media for educational purposes. They spend more time on social media for communicating with friends or strangers or possibly they just passively receive the content produced out of any educational scope just for entertainment. This uncontrolled and unrealistic content may give them a false image of life events and can threaten their mental and emotional health. Thus, teachers can try to make students aware of the potential hazards of investing too much of their time on following pages or people that publish false and misleading information about

their personal or social identities. As students, logically expected, spend more time with their teachers than counselors, they may be better and more receptive to the advice given by the former than the latter.

Teachers may not be in full control of their students' use of social media, but they have always played an active role in motivating or demotivating students to take particular measures in their academic lives. If teachers are informed of the recent research findings about the potential effects of massively using social media on students, they may find ways to reduce students' distraction or confusion in class due to the excessive or over-reliant use of these networks. Educators may more often be mesmerized by the promises of technology-, computer- and mobile-assisted learning. They may tend to encourage the use of social media hoping to benefit students' social and interpersonal skills, self-confidence, stress-managing and the like. Yet, they may be unaware of the potential adverse effects on students' emotional well-being and, thus, may find the review of the recent relevant research findings insightful. Also, teachers can mediate between learners and social media to manipulate the time learners spend on social media. Research has mainly indicated that students' emotional experiences are mainly dependent on teachers' pedagogical approach. They should refrain learners from excessive use of, or overreliance on, social media. Raising learners' awareness of this fact that individuals should develop their own path of development for learning, and not build their development based on unrealistic comparison of their competences with those of others, can help them consider positive values for their activities on social media and, thus, experience positive emotions.

At higher education, students' needs are more life-like. For example, their employment-seeking spirits might lead them to create accounts in many social networks, hoping for a better future. However, membership in many of these networks may end in the mere waste of the time that could otherwise be spent on actual on-campus cooperative projects. Universities can provide more on-campus resources both for research and work experience purposes from which the students can benefit more than the cyberspace that can be tricky on many occasions. Two main theories underlying some negative emotions like boredom and anxiety are over-stimulation and under-stimulation. Thus, what learners feel out of their involvement in social media might be directed toward negative emotions due to the stimulating environment of social media. This stimulating environment makes learners rely too much, and spend too much time, on social media or use them obsessively. As a result, they might feel anxious or depressed. Given the ubiquity of social media, these negative emotions can be replaced with positive emotions if learners become aware of the psychological effects of social media. Regarding the affordances of social media for learners, they can take advantage of the potential affordances of these

media such as improving their literacy, broadening their communication skills, or enhancing their distance learning opportunities.

Conclusion

A review of the research findings on the relationship between social media and students' affective traits revealed both positive and negative findings. Yet, the instances of the latter were more salient and the negative psychological symptoms such as depression, anxiety, and stress have been far from negligible. These findings were discussed in relation to some more relevant theories such as the social comparison theory, which predicted that most of the potential issues with the young generation's excessive use of social media were induced by the unfair comparisons they made between their own lives and the unrealistic portrayal of others' on social media. Teachers, education policymakers, curriculum developers, and all those in charge of the student affairs at schools and universities should be made aware of the psychological effects of the pervasive use of social media on students, and the potential threats.

It should be reminded that the alleged socially supportive and communicative promises of the prevalent use of social networking in student life might not be fully realized in practice. Students may lose self-appreciation and gratitude when they compare their current state of life with the snapshots of others' or peers'. A depressed or stressed-out mood can follow. Students at schools or universities need to learn self-worth to resist the adverse effects of the superficial support they receive from social media. Along this way, they should be assisted by the family and those in charge at schools or universities, most importantly the teachers. As already suggested, counseling programs might help with raising students' awareness of the potential psychological threats of social media to their health. Considering the ubiquity of social media in everybody' life including student life worldwide, it seems that more coping and compensatory strategies should be contrived to moderate the adverse psychological effects of the pervasive use of social media on students. Also, the affective influences of social media should not be generalized but they need to be interpreted from an ecological or contextual perspective. This means that learners might have different emotions at different times or different contexts while being involved in social media. More specifically, given the stative approach to learners' emotions, what learners emotionally experience in their application of social media can be bound to their intra-personal and interpersonal experiences. This means that the same learner at different time points might go through different emotions Also, learners' emotional states as a result of their engagement in social media cannot be necessarily generalized to all learners in a class.

As the majority of studies on the psychological effects of social media on student life have been conducted on school students than in higher education, it seems it is too soon to make any conclusive remark on this population exclusively. Probably, in future, further studies of the psychological complexities of students at higher education and a better knowledge of their needs can pave the way for making more insightful conclusions about the effects of social media on their affective states.

Suggestions for further research

The majority of studies on the potential effects of social media usage on students' psychological well-being are either quantitative or qualitative in type, each with many limitations. Presumably, mixed approaches in near future can better provide a comprehensive assessment of these potential associations. Moreover, most studies on this topic have been cross-sectional in type. There is a significant dearth of longitudinal investigation on the effect of social media on developing positive or negative emotions in students. This seems to be essential as different affective factors such as anxiety, stress, self-esteem, and the like have a developmental nature. Traditional research methods with single-shot designs for data collection fail to capture the nuances of changes in these affective variables. It can be expected that more longitudinal studies in future can show how the continuous use of social media can affect the fluctuations of any of these affective variables during the different academic courses students pass at school or university.

As already raised in some works of research reviewed, the different patterns of impacts of social media on student life depend largely on the educational context. Thus, the same research designs with the same academic grade students and even the same age groups can lead to different findings concerning the effects of social media on student psychology in different countries. In other words, the potential positive and negative effects of popular social media like Facebook, Snapchat, Twitter, etc., on students' affective conditions can differ across different educational settings in different host countries. Thus, significantly more research is needed in different contexts and cultures to compare the results.

There is also a need for further research on the higher education students and how their affective conditions are positively and negatively affected by the prevalent use of social media. University students' psychological needs might be different from other academic grades and, thus, the patterns of changes that the overall use of social networking can create in their emotions can be also different. Their main reasons for using social media might be different from school students as well, which need to be investigated more thoroughly. The sorts of interventions needed to moderate the potential negative

effects of social networking on them can be different too, all requiring a new line of research in education domain.

Finally, there are hopes that considering the ever-increasing popularity of social networking in education, the potential psychological effects of social media on teachers be explored as well. Though teacher psychology has only recently been considered for research, the literature has provided profound insights into teachers developing stress, motivation, self-esteem, and many other emotions. In today's world driven by global communications in the cyberspace, teachers like everyone else are affecting and being affected by social networking. The comparison theory can hold true for teachers too. Thus, similar threats (of social media) to self-esteem and self-worth can be there for teachers too besides students, which are worth investigating qualitatively and quantitatively.

Probably a new line of research can be initiated to explore the co-development of teacher and learner psychological traits under the influence of social media use in longitudinal studies. These will certainly entail sophisticated research methods to be capable of unraveling the nuances of variation in these traits and their mutual effects, for example, stress, motivation, and self-esteem. If these are incorporated within mixed-approach works of research, more comprehensive and better insightful findings can be expected to emerge. Correlational studies need to be followed by causal studies in educational settings. As many conditions of the educational settings do not allow for having control groups or randomization, probably, experimental studies do not help with this. Innovative research methods, case studies or else, can be used to further explore the causal relations among the different features of social media use and the development of different affective variables in teachers or learners. Examples of such innovative research methods can be process tracing, qualitative comparative analysis, and longitudinal latent factor modeling (for a more comprehensive view, see Hiver and Al-Hoorie, 2019).

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Author XX was employed by China Mobile Group Jiangsu Co., Ltd.

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Social media and academic success: Impacts of using telegram on foreign language motivation, foreign language anxiety, and attitude toward learning among EFL learners

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Concerning the ubiquity of social media, this research tried to examine the impacts of using Telegram on Iranian EFL learners' foreign language motivation, foreign language anxiety, and attitude toward learning. To achieve these purposes, 60 Iranian EFL learners at the intermediate level were selected and randomly divided into two groups: experimental and control. After that, both groups were pretested on motivation and anxiety variables. After pretesting, the participants in the experimental class received treatment *via* using the Telegram application, and the control students were trained traditionally without using any social media. After an 18-session instruction, a post-test of motivation and a post-test of anxiety were given to both groups, and also an attitude questionnaire was distributed among the experimental group to inspect their attitudes toward the Telegram application in language learning. The results of using two one-way ANCOVA tests showed significant differences between the post-tests of the control and experimental groups in favor of the experimental group. The findings demonstrated that using the Telegram application increased the motivation of the experimental group and decreased their level of foreign language anxiety. Also, the results of one sample t-test showed that the participants of the experimental group held positive attitudes toward using the Telegram application in English language learning. The implications of this research can encourage both teachers and learners to use social media-based instruments in English teaching and learning.

KEYWORDS

social media, Telegram application, foreign language anxiety, foreign language motivation, attitude

Introduction

The rapid changes in using technology and the frequent use of the Internet have affected the hierarchy of peoples' needs including instructional needs and communication needs (Trilling and Fadel, 2009; Diamandis and Kotler, 2012). Using technology in the educational system has significantly provided learners with several opportunities to act efficiently at this age (Suwastini et al., 2020; Puspitasari et al., 2021). The existence of technological tools such as online instruction helps the students learn more flexibly and understand that traditional classrooms are not the only place to learn and teach the English language (Dantes et al., 2019; Putra et al., 2020; Puspitasari et al., 2021; Utami et al., 2021).

One of the most common technology-based methods that has gotten too much popularity nowadays is social media. According to Kaplan and Haenlein (2010), social media refer to a group of Internet-based applications that are built on the technological and ideological basics of Web 2.0 and permit the exchange and creation of user-generated content. Social media allows users to make exclusively recognizable profiles animated by both user- and system-supplied information. Also, social media platforms help users to articulate connections that can be traversed and viewed by others. These connections are usually demonstrated in the forms of followers' lists, friends' lists, liked pages, group memberships, and so on (Ellison and Boyd, 2013). Zhang and Leung (2015) explained that the capacity to view and traverse other users' activities and connections is a distinctive characteristic of social media platforms that is almost unknown in the conventional forms of communication. Social media sites help users to use, generate, and interact with the streams of user-made content provided by their connections (Kane et al., 2014). Users make their content by mixing videos, animations, emoticons, images, text, and so on (Dumpit and Fernandez, 2017). As well as sharing their own content, consumers can use and interact with other users' content, by sharing, liking, and giving comments on them (Smith, 2017; Masrom et al., 2021).

One of the social media types is the Telegram application that offers several opportunities for online learning. Telegram has some great features including an integrated consumers' address book (Ghorbani and Ebadi, 2020), stickers for expressing conversations (Banafshi et al., 2020), and group channels for sharing information (Alizadeh, 2018). Recently, investigations have discovered that Telegram positively contributes to creating a stress-free and enjoyable learning setting for increasing learners' engagement, motivation, and curiosity, and decreasing their level of anxiety (Habibi, 2018; Banafshi et al., 2020; Rostami and Khodabandeh, 2020; Vahdat and Mazareian, 2020). In addition, the Telegram application offers interactive learning activities and extensive material presentations (Manik and Suwastini, 2020; Momami, 2020; Namaziandost et al., 2021).

The Telegram application transfers data and various means of social media to a Messenger network with more than 5,000 users. It manages all kinds of documents that can be accessed by smart mobiles and computers. Telegram, like a mobile phone, can write and read an email list (Ghobadi and Taki, 2018; Namaziandost and Çakmak, 2020), additionally, it can be downloaded freely by students to be implemented in learning and teaching. Based on Sarvari and Ezzati (2019), Telegram bridges the gaps between the students and the teachers when the students are absent from attending real classes. To check students' advancement, the instructors use the Telegram social media platform. This application makes language teaching and learning accessible to all and increases the motivation of the students to learn language virtually.

Motivation as a kind of motivational state has an influential role in English language learning. Motivation is generally viewed as a student's desire and inclination to be involved in or make efforts to perform some tasks (Zhou, 2012; Vadivel et al., 2021). Without having the desire to learn, learners are less likely to cooperate, take self-responsibility, or be completely involved in the process of language learning. Dörnyei (2001) states that motivation is considered a vital emotional state that influences second language learning achievements. In addition, Gredler et al. (2004) assert that motivation is the trait that pushes people to conduct some activities. Csizér and Dörnyei (2005) also state that motivation is a construct that describes why a human behaves as he/she does rather than how successful his/her behaviors will be. Dornyei and Ushioda (2011) view motivation as an element of enjoyment. Furthermore, they mention that motivation pushes people to decide, to involve in action, and to try and carry out the activities. A student is motivated when he/she tries to determinedly achieve goals and does her/his best to get them by applying strategies and approaches (Lovato, 2011; Boo et al., 2015; Liu et al., 2021). Several investigations confirmed the positive effects of having much motivation on developing the students' academic performances (e.g., Arabmofrad et al., 2019; Karabatak and Polat, 2020; Mammadov et al., 2021).

The other emotional state that can be influenced by social media is foreign language anxiety, which is defined as situation-specific, trait, and state (MacIntyre, 2007). Trait anxiety refers to people's predispositions to get anxious; state anxiety is ephemeral and relates to apprehensions that we experience at a specific moment, and situation-specific anxiety refers to experiencing anxiety in specific situations. Nevertheless, these three sorts of anxiety may not essentially be independent aspects, as revealed by recent studies that discovered that situation-specific and trait anxieties can be correlated to each other (Dewaele, 2013; Galante, 2018). Having anxiety causes EFL students who are not yet skillful to conduct poorly in learning the English language. Since anxiety is an affective factor that can be preventive for students in enhancing language learning

(Dornyei, 2005), examining EFL education that can reduce anxiety is paramount.

Using social media as an innovative teaching method can change the attitudes of EFL learners toward language learning. According to Richards and Schmidt (2002), attitude is the opinions and feelings that users of diverse languages or language varieties show toward each other's languages or their own language. Expressions of negative or positive feelings toward a language may mirror impressions of linguistic difficulties or simplicities, easiness or difficulties of learning, the extent of significance, elegance, social position, etc. Students' attitudes can be described as a collection of feelings concerning language use and its position in the community (Ahmed, 2015). Attitudes toward a language may also present what individuals feel about the users of that language. Learners' attitudes play a crucial role in maximizing teaching and learning outputs.

Based on the importance of the variables explained above, this research intended to investigate the effects of applying social media (Telegram application) as the independent variable on Iranian EFL learners' foreign language motivation, foreign language anxiety, and attitude toward learning dependent variables.

Review of the literature

The digital era and its modern technologies have substantially altered the ways of communication among people (Yadav et al., 2018). Today, technology, with its non-stop advances, has made some changes in learning and teaching (Hollands and Escueta, 2019). It has provided many opportunities for EFL students to connect with native speakers in an easy way (Reinders and Benson, 2017). The incorporation of technologies in the instructional contexts has brought auspicious chances for teachers and students to rise the effectiveness of the pedagogical processes (Yenkimaleki and van Heuven, 2019). In this respect, Spector and Yuen (2016) described instructional technologies as a theory and act of designing, making, utilizing, and assessing learning resources and processes.

Zengin and Aksu (2017) asserted that instruction has been influenced by technological improvements, including the internet, emails, computers, digital games, and mobile devices and programs. Boo et al. (2015) mentioned that applying technologies such as computers has a crucial role in the multisensory collection of texts, sounds, pictures, videos, animations, and hypermedia to supply meaningful situations to accelerate language learning. Therefore, it can be stated that it is commonly accepted that digital instruments are useful in learning attainment.

One of the most common technologies that are used frequently in learning and teaching is social media, which is applied by 49% of people across the globe (Tankovska,

2021). Social media exists in the form of blogging applications, micro-blogging applications, audio sharing applications, social networking sites, academic networking services, voice over the internet, and others (Chisenga et al., 2014). Regarding the positive effects of social media on learners' routine life, numerous specialists and researchers have discovered the positive uses of social media for learning and teaching, including language learning (Lau, 2018; Wu and Marek, 2018; Hamadeh et al., 2020) and English language learning (Ismail et al., 2019; Listiani et al., 2021). The majority of them verified that using social media appropriately can generate positive effects on both language learning and teaching.

The Telegram application is a type of social media that belongs to the Social Networking Service (Alizadeh, 2018). This application is a cloud-based social media application, implying that it can easily move conversations between smartphones, the web, and desktops. The Telegram application can share videos and pictures, transfer documents, and send current locations easily. Telegram has different features like those used as social media. The primary element of the Telegram application is almost the same as most other social media applications that can be utilized for conversation communication (chat), there is group chat, and sending files without size limitations. It is better than other social media as it does not have size restrictions for sending files (Aisyah et al., 2021).

Some theoretical perspectives support social medial in language teaching and learning. Two of them are the collaborative learning argument and sociocultural theory. The first perspective believes that social networking platforms can be used to make collaborative learning easier and inspire pupils to more beneficial learning engagements (Lampe et al., 2015; Eid and Al-Jabri, 2016; Raza et al., 2020; Hoi, 2021). Based on this perspective, the social and interactive characteristics of social networking platforms can be used to share information, conduct group work, receive feedback, and make interactions with teachers easier (Chawinga, 2017; Smith, 2017; Al-Rahmi et al., 2020; Ansari and Khan, 2020). Social networking platforms emphasize cooperation and group involvement as opposed to individual learning, thereby permitting learners to get active partners and socially involved in the process of sharing materials, discovering knowledge, and removing problems, which must develop their general learning and academic performances (Lampe et al., 2015; Sarwar et al., 2019; Astatke et al., 2021).

Based on the second perspective, knowledge is created cooperatively within social contexts. It views learning as a condition wherein learners generate their personal meanings from the materials and content delivered to them, rather than trying to memorize the information (Vygotsky, 1978). Additionally, the sociocultural theory is based on the notion that learning can be developed and constructed to be more useful within the orbits of social processes in cognition groups. Furthermore, knowledge is a constant process that

needs development with time, and learning occurs better when it follows social perspectives in constructive and effective processes (Brown et al., 1989). Based on Bhattacharjee (2015), the development of constructivism research in the recent age has developed the instruments and focus of media technologies for the quick transformation of knowledge and information to the next generations. Likewise, as offered by Stabile and Ershler (2015), learning is a procedure that leads to the transformation of culture, which may appeal to constructivists to re-examine the effects of social media on culture. The recent advent of social media has enormously influenced attitudes toward instruction by altering the landscape of information accessibility.

In sociocultural theory, learning and teaching need to concentrate on using content to improve tools of understanding, and these contents have got plentiful and simply accessible *via* social media. The impacts of social media, according to sociocultural theory, include important modifications to the ways learners usually communicate, and how they learn basic skills. Therefore, as social media allow the integration, distribution, and alteration of information, it has immense effects on the learning of the students. The benefits of social media platforms follow the rules backed by the constructivism theory (Kelm, 2011). For example, Churcher (2014) indicated that social media platforms result in online communications and sharing of information. Other research indicated that social media tools can facilitate social interactions, communication, participation, the use of current technologies, collaboration, the use of online programs, and the construction of personal meanings that satisfy the learning situation of constructivism (McLoughlin and Lee, 2010). Likewise, the sociocultural theory holds that information, personal activities, and social interactions can be collected by modern instruments of technology (Golub, 1988).

To check the effectiveness of using social media programs, several studies were examined. Chotipaktanasook (2016) examined the impacts of social media platforms on the willingness to communicate among EFL learners. The findings showed applying social media rose the willingness of the students to communicate more. Mompean and Fouz-González (2016) inspected the effectiveness of Twitter as a social media for developing pronunciation learning. Their objective was to find out if social media could boost online engagement and if it might assist learners to pronounce difficult words better. The results indicated that using Twitter as a kind of social media generated positive effects on pronunciation learning.

Zarei et al. (2017) aimed at examining the influences of Telegram on Iranian EFL students' vocabulary development and their attitudes toward vocabulary learning. To reach these goals, a panel of 100 Iranian EFL students with advanced levels took part in this research. They were chosen after they took the Oxford Quick Placement Test and they were assigned to control and experimental groups. The vocabulary instruction for each group lasted three weeks. The instruction was similar for the two groups except for exercises performed after the class. The experimental participants were required to fill out an attitude questionnaire after the instruction. Then, a vocabulary post-test was given to the subjects of the two groups. The outcomes of the study demonstrated that the experimental participants outdid the control participants on the post-test. The results of the attitude questionnaire revealed that the students presented positive attitudes toward applying the Telegram application.

Tabrizi and Onvani (2017) investigated the effects of Telegram as a kind of social site on vocabulary learning of Iranian EFL students. To attain this goal, 31 Iranian earners, aged 10–14, were chosen using the convenience sampling method. The researcher instructed the English vocabulary to students using two different methods: for one month by applying Telegram and for another month *via* the conventional face-to-face classroom instructions. The results of their study confirmed that using Telegram was more effective than using the conventional methods of vocabulary learning.

Shirinbakhsh and Saeidi (2018) investigated the effects of social media, more particularly Telegram, as an innovative method for training reading strategies in IELTS preparatory courses. The participants of the research were ILETS students studying IELTS preparatory courses in Isfahan, Iran. The participants were randomly divided into an experimental group and a control group, each including eight students. The control group was trained in the strategies by the conventional method, while the experimental group was taught the strategies by Telegram. The results of their investigation depicted that the experimental participants outflanked the control group in the post-test. The findings indicated that the majority of the students confirmed that they prefer to learn by Telegram.

Abu-Ayfah (2019) inspected the EFL College learners' perspectives on applying Telegram for English language learning. The respondents of the research were 300 EFL college learners, 200 female students, and 100 male students chosen at random from Tibah University in AL-Medina AL-Manwarah in Saudi Arabia. This research followed a quantitative method in which a survey questionnaire was applied as a tool for the collection of data. The findings showed that most EFL learners considered Telegram as a beneficial instrument for learning the English language, especially learning vocabulary.

Alodwan (2021) investigated the effects of employing the Telegram application on enhancing the writing skill of EFL learners. The subjects of the research were 75 who were a two-year Bachelor of English at The World Islamic Sciences and Education University in Jordan. The participants were assigned to two groups: control and experimental. The experimental group was trained by Telegram but the second group was trained traditionally. The results of the research indicated that there were noticeable differences between the means of the experimental participants and the control participants in the writing skill post-tests due to using the social networking Telegram in favor of the experimental participants.

Ammade and Khatimah (2021) examined the effects of the Telegram application on the English reading of the students. The data of this research were collected using a reading test to know the impacts of Telegram on students' reading ability, and A questionnaire was administered to get data on Telegram's efficacy on students' learning of English reading. The findings showed that the Telegram application could support the students' learning of English reading. The results of the questionnaire indicated that the students agreed that using the Telegram application was effective in English reading.

In another research, Mohd Dollah et al. (2021) examined the effectiveness of the Telegram application on developing ESL students' writing proficiency. A quasi-experimental design including pre-test and post-test was used in this research. The outcomes indicated that the utilization of the Telegram application improved ESL students' writing skills.

Meilia Rasiban (2021) investigated the effects of the Telegram application on Japanese language learning as a course for beginner Japanese students. The instruction concentrated on the Telegram application for primary Japanese language learners with various professional backgrounds. The findings indicated a remarkably significant relationship between rising motivation and interest in learning on learning outcomes and Japanese language abilities. The learners were more involved in Japanese language learning and more motivated to learn Japanese after the instruction. The researcher concluded that using the Telegram program was extremely effective in learning the Japanese language.

Having conducted a meticulous literature review, we found that social media has become widespread in all aspects of today's life, especially in our educational systems. The explanations and empirical studies show that using different social media platforms can generate positive and constructive effects on English language learning. Most conducted studies examined the effects of social media on language skills and language emotional states were ignored. Consequently, this research raised the following research questions to cover this gap.

> **Research Question 1.** Does the Telegram application as a sort of social media platform generate positive impacts on EFL learners' foreign language anxiety?

> **Research Question 2.** Does the Telegram application as a sort of social media platform generate positive impacts on EFL learners' foreign language motivation?

> **Research Question 3.** Does the Telegram application as a sort of social media platform help EFL learners to present positive attitudes toward English language learning?

Methodology

Participants

The participants of the present research were 60 Iranian EFL learners who were selected among 87 students. They have studied English as a foreign language for 5 years at one of the English institutions in Ahvaz, Iran. The participants' general English was considered intermediate on the basis of the findings of the Preliminary English Test (PET). The subjects of our study were chosen based on the convenience sampling method. Due to the gender separation in Iran, we could include only males in our research. The selected subjects were assigned to two groups of experimental and control at random.

Instruments

For homogenizing the general English proficiency of the respondents, a version of the PET test was given to them. Due to some restrictions, only the sections of reading, grammar, and vocabulary of the test were utilized in this investigation. We piloted the test on other similar participants and allocated 55 min for answering all its items. Its validity was acknowledged by three English specialists and its reliability was estimated at 0.89.

The other instrument was an attitude questionnaire created by the researchers themselves. Based on Dörnyei and Taguchi (2010), the questionnaire is one of the most common techniques for gathering research data. We employed a questionnaire to gather data on the participants' viewpoints regarding their attitudes toward using the Telegram application in learning the English language. There were 30 items in this questionnaire and each item had five options that the students were required to carefully tick off them. The Likert-type items were used in this instrument to show the extent of disagreement and agreement from 1 to 5, which were: completely disagree, disagree, no idea, agree, and completely agree. The questionnaire items were prepared with exact care to guarantee the quality, clarity, standard, appropriateness, reliability, and validity of the questionnaire. Three English professors with teaching experiences of more than 17 years verified the validity of the instrument. The reliability index of the questionnaire was estimated at 0.87 using Cronbach's alpha formula.

This research utilized a Persian version of the Foreign Language Classroom Anxiety Scale (FLCAS) created by the researchers themselves. All items of the FLCAS were translated into Persian to avoid any problems that Iranian EFL learners could face in answering the items. Then three English professors who had gotten their PhD in TEFL examined the wordings and content of the Persian version of this scale and verified its validity. After that, Cronbach's alpha formula was run to calculate the reliability of this tool and the results showed that

the reliability index was 0.81. Thirty-three items in the form of a five-point Likert scale were included in this questionnaire and they were used as the anxiety pre-test and post-test of this research.

The last research instrument was a questionnaire extracted from Gardner (2004) Attitude/Motivation Test Battery (AMTB). The original version of the questionnaire had 104 items but we selected those 74 items that measured the instrumental and integrative motivation, and attitude toward language learning. The items were in the form of a 5-point Likert-type from completely disagree to completely agree. All items were translated into Persian to help the participants understand them well. The validity of the AMTB was verified by those who examined the validity of the FLCAS. The reliability index of this scale was 0.84 based on the statistical findings of Cronbach's alpha. We used the AMTB questionnaire both as the motivation pre-test and post-test of the present research.

Procedures

To perform this study, first, 60 Iranian EFL students were chosen and divided into two groups: control and experimental. Next, both groups were pretested on motivation and anxiety. After that, the participants in the experimental group received treatment *via* the Telegram application, and the control students were trained traditionally without using any social media. Six lessons from the Top Notch 2 book were trained to the experimental group using Telegram. Each lesson was trained in two online sessions. The materials and content were sent to the experimental group at a certain time and the researcher explained them to the participants in the Telegram application. The participants were requested to practice and learn the materials cooperatively and asked the teacher only those hard parts that were incomprehensible to them. The teacher provided constructive feedback whenever the students asked for help. It should be noted that the conversation, vocabulary, and grammar of each lesson were instructed to the groups. The same materials were traditionally trained to the control group. The researcher personally attended the class and tough the control group in a face-to-face situation.

The instruction took 18 sessions, each took 55 min. The participants' homogeneity was guaranteed in the first session; they were pretested on motivation and anxiety in the second and third sessions; in the 12th session, the groups received the treatment. In the 16th and 17th sessions, the motivation and anxiety post-tests were administered, respectively. In the last session, the attitudinal questionnaire was distributed among the experimental participants to check their attitudes toward the use of the Telegram application in language learning.

Data analysis

Having gathered the data, we analyzed them based on the research questions. Therefore, we used one-way ANCOVA to see if the differences between the post-tests of the control and experimental groups were significant or not. Also, we used one sample t-test for analyzing the data of the attitudinal questionnaire to understand if they presented positive attitudes or not.

Results

To analyze the gathered data, we applied the SPSS software and reported the outcomes in Table 1.

As seen in Table 1, the control group's mean score is 60.10 and the experimental group's mean score is 104.36. It appears that the experimental participants got better scores than the control participants on the anxiety post-test. To find out the difference between the anxiety post-tests of both groups, a one-way ANCOVA test was used in Table 2.

According to the results indicated in Table 2, the variations between the anxiety post-tests of the experimental and control participants were statistically significant. Based on the significant values presented in Table 2, we can conclude that the experimental participants outdid the control participants on the anxiety post-tests. The treatment could help EFL learners reduce their anxiety levels during learning English.

In Table 3, the descriptive statistics of the two groups on the motivation post-tests are displayed. The experimental participants' mean score is 131.86 and the participants' mean

TABLE 1   Descriptive statistics of both groups on the anxiety post-tests.

Groups	Means	Std. deviations	N
Control	60.10	10.44	30
Experimental	104.36	19.88	30
Total	82.23	27.31	60

TABLE 2   Inferential statistics of both groups on the anxiety post-tests.

Source	Type III sum of squares	df	Mean squares	F	Sig.
Corrected Models	34663.47[a]	2	17331.73	105.46	0.00
Intercept	791.48	1	791.48	4.81	0.03
Pre	5270.41	1	5270.41	32.07	0.00
Group	28662.99	1	28662.99	174.41	0.00
Error	9367.25	57	164.33		
Total	449770.00	60			
Corrected Total	44030.73	59			

[a] $R^2 = 0.787$ (Adjusted $R^2 = 0.780$)

TABLE 3　Descriptive statistics of both groups on the motivation post-tests.

Groups	Means	Std. deviations	N
Control	119.86	20.95	30
Experimental	131.66	25.95	30
Total	125.76	24.12	60

TABLE 4　Inferential statistics of both groups on the motivation post-tests.

Source	Type III sum of squares	df	Mean squares	F	Sig.
Corrected Models	15682.51[a]	2	7841.25	23.93	0.00
Intercept	1390.74	1	1390.74	4.24	0.04
Pre	13593.91	1	13593.91	41.50	0.00
Group	1594.34	1	1594.34	4.86	0.03
Error	18670.21	57	327.54		
Total	983388.00	60			
Corrected Total	34352.73	59			

[a]$R^2 = 0.457$ (Adjusted $R^2 = 0.437$).

score is 119.66. According to the mean scores, we can say that the experimental students outdid the control students on the motivation post-tests. This claim can be rejected or accepted by conducting a one-way ANCOVA test, as shown in **Table 4**.

The results in **Table 4** show that the *Sig* value (0.00) is less than 0.05, this implies that there exists a meaningful difference between the motivation post-tests of both groups. Indeed, the experimental participants outflanked the control participants on the motivation post-tests. This betterment can be ascribed to social media (Telegram application). Using the Telegram application generated positive effects on students' language learning that resulted in increasing their learning motivation.

In the questionnaire shown in **Table 5**, all the mean scores of the questionnaire items were well above 3.00 (which is the average value of the choices where completely agree receives 5.00 and completely disagree receives 1.00). This implies that the experimental group of students agreed with all the questionnaire items, which were all positive comments about Telegram and applying it to learning English. The highest mean scores out there belonged to items # 6 and 30 (*M* = 4.73 and 4.80, respectively) through which the learners expressed that (a) learning through social media motivated them to succeed, and (b) using social media for learning purposes develops their academic performances. The overall mean score of the 30 items of the questionnaire equaled 4.34, as is also depicted in **Table 6**.

It is clearly observed in **Table 7** that the participants' attitude was significantly positive as the *p*-value was smaller than the significance level (*p* < 0.05). The participants of the

experimental group, thus, did welcome using Telegram for learning the English language in Iranian EFL contexts.

Discussion and conclusion

After gaining the results, it was shown that the experimental participants had better performances than the control participants both on the anxiety and motivation post-tests. It was discovered that using social media (Telegram application) reduced the participants' anxiety levels and increased their learning motivation. In addition, it was revealed that Iranian EFL students presented positive attitudes toward applying the Telegram application in learning English.

The outcomes of our research are in accordance with the previous research confirming the positive impacts of using social media on developing English language learning. For example, our research results are in agreement with Zarei et al. (2017), who investigated the impacts of Telegram on the developing vocabulary knowledge of Iranian EFL students. Their results demonstrated that using Telegram generated positive effects on the experimental group participants' vocabulary knowledge.

Besides, the findings of this research are in agreement with Tabrizi and Onvani (2017), who confirmed the effectiveness of using Telegram as a kind of social network for learning L2 vocabulary by Iranian EFL learners. The other study that confirms our results is the study that was conducted by Shirinbakhsh and Saeidi (2018), showing that applying Telegram was an effective tool for training reading strategies in IELTS preparatory courses.

Additionally, our outcomes are in accordance with Alodwan (2021), who checked the impacts of the Telegram application on developing writing skills and concluded that using Telegram as a kind of social networking developed the writing skill of the students in the experimental class. Furthermore, our findings are computable with Meilia Rasiban (2021), who inspected the effects of the Telegram application on Japanese language learning. His results depicted that using the Telegram application assisted the students to be more involved in Japanese language learning and become more motivated to learn Japanese after the instruction.

Moreover, the outcomes of this research are in line with Barton et al. (2018), who verified the positive impacts of using social media on students' motivation, attention, and academic performances. The findings of other studies carried out by Azabdaftari and Mozaheb (2012), Amemiya et al. (2007), Tozcu and Coady (2004) Chen et al. (2008), and Basoglu and Akdemir (2010) are similar to our findings.

Concerning the positive attitudes of Iranian EFL students toward using the Telegram application, our results are in line with Abu-Ayfah (2019), who surveyed the perceptions of EFL college students about the uses of Telegram in English language learning. His results revealed that the students presented a

TABLE 5 Participants' attitudes toward using social media.

	Completely disagree	Disagree	No idea	Agree	Completely agree	Mean
(1). Using Telegram gives me more room to express myself.	0	0	10	1	19	4.60
(2). I make my course assignments and projects applying social media applications	2	3	5	13	7	3.63
(3). Social media motivate students to learn more than the traditional methods.	0	1	3	16	10	4.16
(4). Using Telegram contributes to my personal development.	5	0	5	13	7	3.56
(5). Social media rises willingness to communicate among students.	0	0	3	17	10	4.23
(6). This Telegram motivates me to succeed.	0	0	0	8	22	4.73
(7). I would like to use Telegram when I become a teacher.	0	0	2	16	12	4.33
(8). I think Telegram makes learning easy.	0	0	5	11	14	4.30
(9). Using social media rises students' confidence toward EFL learning.	0	1	5	12	12	4.16
(10). I like to attend classes where the instructors use social media in their teaching.	0	0	1	12	17	4.53
(11). Communicating with my teachers and classmates utilizing social media provides me with a good learning experience.	3	0	2	10	15	4.13
(12). Social media inspire me to learn better than the conventional teaching approaches.	0	0	3	10	17	4.46
(13). Using social media for learning and teaching seems desirable.	0	0	1	10	19	4.60
(14). Social media positively affects my attention span	0	2	5	11	12	4.10
(15). I am pleased with applying social media for my learning.	0	0	1	11	18	4.56
(16). Using social media develops self-study.	1	3	5	7	14	4.00
(17). Telegram can be used at any time.	2	2	3	12	11	3.93
(18). Social media are useful for teaching all skills.	0	0	0	12	18	4.60
(19). Using social media is less boring than the traditional method.	0	0	0	10	20	4.66
(20). Using social media is good for shy students.	0	0	2	12	16	4.46
(21). Social media such as Telegram improves my communication with teachers and classmate.	0	1	2	17	10	4.20
(22). Social media such as Telegram helps me become an independent learner	0	0	0	19	11	4.36
(23). Social media such as Telegram reduces learners' anxiety toward EFL learning.	0	0	2	13	15	4.43
(24). Social media rises positive attitudes toward EFL learning	0	0	0	9	21	4.70
(25). Debating ideas and sharing opinions with others through social media develops my critical thinking abilities.	0	1	3	12	14	4.30
(26). Learning via social media develops self-independent learning for me.	0	2	2	14	12	4.20
(27). I express my ideas and thoughts more freely with social media than in face-to-face discussions with my teachers and friends in the classrooms.	0	0	0	10	20	4.66
(28). Interacting with the class group on social media aids me to develop my social capabilities.	0	0	0	13	17	4.56
(29). Social media assist me to learn cooperatively with those who have similar interests.	0	0	3	11	16	4.43
(30). Applying social media for learning purposes develops my academic performance.	0	0	0	6	24	4.80

positive attitude toward the Telegram application and most of them perceived Telegram as a useful device for English language learning. Also, our findings confirm those findings gained in the research done by Moulishree et al. (2020), which showed that the participants of their study held favorable opinions about using social media in language learning.

In addition, our outcomes are the same as Zarei et al. (2017), whose research participants presented a positive attitude toward applying the Telegram application in English language learning. Besides, the outcomes of our research are in line with Sharma (2019), who showed that Saudi EFL learners perceived social media as a beneficial strategy to develop English language learning. Additionally, this part of our outcome is in line with Shirinbakhsh and Saeidi (2018), who indicated that the participants in their study preferred using Telegram other than using traditional methods in learning reading skills.

Our results are supported by the collaborative learning theory, which states that utilizing social media can facilitate

TABLE 6 Descriptive statistics for experimental participants' attitudes scores.

	N	Means	Std. deviations	Std. error means
Attitude	30	4.34	0.30	0.05

The overall mean score of the questionnaire was well above 3.00, which showed that the participants had a positive attitude toward the instruction they had received *via* Telegram. To figure out if the positive attitudes reached statistical significance, a one-sample *t*-test was run.

collaborative learning and encourage learners to be more engaged in the learning process (Eid and Al-Jabri, 2016; Raza et al., 2020). Based on this theory, social networking sites increase the interactions between the students and teachers and help teachers to provide more feedback to the students. In addition, our findings are advocated by the sociocultural theory, which believes that knowledge is generated in a collaborative way within social contexts. Based on sociocultural theory, social media allow the integration, distribution, and alteration of information among students.

One reason behind our results can be the opportunity that the Telegram application provided for the students and teachers to create fun, private, simple, friendly, interesting, and comprehensive relationships both inside and outside of the class. The other reason can be ascribed to the nature of Telegram, which is interactive and provides discussions and constructive feedback for the learners to boost their English language learning optimally. Telegram as a useful platform has some effective properties including the ease of sharing personal opinions and peer inputs and inputs from the teachers to individual students. These features can assist EFL students to learn English more simply.

The other explanation for our results can be attributed to the ubiquity of Telegram, which contributes to exchanging personal ideas and peer feedback as well as the teachers' feedback to individual students. The other possible justification for our findings is that the participants of the experimental group did not attend the real class to face the teacher. Lack of facing with the teacher can reduce the anxiety of the students and also can increase the motivation of the shy and introverted students. One more justification for the obtained findings can be the fact that using Telegram permits the learners to learn and practice the English language at any time and any place they want. There is no time and place limitations while using social media for language learning; therefore, the learners can learn the materials at the place and time that they like the best.

Our findings can bring about constructive implications for EFL learners and teachers. The findings can encourage students to use different sorts of social media sites and instruments while trying to learn a new language. By using social media, the students can learn by themselves and develop their self-study and autonomy. In addition, EFL learners can utilize the Telegram application to enhance their English language outside the classroom. Using the Telegram application can stimulate self-study and change the role of the learners. By using social media, EFL learners can access the world's information easily and quickly. Therefore, they can understand that the world is in their hands and they can access a wealth of information that can rise their language learning motivation. In addition, using the Telegram application allows students to communicate *via* text and voice messages. Voice messaging is a relatively new feature that aids the students to develop their speaking and pronunciation skills by recording their answers in the chats. The Telegram application uses cloud storage so students can access teachers' conversations on different platforms, as mentioned earlier.

The results of this research can be beneficial for teachers. By using Telegram, the teachers can simply share the materials, and also, they discuss the materials with the learners freely. Besides, both instructors and students can experience a new teaching and learning process through Telegram. Our findings can persuade EFL teachers to utilize social media platforms in their classes to make lovely and lively contexts for learning. The social networks can assist EFL instructors to do their best to blend technologies and recognize barricades to technology incorporation. The spread of social media helps language teachers to develop social learning beyond the classrooms. Social media platforms have changed the conventional teacher-centered approaches and require instructors to be more innovative in adapting and customizing their own materials. In teacher-centered classes, students have passive roles in learning and they cannot take part in classroom activities. The results of this investigation can assist teachers to engage students in the learning process and abandon taking the full responsibility of teaching and bring up independent and autonomous language learners. Educators can also have more student-centered classes using the Telegram application in their teaching.

TABLE 7 One-Sample *t*-test results for the experimental participants' attitudes scores.

				Test value = 0		
	T	**df**	**Sig. (2-tailed)**	**Mean difference**	**95% Confidence interval of the difference**	
					Lower	**Upper**
Attitude	78.07	29	0.00	4.34	4.23	4.45

Shortly, the results of this research confirmed the positive impacts of applying social media (Telegram) on Iranian EFL learners' foreign language anxiety and foreign language motivation. Also, the findings indicated that EFL students held a positive attitude toward using the Telegram application in English language learning. Based on the findings, it is suggested that teachers use different kinds of social media platforms as complementary tools for face-to-face instruction. In fact, the Telegram application is presently one of the most innovative applications that can be employed in EFL classrooms. One effective way that teachers can aid language learners to learn a foreign language is by utilizing various technologies. One of the technologies that can be simply used to assist students is the Telegram application, which is dominating in most of the learners' life and is not only a communication application.

Incorporating Telegram channels into existing learning practices can supply informal learning situations and make new opportunities for English learning. Telegram as a social network instrument is getting one of the main devices for entertainment and education. The Telegram application is a social networking application that has numerous stickers with written English expressions and words. Students can even make communications without any texts and only *via* stickers and images; therefore, Telegram has an important effect on communication and learning the English language. Generally, it can be said that due to the efficiency of Telegram as a technological instrument that has already been verified to be welcomed by EFL students in Iran, learning English can also be further facilitated as students can simply associate the meanings of the vocabulary with the interesting stickers on their mobile devices.

We conclude that social media platforms have a vital role in foreign/second language learning. Therefore, it is highly important to encourage learners to utilize technology in their self-learning as well as language teaching because numerous students have much inclination to use technology only for entertainment.

Finally, the limitations of the study were mentioned, and accordingly, some suggestions were recommended. There were only 60 participants in this research; next researchers are required to perform other experimental studies with a large population to increase the generalizability of their outcomes. This research was conducted on males and the females were not included; next researchers are invited to work on the same topic on both genders. The results of this study were collected using quantitative instruments; next researchers are required to use qualitative instruments such as observations and interviews to gain more valid results. Additionally, the next studies are offered to investigate the impacts of different kinds of social media tools and platforms on different kinds of language skills and sub-skills. Next researchers are recommended to examine the attitudes of teachers toward the effectiveness of the Telegram application in their teaching. As this study was conducted on urban students; next studies can work on the same topic considering rural students.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The use of social media inside and outside the classroom to enhance students' engagement in EFL contexts

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It could be claimed that without any doubt the Internet has revolutionized the educational system to a great extent. Even though some are still interested in traditional ways of teaching and learning and also face-to-face classes, technological advances, in particular, social media have changed the English as a foreign language (EFL) contexts in a way that they will not be compatible with any other methods that have long been utilized before. Despite the fact that some studies have been conducted in different learning contexts, to the researcher's best knowledge, attention has not been focused on the importance of social media inside and outside the classroom on EFL students' indulgence. Therefore, the aim of this review is to synthesize the findings of the previous studies to highlight the role of social media in EFL students' engagement throughout class and outside the class in both face-to-face and online classes. To reach this goal, this review first discusses the impact of social media on engagement, and then engagement and its classifications are dealt with. Next, the relationship between using social media and students' engagement is discussed. And finally, some implications are proposed.

KEYWORDS

technological advances, social media, students' engagement, EFL contexts, language learning

Introduction

It is undeniable that the internet and technological advances have paved the way that one can learn and teach a new language. As technology has developed and social media has attracted attention, teachers have been given more opportunities to utilize technology to enhance teaching a foreign language. In recent years, there has been a general positive inclination toward technology-based education since it is time-saving and much more interactive. On the other hand, even though autonomy is the ultimate aim in the educational system and good teachers strive hard to make their students independent in the process of learning, some students have no tendency to use this kind of tool because they have always wanted to be supported by their teachers and cannot just use these tools as an alternative to the traditional way of teaching in which teachers are highlighted. Regarding social media

both inside and outside the class, it has been believed that both interaction and engagement can be enhanced through it (Al-Khalidi and Khouni, 2021). Moreover, students can create their own content at their preferable pace and it can be customized as well (Goel and Singh, 2016). In recent years, students' engagement is highly impacted by Social media. Engagement, on the other hand, is perceived as an important part of the process of learning. It is divided into various categories: Emotional engagement, for instance, when one is highly passionate about the activity and feels less anxious and tired. The second category of engagement is cognitive involvement in learning strategies and self-use restrictions. Agent participation as another category of engagement is a conscious effort for the learning experience to be enriched (Hiver et al., 2021). Even though the significance of social media in the EFL contexts has been discussed in some studies before, just a few studies have considered the impact of social media on students' engagement both inside and outside the class. To bridge the gap, this review study considers the impact of social media on engagement, then engagement and its categories are dealt with. Next, the relevance between utilizing social media and students' engagement is discussed. And finally, some implications are put forward.

Background

The impact of social media on education

Studies have indicated to what extent it is significant to consider the role of social media in EFL students' engagement. Researchers and educators have tried to find ways to cause EFL students to apply social media such as YouTube and Wikipedia in an interactive way. In an educational context, information technology has encouraged pedagogical practices through which practicable teaching and learning methods have been redefined. Social media platforms are a good example of these new technologies. They have been perceived by teachers as a force drive among teachers and learners. According to Kaplan and Haenlein (2010), social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web that allow the creation and exchange of user-generated content. It is a medium for social interaction as a super-set beyond social communication enabled by ubiquitously accessible and scalable communication techniques" (p. 63). The collaboration which is an important part of engagement is supported by social media, and important information sources are provided as a result of active involvement among learners by these platforms. As known, with the advent of social media, those EFL learners who received information passively have turned into those creating active content (Haque and Al Salem, 2019). Without any doubt, creativity is another paramount factor, considering engagement. The following terms, social networking and social media can be interchangeably utilized. However, social media is an umbrella term that helps convey messages. The first

study on the use of social media in education has been conducted by Baird and Fisher (2005). Moreover, the significant advantages of social media platforms for learners were identified by them. Students these days have been brought up in a world where the Internet and social media play a pivotal role. Hence, their expectations and learning styles have changed in comparison with the past generation. In the traditional way of learning, no emphasis was placed on making students independent and content creators; they were supposed to receive information; therefore, creativity played no pivotal role in their learning process. These days, students access electronic libraries, different types of information and social networking tools (Elsayed, 2011).

Nowadays, students can create their own content whose pace can be chosen by themselves and it also may be customized so that it can be perceived as engagement outside the class (Goel and Singh, 2016). It is not just students that have been affected by social media, but teachers are also impacted because they use social media that are supposed to support students and be active members of this collaborative learning community. According to Dabbagh and Kitsantas (2012), higher education institutions in some countries still trust traditional ways of learning and teaching, they are course-based, for example despite the fact that the spread of social media and its positive applications can make a difference in the way of learning and teaching. Another study carried out by Al-Sharqi et al. (2015) showed how students are influenced by social media, and the students claimed that social media helped them understand how people think and made them able to connect with various communities and learned to be more open-minded. It was also believed that social media reduced their boredom and alleviated their monotony which tremendously affect the way they are engaged in activities both inside and outside the class. On the other hand, those who were exposed to social media reported distraction and unproductivity as drawbacks which again have a negative impact on students' involvement. Group discussions, information access, resource sharing, and entertainment can be provided by social media and all of which are highly important for engaging the students. Furthermore, it was claimed that English proficiency could be enhanced by viewing and commenting on their friends' posts on Facebook which can be considered as advantageous, meaning that not only students can be involved in the activities in the class, but they can also practice after class (Shih, 2011).

Currently, it is claimed that not only is knowledge found in individuals but it can also be found when interacting with others. Therefore, active involvement is supported through such interactions which is really crucial in the learning process of students (Hrastinski, 2009). In other words, interaction is a crucial part of the engagement. Skills should be developed to transfer information and to acquire knowledge with others that are provided both in the contexts which are face-to-face and by means of social media which is a deviant of technology. Based on what has been claimed by Kabilan et al. (2010) learning communities can be built through collaborative work to boost the language. Moreover, social media is regarded as a tool through which the

enhancement of such communities can be facilitated by urging communication and collaboration. Additionally, they cause the accomplishment of favorable learning consequences to be easier according to Yu et al. (2010). Consequently, as shown by Shoshani and Rose Braun (2007) learning collaboratively and creatively can be strengthened through social media and as a result of which engagement increases either in class or outside. Collaborative learning is concerned with interactions among students. Moreover, an opportunity has been provided by social media to boost their learning environment because only a part of the learning process occurs during the class; therefore, students' involvement can be enhanced (Chen and Bryer, 2012; Friesen and Lowe, 2012; Wodzicki et al., 2012). It was further proposed by Fewkes and McCabe (2012) that educators' responsibility is to find ways to integrate social media into their classrooms. Students can be encouraged by educators to use social media to boost a sense of creativity by motivating them to probe the content material in a new way. It can be taken as an example, social media helps students to create real, creative materials, using tools including blogs, YouTube, and podcasts (Frye et al., 2010; Lamb and Johnson, 2010). And students are more likely to make a balance between their individualism and their need to communicate with others through a cooperative learning environment that encourages engagement (Shoshani and Rose Braun, 2007; Garrett, 2011).

Using technology independently does not necessarily result in learning. Aguilar-Roca et al. (2012) reported that taking notes by hand helps students accomplish better test scores compared with the ones who utilize laptops for taking notes. In addition, knowing something about computers has a good impact on students' learning when they use online ways of learning (Appel, 2012; Top, 2012). However, a rich environment can be provided by the Internet because students access different types of information for various levels, yet care should be taken in order not to feel baffled or distracted finding their own appropriate materials. Students who mainly take online courses allocate more time to utilizing tools and social media than students who mainly take face-to-face classes. Therefore, social media helps create an environment in which critical thinking, collaboration, and engagement can be enhanced by complementing student coursework with external sources (Carini et al., 2006; Mazman and Usluel, 2010).

The purpose of a study conducted by Rajendran and Yunus (2021) was to evaluate the international office services at the university level, considering the potential for improving English proficiency and integration into the American community for second/foreign language learners. These programs actively involve students in practicing English and consist of activities aiming at different aspects of life at an American university. The purpose was to find out how these activities have a positive impact on the students' language and social learning experience. The results provide a complete picture including language and cross-cultural opportunities in international office services related to the personal and social growth of international students. Mastering all four language skills is a top priority for

both ESL and EFL learners around the world. Apparently speaking skills remain the most challenging of all other skills many learners still struggle to speak well. The results of the review suggest that the application of *Mobile Assisted Language Learning*, MALL, extends the concept of constructivist theory, promotes a stress-free environment, supports situational learning, and provides ease of use which all facilitate the learning process and improve engagement. Further analysis shows that the common built-in features and mobile applications of mobile devices can be used as potential tools to help learners improve their speaking skills in the MALL environment.

According to another study conducted by Al-Khalidi and Khouni (2021), Social media technology has become an important part of all fields, especially in education and EFL/ESL education. It has had a profound impact on education and learning systems, leading to the emergence of learning communities supported by collective interaction and involvement. EFL students' attitudes toward the usage of social media platforms in the context of learning and teaching were scrutinized in this quantitative study. The findings showed that the majority of participants strongly believed in the benefits of social media platforms to support educational purposes and improve English skills. A study by Derakhshan et al. (2021) was carried out during the coronavirus pandemic to see what the reasons behind students' boredom are and some solutions were also put forward. It should be taken into account that boredom leads to less engagement and students do not feel energetic to be involved in the activities. It was reported that 10 types of activities caused boredom in students, among which two of them seem more significant, homework assignments that have a demanding nature and the ones that cannot actively engage the students such as passive listening and reading in class. Participants found it boring to hear the unattractive presentations of their classmates, in addition to the long and monotonous readings by teachers, such as previously prepared materials and PowerPoint slides. Teachers who were supposed to provide materials that were fun and engaging seemed to be just worried about providing access to content. In the mentioned study one of the solutions to remove boredom, which is one of the most important reasons behind not being engaged in the class, was that teachers can incorporate at least some principles of collaborative learning into their activities to lessen the effects of boredom and its devastating impacts. So social networks can act as a motivator to decrease boredom in classes. Encalada and Sarmiento (2019) indicated that students boosted their vocabulary, enhanced pronunciation accuracy and raised their confidence in their capability to speak English through self-recording videos which then could be shared through social media. According to Kirkgöz (2011), students' vocabulary was expanded and their oral skills were also enhanced after they were given a speaking task to record a video. It was reported that a sense of achievement could be developed in students through video or vlog projects and a sense of engagement could be also enhanced (Gromik, 2012, 2015; Aldukhayel, 2019). It was also shown that literacy proficiency could be improved through producing videos as speaking projects

(McKenney and Voogt, 2011; Yang and Wu, 2012), students' social skills while communicating with peers were also enhanced (Park, 2019), and active learning was promoted (Anas, 2019). It was revealed by Encalada and Sarmiento (2019) that students enhanced their vocabulary, pronunciation, and accuracy and built their confidence in their capability to speak English through self-recording videos as a speaking homework assignment which then could be shared through social media which is also another emblem of engaging students through the class and outside the class.

It is proven by the above studies that social media acts as a facilitator for students' engagement both inside and outside the class because it is accessible everywhere and students do not feel worried to learn something new even after their class time at home and whenever they feel like studying despite the fact that several years ago the only way to increase one's knowledge of English was joining a face-to-face class.

Students' engagement

Engagement is regarded as an integral part of the process of learning and is a multifaceted conception. It is divided into various categories: Emotional involvement, for example, when one is highly enthusiastic about the activity and feels less anxious and bored. The second category of engagement is cognitive involvement in learning strategies and self-use restrictions. Agent participation as another category of engagement is a conscious effort for the learning experience to be enriched (Veiga et al., 2014; Hiver et al., 2021). Within the above categories, participation in behavioral learning processes is particularly important as it relates to the authentic perception of individual learning capabilities (Dörnyei, 2019).

Engagement can also be seen from two different perspectives, inside and outside. The former means the amount of time and diligence that is allocated to the process of learning. The latter has a variety of learning options and potential consequences such as persistence and satisfaction (Harper and Quaye, 2009). Engagement is recognized as a behavioral tool to motivate students, and as a result, with care, development can occur throughout the learning process (Jang et al., 2010). Active participation in L2 instruction needs to be increased to prevent destructive behavior and reduce the value of negative emotions such as fear, frustration, and boredom. Another term, "dissatisfaction," can be considered important because it can be considered the opposite of engagement. Dissatisfaction is concerned with indifference, disgust, resignation, and reduced effort. Therefore, looking at boredom using the following factors can enhance the perception of boredom as a complex emotion and deal with it more systematically (Derakhshan et al., 2021). As mentioned earlier, students should have been taught to ask questions actively. This is a paramount part of thinking critically and is perceived as the core of student involvement. Students are highly likely to learn when they ask their questions. Some of the

students are habituated to not being faced with the consequences of their irrational decisions because they have always needed someone to support them or maybe take the responsibility for their own mistakes (Rezaei et al., 2011).

Adaptive e-learning is seen as a stimulus to support learning and improve student involvement. Therefore, designing a suitable adaptive e-learning environment contributes to the personalization of teaching to enhance learning outcomes. The results of a study conducted by El-Sabagh (2021) show the possibility of an adaptive e-learning environment that motivates students to learn. According to Qureshi et al. (2021), the development of classrooms for active learning will be part of a broader educational initiative for students to engage in learning. To this end, we investigated the impact of social factors on collaborative learning and involvement that affect student learning outcomes. It was proposed that social factors, such as interaction with peers and teachers, social presence, and the use of social media, have a positive effect on active co-learning and student participation and influence learning achievement. The results also showed that as online learning became more common in education, it was concluded that overall collaborative learning and inclusion of social factors improve student learning activities. Therefore, its use in education and learning in higher education institutions should be encouraged as it will affect the improvement of students' academic achievement.

Students' engagement and success are highly affected by the quality of the relationship between teachers and students (Zhang, 2020). As an example, people may suffer from financial poverty, leading to their unemployment. Likewise, lack of motivation may contribute to boredom or dropping out of university which means that regular interactions between teachers and students and also the learning atmosphere are the key factors for students' engagement (Derakhshan et al., 2021). Having a close student-teacher relationship may enhance socio-emotional improvement, contributing to being adapted and successful in EFL contexts (Pishghadam et al., 2019).

The advantages and disadvantages of utilizing social media and its impact on students' engagement, YouTube as an example

Social media can be used inside and outside the class and without a doubt, the number one reason it can be used is to boost EFL learners' engagement and communication. If it were not for social media, it would be difficult to keep in touch with students outside the class. In the new era of the educational system, students have been encouraged to feel autonomous and take responsibility for their own learning and social media has enabled them to reach this goal since they can interact with their peers and teachers even outside of the class. However, the question is how social media causes students' involvement. Content for example can be opted for and it can be discussed by students through social

media. They can also search for further information if needed and add their own part to the content so as to make it complete. In this way, they can boost their communication skills which are highly emphasized when learning a new language (even though accuracy and fluency are of paramount importance) and they can partake actively in these discussions. The second important point that can be taken into consideration is that students can learn more from their peers through social media and they can also be motivated by them; therefore, they are more inclined to engage in the activities. On the other hand, it might be claimed that interacting through social media would increase the risk of making mistakes and not being revised. It might be true but fear of making mistakes should not prevent a person from being actively engaged in the activities since it is a significant part of the learning process and how one's language skills could be enhanced if no mistakes would be made. In this respect, teachers should draw students' attention to the point that they are supposed to be more careful about what their peers send and write through social media. Students should also be urged to self-correct their own mistakes or their peers' mistakes if their knowledge of the language is good enough. Furthermore, teachers had better control the whole process to make it much more organized for the students. Students should not be left without any help even out of class because it may cause them to feel baffled or distracted. All this process should be regarded as a curriculum in order to be taken seriously by the students even though in many circumstances it has been considered an extracurricular activity because it is supposed to be done outside of class. Consequently, engagement is what should be urged among students and social media play a crucial role in it.

English learners in the context of EFL, where grammatical instruction is still prevalent, often lack the opportunity to use the target language both inside and outside the classroom. But when social media is considered, students are not limited to just learning through the class, but there is something beyond the class environment that allows learners to learn wherever and whenever they want. From another point of view, as a consequence of the COVID-19 pandemic, most learning around the world has been streamed online. Learners who were previously involved in traditional learning are now faced with the new challenge of a significant increase in e-learning. This dramatic change can affect their learning behavior and they do not resist the changes anymore. This can have a significant impact on their learning efforts. Before that, they have barely welcomed a change in the way they studied, but right after Covid 19 outbreak, they have been forced to use social media as a means of learning. Because through covid 19 pandemic everyone has lost his interest in learning a new language, social media could act as reinforcement so as to encourage students to be engaged in the learning process and enhance their knowledge of English even if there have been no face-to-face classes to join. The role of social media through the pandemic has been so tremendous that it cannot be denied throughout this period of time because students' inactive English skills could be activated by communicating with other English learners all over the world. From some students' point of view,

learning just happens when eye contact is made and physical interaction is used, but little by little they come to the recognition that it would not be difficult to communicate through social media for learning and being taught a foreign language.

Another point that can be stressed is that social media with all its great items has also brought its own negative effects. It causes the students to have a sedentary lifestyle in which physical activity plays no role despite the fact that in Total Physical Response, being physically active has had a significant impact on learning. But when using social media, one has to be bound to his seat in order to feel focused and do what he is supposed to do and that is the reason why they may get used to this destructive way of lifestyle and lose their interest in face-to-face communication through the class since they have spent most their time interacting with people through the virtual world. Another highlighted point is that some students have been given the ability to use the virtual word as a way of learning; however, some other students are not enthusiastic about learning through social media since they think their health might be at risk, for instance, their eyesight might be weakened, or they typing speed would not be as good as their handwriting. Hence, they are thought of as weak students in spite of the fact that they are not necessarily weak students in the real world. Just their preference goes to interacting with other students in real face-to-face learning contexts rather than reaching them through social media.

It was confirmed by several studies that YouTube is one of the useful language learning teaching tools because it has different types of learning videos and is classified as a rich source of teaching materials for young bilingual students (Moghavvemi et al., 2018; Sakkir et al., 2020; Wang and Chen, 2020). A similar study indicated the impact of utilizing YouTube as supplementary material for listening comprehension and scrutinized students' improvement after 5-week treatments conducted by Chien et al. (2020). It was claimed that YouTube was able to enhance the learning environment and build students' motivation to be engaged and to learn English, especially in improving students' listening comprehension. Chen and Chen (2021) also shared the same idea that YouTube videos could appeal to the students' full attention which is one of the most important factors which help them be actively engaged in the class and make students perform well. The most crucial point was teachers' need to keep an eye on choosing the right learning videos and control the proportion of the class activity to create good learning outcomes (Chien et al., 2020). Sari et al. (2020) explored the impact of YouTube videos on students' creativity during the lesson. The values of YouTube videos can improve students' creativity, interest, and motivation, and students were inspired to create new things, that is why they were more likely to be involved in the activity. Various educational videos, such as instructional videos, video tutorials, and animation videos, made students able to develop individual capabilities such as slime making, crafts, painting, and role-playing inspired by watching YouTube. Interactive activities helped students generate interesting ideas in the learning process. This was supported by the statement from Orús et al. (2016) that creativity is formed from new situations and

concerns that modify original ideas with something new and unique. Besides improving the students' vocabulary, listening skills, and creativity, the use of YouTube videos has also been observed in terms of the effects on students' learning outcomes, satisfaction, and self-improvement. Students took part in the video project creation using YouTube. Students who were active in creating videos on YouTube were proven to affect their competence and build a good academic performance. Azer et al. (2018) stated that YouTube had positive contributions, especially in subjects they did not understand and students watched videos from YouTube as a substitute for textbooks. For example, instead of being taught some materials through the class, students can watch the lessons on YouTube and improve their English. It is where students' engagement out of class can come to meaning.

Recommendations for future research

Three groups can be benefited from this study. First teacher educators have the responsibility of training teachers. Teachers should be taught how to use social media to stretch students' imaginations and boost their creativity. Without a doubt, there is a difference between students who have been actively engaged in social media to boost their knowledge of the language and a student never being given the opportunity to use social media as means of learning. The former group has been given the opportunity to share its content through the platforms through which many learners can learn a foreign/s language.

Another point that could be taken into account is that social media provides teacher educators and teachers themselves with customized ways of teaching. In this respect, students are highly likely to be engaged in the activities since the emphasis was put on individual differences and everyone can be given precise attention to use and sometimes produce his own content. While in the traditional way of teaching, students were provided with a specific type of task as their homework assignments and they were supposed to do it on their own. Instead with the help of social media, even if students are given the same task, they are expected to work on it in peer groups and in this way collaborative work is

enhanced among students, and as a result of which their motivation for learning can be boosted and they can learn from their own mistakes without being directly reprimanded by their teachers.

On the other hand, students can be benefited from this way of learning and teaching since they can learn through group work and both inside and outside the class. In flipped learning, the attention was focused on learning not only in the classroom but also when students are out of the class. Because in the modern way of learning, the effort is made to make students feel autonomous and teach them how to learn, considering that social media can play a crucial role in it. Hence, more studies need to be conducted to go through the details of what can be done in social media outside the class so as to cause students to be more engaged and inspired to learn more and more and enjoy the learning process.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Flipped classroom: Challenges and benefits of using social media in English language teaching and learning

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Due to the emergence of new technologies, reforms in higher education require changes in traditional education. The flipped classroom approach can be a solution to such educational changes to create a student-centered individual learning environment. This approach, which is a type of blended learning, has effectively integrated traditional education and social networks using both environments inside and outside the classroom. The current review is to provide an overview of flipped classroom studies in language teaching contexts. Particularly, the study put emphasis on revealing and addressing the potential benefits and challenges of flipped classroom approach for teaching using social media. It focused on learning environments that students were exposed to the lecture content before the class in a collaborative and interactive learning environment using well-known social media applications. Twenty-five journal publications of flipped classrooms were analyzed in terms of their flipped learning activities, learner achievement, learner attitude, and challenges encountered. The analysis of the selected studies showed that the flipped classroom approach has a positive effect on learning, reducing cognitive load, involvement, accuracy, motivation, attitude, and satisfaction with the course and self-efficacy in higher education, and one of the most important challenges of the flipped classroom is the lack of familiarity and appropriate adaptation of students. With the inversion method, there was an increase in teachers' workload. According to the analysis of the selected research findings, it is concluded that higher education can effectively use this method.

KEYWORDS

flipped classroom, social networks, blended learning, online education, higher education

Introduction

Today's students are the citizens, workers, parents, employees, teachers, and leaders of the future (Akçayır and Akçayır, 2018). Student dropout rates show that our education system and the ways in which we prepare students for adulthood need to be reformed (Bergmann and Sams, 2012). Multiple-choice exams continue to assess the knowledge that

can be achieved through the lowest levels of learning. Today, traditional lectures in classrooms do not have the necessary effectiveness, because this method causes superficial information to be received that will be forgotten with the passage of time (Hung, 2015; Rajabi, 2015; Mehring, 2016; Webb and Doman, 2019).

According to Mehring (2016), the most pointless thing for students to do is to give long lectures in the classroom and then send them home to do real homework without support. During the last few years, the needs, goals, and performance of learners have changed; they often have easy and quick access to information and prefer to be present in collaborative learning environments with learner-oriented activities (Munir et al., 2018; Mellati et al., 2022). Now the internet and mobile computers are widespread and access to information is easy. It is no longer necessary to keep their information in hand. The world outside of school has changed, while the traditional classroom still stands (Mellati et al., 2013; Aghaei, 2016; Sojayapan and Khlaisang, 2020; Strelan et al., 2020). As Milman (2012) has shown in his research, advanced technologies, the growth of online and available content, and the growth of cognitive science have challenged traditional teaching and learning thinking.

In these situations, one of the methods that can be used to reconstruct the way of teaching and get help from online resources and Internet technology is called flipped classrooms. However, it is necessary to make a fundamental change in the teaching method (Mellati and Khademi, 2014; Aliyyah et al., 2020). In the classroom, in the traditional way, the teacher presents the lesson and moves the class process forward, but in the reverse teaching method, it is up to the students to move the class process forward. Educational technology and activity-based learning are two main elements in the flipped learning model. Both of the above elements affect students' learning environment in a fundamental way (Bishop and Verleger, 2013).

The reverse learning strategy is one of the learning-teaching strategies that has attracted the attention of international experts in the field of education and upbringing in recent years and can be proposed as a solution to the mentioned problem, during which the usual and current processes of the classroom, especially the lesson delivery section, are shown in the form of an educational film (Mellati and Khademi, 2015; Chen et al., 2018). The recording is given to the students and after watching it and solving the worksheets and exercises, the students come to the classroom with relative preparation (O'Flaherty and Phillips, 2015). In this way, the considerable time that should be allocated for the teaching part is available to the teacher to deal with interactive activities, solving students' learning difficulties, and generally activities at the higher level of the learning pyramid, which is based on creation, evaluation, and analysis (Mellati and Khademi, 2018; Derakhshan et al., 2020; Lee, 2020). In fact, in this educational strategy, the role of the teacher, student, and educational content is relative to the teaching model. The ritual is reversed and the class time is dedicated to group activities and interpersonal interaction instead of being limited to presenting content

(Latorre-Cosculluela et al., 2021). The networks were able to gain a lot of popularity in recent years and this popularity is still increasing, so that they have more than hundreds of millions of users worldwide. These networks have an essential function in various streaming activities with free subscriptions from users. Social networks have been welcomed due to their diverse functions to promote the Internet-based lifestyle (Aguilera-Ruiz et al., 2017; DeLozier and Rhodes, 2017; Lee, 2020). Meanwhile, students and academics are among the main users of educational technologies, including the Internet and social networks (Aliyyah et al., 2020; Collado-Valero et al., 2021). In addition to personal applications, this tool has many uses in education and research, and it can enlarge the level of knowledge and ability of the learners and academics through quick and cheap access to information and scientific resources. The modern intelligent information environment is the result of the emergence and gradual institutionalization of web-based virtual social networks in all human activities of the new century.

While the previous reviews have provided some useful overview over the flipped classroom research, these reviews appear to be inadequate to inform us about the practice of flipped classroom approach in language contexts. Some review studies limited their search only to the higher education context (Almaiah et al., 2020; Wen and Piao, 2020). Some other reviews examined subject disciplines that are usually offered in post-secondary education such as nursing (Mangaroska and Giannakos, 2019; Shi et al., 2020). There are also controversial issue regarding the use of flipped classrooms in the teaching instructions. To the knowledge of the researchers, few literature review study has been done that focuses specifically on the flipped classrooms in language teaching using social media. A systematic review is thus necessary to investigate the implementation of flipped classrooms language teaching field of study. Therefore, the purpose of the current review is to provide an overview of flipped classroom studies in language teaching contexts. Particularly, the study put emphasis on revealing and addressing the potential benefits and challenges of flipped classroom approach for teaching using social media. It focused on learning environments that students were exposed to the lecture content before the class in a collaborative and interactive learning environment using well-known social media applications.

An overview of flipped classroom studies

Several years ago, two science teachers at Woodland Park High School in Colorado implemented the concept of flipped learning in the classroom. Jonathan Bergman and Aaron Sams decided to use lecture recording software to record introductory science courses and give students the opportunity to watch the lectures as homework (Bergmann and Sams, 2014). Therefore, students had more opportunities to do constructive activities in the classroom. Although the use of the concept of reverse learning in education dates back to 2007, in the early stages of this method,

it was limited to teaching online courses through the Internet. In their book Flip Your Classroom, Bergman and Sams describe how they began making videos of their teaching to increase the human, face-to-face interaction students have with each other in the classroom (Bergmann and Sams, 2014; Mellati and Khademi, 2020). Salman Khan officially launched his Khan Academy in 2008, offering step-by-step videos teaching math and science concepts. The idea of using these videos originated from some of his online tutoring sessions with his nieces. He soon realized that by recording these videos, his nieces were able to keep the videos, rewind them, or watch them as many times as needed. Salman Khan began to revise the traditional teaching method to adapt to the 21st century. With the financial support of several philanthropists including Bill Gates, Salman Khan began to build and provide more lessons for a larger class than he had before (Mellati et al., 2018; Andujar and Salaberri-Ramiro, 2021). The flipped class, which is also called by other titles such as flipped class, flipped learning, or reversed classroom, is an educational model in which the traditional way of lecturing and the way students do homework are changed (Almaiah et al., 2020).

Definition of flipped classroom approach

In the traditional classroom, teachers can only cover cognitive skills up to the level of memorization and understanding with the lecture method. They then send the students home with homework, leaving the core levels of cognitive skills (applying, analyzing, evaluating, and synthesizing) to the student (Wallace, 2014). This is while deep learning involves reaching the same four high levels of knowledge. The student does the assignments alone and maybe with the help of guidebooks and exercise solutions, without analyzing and evaluating, or having an environment to apply and be creative and combine, and a week later to present to the teacher in the classroom (Alavi et al., 2021; Teo et al., 2022).

In the reverse teaching method, however, the teacher's teaching flow is reversed. First, the teacher prepares the material to be presented in the form of a lecture in the class using educational content production and recording software or from the Internet and provides it to the students (Aguilera-Ruiz et al., 2017). Students see, listen to, and take notes at their own pace. In fact, they acquire the levels of knowledge and understanding in this way and they enter the classroom with the help and guidance of the teacher, interact and discuss in groups with their classmates and face challenging assignments to reach higher levels of cognitive field (Bralić and Divjak, 2018). In other words, the teaching-learning method can be classified into two passive and active forms. In fact, passive learning is done outside the classroom and at home to reach basic levels of cognition, and in the classroom through active learning methods, students acquire high levels of cognitive skills (Cheng et al., 2019; Derakhshan et al., 2021).

The flipped classroom approach is defined as 'everything that was traditionally done in the classroom is now done outside the classroom and vice versa' (Asiksoy and Özdamli, 2016). However, simply changing the order of teaching and learning activities is not enough to describe this educational approach. Therefore, Bergman and Sams tried to define the flipped classroom approach systematically (O'Flaherty et al., 2015). As they defined, the flipped classroom approach is a technology-supported educational approach that consists of two components: (1) Individual and direct computer-centered education outside the classroom through video lectures and (2) Group interactive activities inside the classroom (Mellati et al., 2015a; Mangaroska and Giannakos, 2019). Specifically, this definition emphasizes the need to use educational video in learning outside the classroom. However, there are reports of the use of media other than video in the flipped classroom approach, such as the use of presentation files, electronic books, social media, and even paper books (Aydin, 2014).

Social media in a flipped classroom

One of the most widely used technologies that have been mixed with the lives of many people in the world is the new communication technologies through the Internet. The Internet has been able to play an effective role in various subjects, one of the most prominent of which is the educational aspect (Bakker and Bal, 2010). The Internet has given the teacher many capabilities to create new learning environments, which has brought many advantages. There are two major educational models for using the Internet and the Web teaching network for global learning: Web-based education and Web-based enriched learning. The main distinction between the two models is that Web-based learning uses the Web and Internet technologies as the primary medium for delivery, while Web-based enriched learning uses Internet technologies and resources in the classroom to support Learning and teaching uses (Kim et al., 2014). Web-based training is also called web-based training, web-based learning, or simply e-learning. Web-based education is a form of distance learning that provides education through computers, standard Internet technologies, especially the World Wide Web. Web-based enrichment learning is a classroom-based educational approach that allows learners to use Internet technologies, especially the Web, to access targeted and specific information and human resources in ways that lead to learning (Lindeiner-Stráský et al., 2020). Web-based enriched learning can expand teaching and learning beyond information retrieval to solve problems and lead to knowledge creation. Web-based enriched learning can provide multiple learning contexts for learners and teachers, develop independent learning, and facilitate collaborative communities of learners and teachers (Seaman and Tinti-Kane, 2013; Xie and Derakhshan, 2021). Today, what has caused worldwide attention to education through computers are actually the expansion of the global Internet network and the ease of access to it. It is important to remember that the Internet is a network of networks and

connects computer networks around the world to a vast network (Basal, 2015).

Therefore, social networking websites have quickly developed and become well-known in the last 10 years. The extensive use of social networking websites can become optimal as the novel education media to engage learners in social communication (Betihavas et al., 2016). It can be used both for individual contact as well as for teaching goals. Literature shows that the application of social networking platforms has been commonly used in classes, aimed at achieving various learning purposes. Some studies have sought to shed light on the impact of various technologies on the facilitation of language learning. Social networks are sites that allow people to express their beliefs and interact socially with others. Self-expression and social interaction are important contexts for language use (Shtaleva et al., 2021). In the field of education, the positive aspects of social networking sites and their use are being revealed. One of the most important uses of social networks in education is their use in flipped classrooms. Flipped learning can transform traditional teaching methods (Veldthuis et al., 2020). The way of working is that the tests are given to the students online outside the classroom and the assignments that were done at home before are done in the classroom. Flipped learning, as a unique approach, has transformed the role of homework and classroom activities. In the traditional teaching method, students learned new knowledge in the classroom through lectures and practiced them at home. In the reverse learning approach, students learn the material at home through videos and practice the skills in the classroom (Aprianto et al., 2020). Using social networking, the flipped learning model provides an active and interactive learning environment in which the teacher acts as a facilitator and guides students as they apply concepts and actively and creatively engage with the subject matter (Davies et al., 2013).

When the teacher designs and presents a video file appropriate to the subject of the lesson, classroom time is focused on student participation (van Alten et al., 2019). Active learning is done through questions, quizzes, discussion, round table and exploratory activities, art and application of ideas, which play the main role in the flipped classroom model. Nowadays, in classrooms, we can no longer reverse education by reading from books and expressing content in class (Mellati et al., 2015b; Blair et al., 2016). Many students come to class unprepared and teachers do not know how to engage them. Subsequently, it is not enough to say read a chapter of the book and come to class. If the teacher does not have a practical plan to do in class time, all he can do is re-present the same material, effectively implying to students that there was no need to read before class (DeLozier and Rhodes, 2017). For this reason, some teachers at some point decided to prepare video files and send them to their students before class through social media. This enables them to be familiar with interactive methods with the content given to them by the teacher and checks the files as often as they needed, and in return, in the classroom, they gave their teacher the opportunity to present new, experimental and active methods (Attarabeen et al., 2021).

In the traditional education system, the teacher is forced to advance the lesson at an average level, which causes the students who learn quickly to get tired and bored, and those who learn very slowly fall behind. Individual differences and personalizing education is a big challenge, but it is the flipped classroom that allows the student to learn according to their ability (Bredow et al., 2021). It is also a flipped classroom method that allows the student to learn according to his ability. Also, in the flipped classroom method, students are rewarded for real learning. With this method, the student cannot go to the next stage with an unrealistic grade. If he does not learn it completely, he will not be able to go to the next lesson. He should work in such a way that he can show that he has learned the lesson well and completely (Demirel, 2016).

The main problem of direct teaching is that the teacher cannot respond to the different needs of students in learning through lectures. Another problem is how to test students. Different samples of the same test should be given to students so that students cannot give their tests to other students who are taking the same test later (Lai and Hwang, 2016). Because flipped teaching eliminates whole-class lectures, students no longer have to engage in activities in a fixed way. In this method, students do homework, but they do not solve problems alone at home, instead they watch videos. Of course, they can interact while watching the videos. The teacher can ask them to elicit questions from the video, take notes, or share their views on blogs or social networks (Lai et al., 2018).

However, the impact of social networks on teenagers and people at puberty is particularly important because they are a vulnerable group on the one hand and are among the most numerous users of social networks on the other hand (Webb and Doman, 2019). Based on research, 75% of teenagers have user accounts on social networks, of which 68% use Facebook, WhatsApp, and Instagram as their main social networks. Although the use of social networks has an essential role in expanding social communication and learning communication skills, its dangers cannot be ignored (Hung, 2015; Aghaei et al., 2020).

Despite the enormous research on flipped classrooms in the recent decade, little of them has informed research on language learners' attitude and challenges and benefits of using flipped classroom approach in language teaching and learning. Researchers know surprisingly little about the role of attitude in learning to teach, how flipped classroom approach relate to their students' achivement. Researchers also know little about how teachers regulate their instructions and use social media, the relationship between teachers and learners in this mode of instruction (Attarabeen et al., 2021; Shtaleva et al., 2021).

Purpose of review and research questions

The flipped classroom approach is considered as an innovative approach in language teaching and learning (Lai et al., 2018). The purpose of the present review is to understand the impact of

flipped classroom approach for teaching using social media, language learners' achievements, and their attitude toward this new instructional approach. Moreover, the challenges and benefits of employing flipped classroom approach in language teaching and learning field of study were identified. The current review is guided by the following questions:

What is the impact of flipped classroom approach on language learners' achievements?

What is the language learners' attitude toward flipped classroom approach?

What are the main challenges and benefits of using flipped classroom approach in language teaching and learning?

Methods

The search terms used in the present review were as follows: ("flip*" OR "reverse*") AND ("social" OR "media") AND ("challenges" OR "benefits"). In this way, the common phases of expressing flipped classroom (e.g., inverted classroom, flipped learning, flipping a class) as well as language teaching could be included. To be included in the present review, the studies must be published in peer-reviewed journals and written in English. The time period of our search was the last decade (January 2010–September 2021). In addition, the studies must be an empirical research reporting an implementation of flipped classrooms in any language context.

By employing the search terms, the researchers found a total of 236 peer-reviewed journal articles. Nevertheless, many articles were removed due to replication across databases. Also, many other articles were found to be irrelevant after reviewing the title and abstract, particularly those were not empirical research or did not involve language teaching and learning. As a result, 25 full-text articles were assessed for eligibility. The researchers contributed to the extraction and categorization of the data. The researchers examined the studies together in order to come to a consensus. The data included major findings, problems encountered, and proposed solutions or preventive strategies to the problems. In particular, the problems identified were analyzed and categorized. The data in each theme were then summarized and synthesized. In following sections, the researchers organized the findings based on the research questions (i.e., the impact on student achievement, student attitude, and the challenges and benefits of using flipped classroom approach for teaching using social media).

Disadvantages of employing social networks in flipped classrooms

1. **Academic drop:** students who are active in different groups and channels of social networks, their focus on the lesson decreases, therefore, one of the negative consequences of membership and activity in these networks is a decrease in

academic motivation and academic drop (Wen and Piao, 2020).

2. **Internet addiction:** social networks by attracting different users, establishing communication, and sharing information create a kind of satisfaction in users; this satisfaction increases the amount of use of social networks and causes students to depend on these networks.

3. **Cyber harassment:** Using social networks can expose students to harassment and inappropriate communication with others and cause them to be abused (Akçayır and Akçayır, 2018).

4. **Being exposed to inappropriate information:** Using social networks can expose learners to issues such as inappropriate, violent content, religious, political, and religious doubts (Basal, 2015).

5. **Violation of privacy:** If students do not check and activate the privacy settings of their user accounts in social networks, they may be abused by cybercriminals (Demirel, 2016).

6. **Creating financial and legal problems:** Failure to observe security and privacy tips in social networks by students can cause financial costs such as hacking bank accounts or publishing confidential information (Lai and Hwang, 2016).

Parents should pay attention to the fact that currently part of the students' education is done through the virtual space and different educational programs, parents should accompany and pay attention to their children's activities in the virtual space in order to prevent harm and threats against the students (Lane and Coleman, 2011).

Learning cycle in flipped learning model

The three basic stages of the reverse learning process are: knowing, interacting, and doing. Teachers should consider these three basic points in the entire educational process (Lo and Hew, 2019). By using this new method, a common characteristic appears in all groups, and that is more dynamics during the classroom. In this case, we are facing students, who are no longer just listening to lectures, but participating in the class and taking full responsibility for their own learning. In this way, they experience different ways of learning: learning by doing, learning by knowing, and learning by sharing with others (Collado-Valero et al., 2021).

In the traditional method, the teacher rarely has the opportunity to involve the students in the activity because he devotes most of his time to lecturing and explaining the lesson content. At best, an active teacher may present the book's content and images in PowerPoint format in the classroom. In other words, they just read, listen, and see pictures (verbal learning) to progress (Lundin et al., 2018). Probably, the students will eventually reach 30% of learning, but in the reverse learning

method, the teacher provides students with verbal and visual learning conditions at home by showing different and attractive educational videos and clips along with recording his speech. Then the students enter the classroom with the preparation of these two learning sources and participate in the activities designed by the teacher in accordance with the subjects of the lesson through group discussion and interaction, and with the activities, they achieve complete learning and use it in different environments (Rienties and Toetenel, 2016).

Today, students are intertwined with technology and the Internet and they are in contact with it almost every day in the classroom and especially outside the classroom and they use it in the best way. As educators, we must use this interest of students in technology and convey educational topics to children through it (Shi et al., 2020). We traditionally do not give students the opportunity to use the most appropriate technology tools to develop their learning outside of the classroom. In the reverse learning method, the teacher also pays special attention to this issue and uses technology as a good teaching tool efficiently. Places instructional videos on websites and blogs for students to view, provides students with a variety of individual activities over the Internet, and communicates with students one-on-one to provide feedback and help (Tang et al., 2020).

Project-based learning

In the reverse learning method, students examine and analyze a real issue as a project and suddenly come to the conclusion of what solution is appropriate to solve that problem (Lane and Coleman, 2011). Peer learning and teacher feedback were considered as a complementary element to the flipped classroom. These techniques allow teachers to get student feedback the day before class, so the teacher will be able to prepare strategies and activities that the student needs. The teacher can focus on the problems that exist in the way of understanding the contents. The major model emphasizes conceptual content (Wanner and Palmer, 2015).

Different aspects of learning environment

Review and discussion of selected research findings about the effect of the flipped classroom through four areas of learning, learner, instructor, and technology, which are effective factors in the flipped classroom approach, has been conducted to examine the issue from different aspects related to the learning environment.

Learning

Most of the reviewed research confirms that the flipped classroom approach has a positive effect on student learning. One of the important influencing factors is time, so that the students of the flipped class spend more time than the traditional class

(Tang et al., 2020). In fact, one of the reasons for the increase in the amount of learning in the flipped class is due to the increase in the amount of work and time rather than the teaching method. Also, in the flipped class, it is possible to receive the educational material at your own pace and repeat it for yourself and discuss the educational material in the group (Andujar and Salaberri-Ramiro, 2021). Of course, the condition of success in the flipped classroom is that the students are prepared to do classroom activities, outside and before the classroom. If this does not happen, the teachers cannot involve them in the classroom activities. The most important way to prepare students is to do homework before class. Doing homework before class instead of doing in the class makes students feel more purposeful in their home activities. Homework is a useful tool for practicing the learned skills, depicting the level of understanding of the course materials, monitoring the learning process of the learner and providing appropriate feedback during the learning process to the learners and the teacher. However, some studies also reported the lack of effect of the flipped classroom approach. Strelan et al. (2020) and Turan and Akdag-Cimen (2020) do not consider the flipped class to be suitable for basic mathematics. The reason for it was shown by Demirel (2016) in his research that the effect of the flipped class is low in subjects where the learner's basic knowledge is low. Also, Lai and Hwang (2016) did not observe a difference in the learning rate of the flipped class compared to the traditional class. One of the reasons for the lack of difference may be due to the fact that in both studies, the traditional class sometimes turned into flipped class conditions and the students engaged in group activities. In fact, the working method in the class of the control group was the same as that of the experimental group, which had class discussions and work groups which is the reason why the research results did not show a significant difference (Almaiah et al., 2020; Sojayapan and Khlaisang, 2020).

Experts and researchers in different decades believe that interaction is the key element in learning and satisfaction in online and virtual education courses. Usually, the amount and type of interaction in face-to-face classes between students and professors is a challenge. Many of the researches reviewed reported the relationship between the flipped classroom approach and students' learning by increasing the interaction between themselves and their professors (Wanner and Palmer, 2015; Munir et al., 2018; Almaiah et al., 2020; Sojayapan and Khlaisang, 2020). Another reason is the effect of the flipped classroom on feedback learning. The flipped classroom approach can help to strengthen feedback before, during, and after the class. Feedback helps the learner to reflect on the information provided and their own knowledge, so as to facilitate the correction of misconceptions and the filling of gaps in their knowledge. Also, feedback can be used to measure students' understanding of learning materials, self-assessment tests, class exercises, and group projects (Andujar and Salaberri-Ramiro, 2021). Clear, purposeful, meaningful, and consistent with the learner's previous knowledge, specifying a logical relationship is one of the characteristics of effective feedback. Providing feedback using digital technologies adds to

the richness of feedback due to the ease of interaction and the possibility of sending comments in each assessment by others. Providing immediate feedback about students' understanding of online educational materials and evaluating students' readiness to interact and participate in flipped class activities is achieved by pre-class tests (DeLozier and Rhodes, 2017; Aghaei et al., 2020).

Learners

The research study showed that the effect of the flipped classroom approach is not the same for all types of learners, so the characteristics of the audience should be analyzed before starting the course. For example, Basal (2015) has suggested to use the flipped approach in groups with little basic knowledge of the subject, because the level of interaction and involvement in the class will lead to the initial improvement of their situation and those who have less skills in the subject will benefit more (Betihavas et al., 2016). According to Lundin et al. (2018), it was found that academically strong students have no difference in the type of educational model for their progress, but academically weak students in the reverse class approach make significant progress compared to the class. In addition, the flipped class approach is suitable for students with characteristics of interest in open and flexible time, working independently, and feeling in control of learning by themselves (Tang et al., 2020).

Instructors

In the flipped classroom approach, the teacher's role changes from a mere transmitter of information to a guide of learning activities. One of the most important challenges of implementing the flipped classroom approach is its confrontation with the teacher and the traditional classroom. Despite the change of the teacher's role from instructor to facilitator in the face-to-face classroom environment, the teacher still plays a fundamental role in the effective or ineffective use of technology in this approach (Rienties and Toetenel, 2016). Experts emphasize that if teachers do not experience the pattern of using technology in their classes, it will not be possible to train a new generation of teachers who can use the new tools of information and communication technologies effectively in their learning (Shi et al., 2020). Therefore, it is necessary to pay attention to the capabilities of the trainer in holding a flipped class, because it requires higher skills than the traditional one (Tang et al., 2020). Moreover, instructors should identify students who could not do extracurricular activities or who are facing problems and intervene to solve the problem. One of the reported challenges related to instructors in flipped classes is increasing their workload in producing content and videos for students to use before class (Mangaroska and Giannakos, 2019).

Technology

One of the key areas in the flipped class approach is the employed technologies, especially in the two subjects of content production and presentation before the face-to-face class. In content production, the research review showed that the most used media is the educational video, which is actually a video of the teacher's lecture and teaching (O'Flaherty et al., 2015). To create a more effective flipped learning model, short and meaningful videos should be prepared. Using various methods of video production and combining it with other media can increase the attractiveness and interest of the student to watch the video. In any case, it is possible for the learners to control the video, and they can keep the video or watch it again according to their learning speed (Lindeiner-Stráský et al., 2020).

To investigate the flipped classroom approach fully, by reviewing all the selected researches, the researchers determined the following opportunities and challenges.

Implications and advantages of using flipped classrooms for teaching through social media

In flipped learning, the main and challenging issue is finding appropriate learning activities, projects, and assignments that require thinking skills. Of course, this case can be considered one of the strengths of this method, and it involves the teacher in the design of activities and practical subjects of classroom learning. The important thing is that in this method thinking about learning results is done instead of thinking about learning content.

Development of interaction between teacher and student

Proponents of the flipped learning method believe that this method leads to more interaction between the teacher and the student. For example, Lane and Coleman (2011) acknowledged that when teachers do not tend to stand in front of the class and speak to students, they can move around the classroom and interact with each of their students, in which case, they are more likely to understand students better and to their emotional and learning needs respond. Studies have shown that having teachers who recognize and respond to learners' social and emotional needs is at least beneficial for learners' academic development, especially for at-risk students.

Opportunity for real-time feedback

Proponents of flipped learning argue that increased interaction between teacher and student gives the teacher more opportunity to provide timely feedback. For example, a case study conducted by the Kim et al. (2014) found that during a five-week summer course where students received instruction through the Khan Academy site with direct teacher support, the teacher spent more time on learning than in a traditional classroom. Therefore, teachers could give the learners more feedback and immediately correct their misunderstandings.

Learning at individual pace

Putting teaching on the Internet enables students to learn at their own pace and according to their own needs. According to

the research conducted by Sojayapan and Khlaisang (2020) on 800 samples, this learning speed has been one of the most influential factors in the amount of learning interventions. Teachers argue that flipped learning can increasingly enhance a teacher's ability to provide differentiated instruction. This leads to students learning at their own pace in the classroom.

Meaningful assignments

Another advantage of flipped learning is that children complete assignments in the classroom in front of the teacher's watchful eyes (Seaman and Tinti-Kane, 2013). Alavi et al. (2021) found that providing opportunities for students to practice their skills in class and teacher corrective feedback was nearly four times more effective than homework, where the teacher had less opportunity to guide students during homework.

Formative and flexible assessment

Another advantage is that in this way teachers do not leave students alone with homework. Everything is done in the classroom. After a student takes a test or completes a project, the teacher gives them immediate feedback.

Changing class management

In this method, the teachers' role changes and instead of standing in front of the class and controlling the class and being in the center of attention, they guide in small groups, accompany individuals, coordinate activities, and solve their problems.

Disadvantages of using flipped classrooms for teaching through social media

Flipped learning is a method that helps teachers prioritize active learning during class time by providing some course material for students to observe and study at home or outside of class. However, this educational strategy, like other methods, has challenges that we can better solve by identifying them.

Flipped learning is a new approach

The implementation of any new method faces various problems in the first days. Regarding reverse learning, one of the most important challenges is the newness of this method and the unfamiliarity of students with this method and its goals. They may not understand the method and logic of the new classroom, and most importantly, they are not used to learning outside the classroom. The solution to this challenge is that before implementing this method, talk to the students about it so that they experience less confusion in the first days. Explain the purpose of reverse learning to them and assure them that you are not going to leave them alone. Also, assure them that if they have problems understanding the lesson content at home, there is no problem and you are going to solve this problem in class as a group.

Active communication in educational videos

Usually, in the reverse learning method, video content is not presented live in an online class. Rather, pre-recorded video educational content is used. If these videos and other types of educational content are not attractive enough and cannot attract the attention of students, reverse learning will not work well. Also, teachers should note that when recording video educational content, they should teach as if the students are in front of them right now and teach in an active manner. In this method, also try to divide the extensive educational contents into short parts, for example 6 min, so that they are not heavy and it is possible to create a sense of some kind of interaction.

Lots of assignments from reverse learning challenges

You should never allow students' workload in flipped learning to exceed the workload in a traditional classroom. In fact, this time should be the same as the students used to do their homework at home. Another important point is that students spend more time watching a video than it actually does because they are constantly pausing and rewinding the video to better understand it. Therefore, each video should not be more than 20 min or at most 30 min.

The need for communication outside the classroom with educational coaches

Some students complain about not being able to ask questions to the teacher during recess before class. In fact, if you expect students to be able to use the understanding of the content outside the classroom for the time in the classroom, you should be able to provide them with the best facilities for learning outside the classroom. One of these facilities is increasing communication outside the classroom. This work is provided by creating online groups and forums or using online text, audio or video chat facilities using integrated educational software or even social networks.

The overwhelming work for teachers is one of the important challenges of reverse learning

Although there is a large number of pre-existing educational videos on the Internet, some teachers complain that they are not easy to find. Sometimes, these videos or audio educational content or in the form of photos, PDFs and infographics do not fully match the content desired by the teachers for education. On the other hand, the recording of video files by the teachers themselves is a time-consuming and costly task, and in fact, it is not among the duties of the teachers, unless the appropriate time and budget are considered for this task.

The collection of these cases can be summed up in the phrase "exhausting work for teachers." There are several solutions for this situation: including the involvement of managers and considering the appropriate budget for this method and creating or purchasing suitable educational content and another solution is to provide or

create the necessary content not necessarily all at once, but gradually.

Discussion

The present review overall suggests that the students in language flipped classrooms would have a better achievement, or at least performed equally as in traditional classrooms. This finding was similar to the conclusion of some previous reviews of flipped classroom research in higher education (Betihavas et al., 2016; Aguilera-Ruiz et al., 2017). Unlike some higher education contexts such as Hung's (2015) review study on chemistry flipped classrooms, the present review cannot draw an overwhelming agreement that students liked the approach language teaching. While student attitude toward flipped classroom approach was generally positive, some studies reported that a few students preferred traditional teaching approach because of the inability to ask questions during video lectures and students being accustomed to traditional instruction (Kim et al., 2014). In particular, Lai and Hwang (2016) found that their students generally reacted negatively toward the change of instructional approach. Meanwhile, the student satisfaction in their flipped classroom was thus significantly lower than that in its traditional counterpart (Lee, 2020).

Flipped classrooms challenges in language flipped classrooms were similar to higher education (Lo and Hew, 2019). First, flipped classroom approach requires a high initial cost particularly regarding the production of instructional videos (Rienties and Toetenel, 2016). Second, teachers should be sufficiently trained in using flipped classroom approach in order to put this approach into full use (Mellati and Khademi, 2018). When compared with higher education, more operational challenges were identified in the contexts of language teaching. Similar to what Shtaleva et al. (2021) found, a few students in language flipped classrooms also suffered from limited Internet access. They may also encounter technical problems and require supports from schools when operating their flipped course (Turan and Akdag-Cimen, 2020).

Conclusion

This research was a review to investigate the use of the flipped classroom approach in higher education. Reviewing the conducted research helped to better understand the capabilities and weaknesses of using the flipped classroom approach to teaching and learning in higher education. Moreover, the review and analysis carried out on the research conducted in this field can be used as a guide for further research. Furthermore, the findings of this research highlighted the different effects of flipped classroom implementation and blended learning on learning performance. Designing a flipped classroom makes a difference in terms of improving student results with a larger effect size compared to traditional education and electronic learning.

Students can spend enough time watching the lectures, enough preparation before participating in the face-to-face meeting where they are active in solving problems based on guided questions. These students receive immediate feedback from the instructor based on guided questions. In fact, the flipped class is an effective combination of online and traditional education for proper use of class time and outside of class (Aghaei et al., 2020).

By designing and implementing a quality curriculum based on the reverse learning approach, we can provide many opportunities for students and teachers to learn and teach. This approach can give students a freedom in learning. Learning in this method is formed more deeply so that it enables students to achieve high level learning. Classrooms also change from a passive and static state to an active and collaborative environment. Interaction and cooperation between teacher and student and students with each other is created and classroom time is used in the best way. Evaluation methods also change from the closed and one-dimensional mode of examination and standardized tests to the real evaluation of the activities and overall results of real learning. Real, timely, and effective feedback is provided. Meaningful assignments are designed. As a result, students become independent and responsible learners who will continue to learn after graduation and will use their learning in the best way in different situations.

Since this method is becoming increasingly widespread in universities and schools, this study is useful for researchers and educators in various fields. In addition, the teachers who are interested in the students' involvement, the reverse class approach is suggested because these classes bring back the interest in the activity to the class with their active approach. It is suggested that the textbooks be redesigned in accordance with the flipped class, in such a way that more of the content is assigned to homework.

Further studies

It is suggested to conduct other studies with the criteria that caused the research to be excluded in this research. It is suggested that other researchers investigate the effectiveness of this method on the variables of learning styles, cognitive and metacognitive strategies, and dimensions of self-regulated learning. It is also suggested to check the effectiveness of this method in different environments and learners with different levels (beginner to advanced). Attention should be paid to the gender of the audience, the year of education of the learners, the level of ability of the learners in asking questions, the structure of the class, the way of dividing people in the classes and the class discussion.

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Exploring social media technologies for novice EFL school teachers to collaborate and communicate: A case in the Czech Republic

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With an increasing number of international schools, traditional EFL teaching methods may not satisfy students' needs. This study aims to investigate perceptions of social media technologies (e.g., Web 2.0) and willingness to adopt such technologies to collaborate and communicate in multicultural classrooms among novice EFL schoolteachers in the Czech Republic. The participants were 100 novice EFL schoolteachers in Prague and the South Moravian regions of the Czech Republic. The study used a mixed research method consisting of a survey (stage 1) and a semi-structured interview (stage 2). The survey examined the participants' appraisal and concerns of using social media technologies to collaborate and to communicate as well as the level of willingness to use social media technologies. A hierarchical cluster analysis using participants' responses regarding their attitudes and behavioural tendency towards using Web 2.0 social media technologies in language classrooms identified three clusters of teachers. The teachers who were most likely to adopt social Web 2.0 technologies were those who had the highest ratings on both appraisals and concerns regarding the use of social media in language classrooms. The results from the semi-structured interviews were consistent with those from the survey. Together, the results from the two stages demonstrated that most pre-service teachers favoured using Web 2.0 technology for collaboration and communication among colleagues and stakeholders in a broader community, but they displayed contrasting levels of appraisal of and concerns towards using social media technologies. Participants believed that this might be due to their different levels of ICT proficiency, workload, and working environment. The political and practical implications in K-12 education in the Czech context are also discussed.

KEYWORDS

Web 2.0 technology, novice teachers, EFL teaching and learning, multicultural learners, education reform

Introduction

With an increasing number of migrants, the Czech Republic has seen an influx of multicultural and multilingual families, international students, and skilled workers. Traditionally, schoolteachers used face-to-face methods to teach English language courses. However, the Czech Statistical Office (2018) reports that the total number of migrants increased significantly faster in the Czech Republic than in other countries in Eastern and Central Europe. English proficiency is believed to be a key factor for migrants and their children to be engaged in a multicultural community and may influence their academic studies in the Czech Republic. Moreover, schoolteachers used to communicate with parents *via* written records rather than using digital technologies. That is, parents' only way to know how their children performed in school is from paper records, and feedback given by parents is based on these records as well. In the long term, the lack of efficient communication is not beneficial for building collaborative partnerships with families (Li et al., 2019). In this case, efficient EFL teaching methods need to be considered and prioritised to meet students' needs so as to promote the lifelong learning of individuals across different educational and career paths (Ministry of Education Youth and Sports, 2007; Czech Ministry of Education, 2014).

In addition to the inefficient communication methods mentioned above, language teachers' attitudes, such as their willingness, their self-belief in their digital proficiency, and their attendance of professional development programs may influence their choices of using social media technologies in their classrooms. Their motivation and behavioural tendencies have been discussed *via* the Technology Acceptance Model (TAM), which has been widely used to understand teachers' belief in terms of using technology (Davis, 1989; Teo et al., 2007). Davis (1989) believed that individuals' job performance could be enhanced *via* their perceptions of usefulness utilising a particular system and the perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" (p. 320). This model has been used in language education studies in recent years. For example, Liu et al. (2017) found differences in attitudes towards ICT usage among Chinese EFL teachers based on their previous digital experience or belief transmission regarding student learning. Given that knowledge is distinct from beliefs (Calderhead, 1996) and that attitudes towards use vary by technology type and language competency (King and He, 2006; Jin, 2017; Lai et al., 2017), whether the same relationship between teachers' attitudes and their social media choices (behavioural tendency) can be found remains to be seen. This study is based on the TAM model, which aims to explore the relationships between novice EFL teachers' attitudes and behavioural tendency to adopt social Web 2.0 technologies in language classrooms, and is set in the Czech Republic. This study will make significant contributions by providing first-hand data for decision-makers in the development of strategic education policy in terms of language teaching pedagogy and teachers'

professional development in the Czech context. In addition, this pioneering study will serve as a guide for future researchers who undertake projects in a similar historical-cultural context. Specifically, this study is guided by the following research questions:

1. How do Czech novice English teachers' attitudes towards and behavioural tendencies regarding the use of social Web 2.0 technologies in language classrooms differ by their self-rating of their information technology proficiency?
2. What are Czech novice English teachers' profiles in terms of their attitudes towards and behavioural tendencies regarding the use of social Web 2.0 technologies in language classrooms?
3. How are Czech novice English teachers' self-rating of their information technology proficiency associated with their profiles in terms of their attitudes towards and behavioural tendencies regarding the use of social Web 2.0 technologies in language classrooms?
4. What are the qualitative descriptions of Czech novice English teachers' attitudes towards the use of social Web 2.0 technologies in language classrooms?

Literature review

Teachers' attitudes towards and behavioural tendencies regarding the use of social media technologies

With the development of digital technology, social media has played a key role in EFL learning and teaching in the 21st century. Teachers' appraisals of the adoption of social media technologies may increase students' and teachers' engagement, collaboration, and communication. For example, Yost and Fan (2014) investigated perceptions of early childhood (EC) educators and teachers regarding the use of Web 2.0 technologies in Australia. The findings showed that most EC educators and teachers held positive attitudes towards the use of Web 2.0 technologies in EC centres because they were able to be more effectively involved in community communication. Jung and Suzuki (2015) used a Wiki in a language programme to encourage and support collaborative constructivist learning. Their research revealed that most participants were satisfied with the adoption of a Wiki in their language learning and found that wiki-based multicultural Japanese language learning is different from the traditional Japanese teaching method. Similarly, Balakrishnan et al. (2015) claimed that university students are receptive to using social media-enabled tools as part of their learning process due to substantial improvements in the self, social influence, and functionality after using social media tools. In Europe, research studies highlight the importance of the usage of digital tools (Crystal, 2000) and

support the role of social media technology to revitalise endangered languages (Ferré-Pavia et al., 2018).

However, language teachers' concerns regarding the use of social media technologies in classrooms have also been identified in previous studies. Researchers found that teachers' negative perceptions of the adoption of Web 2.0 technologies are correlated with many factors, such as individuals' digital experience, cultural backgrounds, school context, digital proficiency, and professional training (Penner and Grodek, 2014; Yost and Fan, 2014; Alrasheedi and Capretz, 2015; Jung and Suzuki, 2015; Liu et al., 2017; Gan et al., 2021; Lu, 2022). Studies have indicated that language teachers' limited adoption of social media technologies in classrooms is attributable to their lack of knowledge regarding how to effectively integrate technology in their teaching practise (Alrasheedi and Capretz, 2015; Gan et al., 2021). Yost and Fan (2014) noted that EC teachers who were more confident and experienced in using social media tools were more likely to use them in EC centres. Jung and Suzuki (2015, p. 836) found that 'wiki-based learning can be in conflict with the more traditional, didactic ways of teaching and learning' in Korean schools. Similarly, in China, EFL teachers' intention to adopt Web 2.0 technologies has been found to be the most important predictive factor in the adoption of social media tools in language classrooms (Mei et al., 2018). A more recent study argues that teachers' lack of confidence and low level of digital literacy as well as inadequate professional development programs are said to lead to a mismatch between the conception of digital technology and the pedagogy (Li et al., 2019). Li et al. (2019) found that there was a discrepancy between the requirement of the technology skills that language teachers should have and their actual usage in classrooms. Finally, Selwyn et al. (2018) noted that many schools in less developed countries still remain "old-fashioned and pre-digital" -(p. 151) and that many teachers are "principled pragmatists" (p. 152) who have not fully and readily understood the conception of digital technology. In this regard, English language teachers' experience, digital knowledge, and workplace contexts are pivotal, as these factors may influence their understanding, attitudes, and real adoption of Web 2.0 technology.

EFL teachers' professional development programs for the use of social media technologies

Teachers' professional development has been widely studied due to its impact on the quality of teaching, and it is closely related to students' learning and achievement (Darling-Hammond, 2012). For EFL teachers, professional development is traditionally focused on formally provided courses, peer observation, seminars, and master programs (Abednia, 2012; Gleeson and Tait, 2012; Xu, 2015). However, "effective professional learning is increasingly to involve teachers sharing knowledge and experience with others" (Lantz-Andersson

et al., 2018, p. 303), particularly in the form of "participation in a network of teachers" (OECD, 2014, p. 168). Such networks are regarded as gathered groups of teachers who have a ready source of "knowledge that is situated in the day-to day lived experiences of teachers and best understood through critical reflection with others who share the same experience" (Vescio et al., 2008, p. 81). Conventional sharing experiences and knowledge have been critically argued by Schlager and Fusco (2003) in their review, which states that conventional professional development organised at the school, local, and national levels is "disconnected from practise, fragmented and misaligned" (p. 205). Compared with traditional face-to-face communication and interaction in teachers' professional development programs, EFL teachers could become more mobile, less constrained by time, and more engaged in the online community.

Although the online community has brought significant benefits to EFL teachers' professional development, concerns are also discussed in research studies. For example, data security is becoming an alarming factor that might become a barrier to the active involvement of teachers in the online community for the purposes of information sharing, identity construction, and peer interaction (Lai et al., 2011; Yost and Fan, 2014). Furthermore, the dominant role of "structured conversations" moderated by more experienced teachers is also regarded as an obstacle because their dominant positions may lead to less visibility of inexperienced teachers in the online community (Lantz-Andersson et al., 2018). Time-related issues have also been raised as concerns (Marklund, 2015; Rosenberg et al., 2016). Teachers' busy schedules and heavy workload after regular hours may leave these teachers feeling 'overwhelmed' by the regular flow of information (Davis, 2015).

Using social media technology in EFL teaching in the Czech context

For historical-political reasons, English education programs have not been developed as efficiently as those for Russian and German in the Czech Republic (Nekvapil and Nekula, 2006). Klimova (2014) noted that the main reasons of the lack of the development of efficient EFL teaching strategies were that (1) teachers did not use English fully as the target language in EFL classes (Chodera, 2013), (2) teachers are dominant and learners are more passive in EFL classes (Šebestová et al., 2011), (3) teachers do not pay attention to comprehensive language skill development, and there is a small number of qualified EFL teachers in K–12 contexts (Šebestová et al., 2011; Hrozková, 2013), and (4) EFL teaching methods in the Czech Republic are primarily administered in a traditional face-to-face way with the focus on high-stake examinations (Klimova, 2014). For these reasons, it is essential to explore an efficient way to assist teachers in changing their dominant roles, and improving their communication with students with the support of various English resources is urgent

and necessary in the current Czech K–12 context[1] (Czech Ministry of Education, 2014).

With the expansion of multilingual and multicultural schools in the Czech Republic, innovative EFL teaching methods have aroused the interests of scholars; in particular, using digital technologies in EFL teaching and learning has gained greater attention in this country. In the limited number of English publications related to this field of research in the Czech Republic, the discussion focuses primarily on three aspects: (1) factors that impact teachers using digital technologies (Hrtoňová et al., 2015), (2) the adoption of digital technology at different levels of education (Šumak et al., 2011), and (3) using digital technology in the development of teachers' professional identity and beliefs (Kutálková, 2017). Compared with the use of digital technology in higher education, its adoption in primary and secondary education depends on teachers' information literacy, their motivation and initiative, and the quality of equipment provided (Šumak et al., 2011). Beran et al. (2007) noted that teachers held a more conservative attitude towards using digital technology in the Czech Republic than teachers in the broader community. In addition, the motivation regarding and acceptance rate of the use of Web 2.0 technology in lower secondary schools are "relatively low," as teachers in the Czech Republic believe that it will bring extra work outside of their regular working hours (Kutálková, 2017, p. 1356). This was supported by the study Herout (2017), which found that novice EFL teachers did not use any social networking tools in teaching and learning in schools.

However, a large number of Czech students use social media tools, such as Facebook, Instagram, and online learning platforms, in their daily life, and these social media tools have been gaining increasing popularity among the younger generation (Herout, 2017). Due to the high popularity of the use of social media tools, they should be used for the purpose of formal education and implemented in the curriculum, as this is essential for primary and secondary education in the Czech Republic (Herout, 2016). This gap and mismatch between students and teachers in the use of social media tools in classrooms are not beneficial for communication and interaction in or outside schools. For example, study of Selwyn (2009) highlighted that social media tools, such as Facebook, mobile instant messaging, and other social networking sites, are viewed as affordable open spaces because students are more open to expressing their identity and

feel more freedom in communication with a broader audience, including teachers, peers, and community staff.

To summarise, although concerns regarding the use of social media tools have been raised in the above-mentioned literature, we cannot deny that the benefits of using Web 2.0 technologies are significant for enhancing communication with and interaction between students and EFL teachers, improving EFL teachers' online professional development in an informal way, and being favoured by the younger generation in their daily learning process. However, little research has focused on exploring novice English teachers' attitudes towards and behavioural tendencies regarding the adoption of Web 2.0 technologies in schools, particularly in the Czech context. In this regard, this study will not only make a significant contribution to fill the gap in the literature but also provide evidence for decision-makers in EFL pedagogy and curriculum development in the Czech context.

Research methods

A sequential mixed research method was used in this study. Teddlie and Tashakkori (2010) argued that the benefits of using a mixed research method include "the broad inquiry logic that guides the selection of specific methods and that is informed by conceptual positions common to mixed methods practitioners (e.g., the rejection of "either-or" choices at all processes)" (p. 5). The use of mixed research methods yields much richer data than the use of a single research paradigm and allows researchers to obtain more comprehensive insight into the research findings (Johnson and Turner, 2002). Thus, qualitative and quantitative methods can draw on the strengths and minimise the weaknesses both in single studies and across studies rather than being regarded as two extreme poles in the research paradigm.

Instruments

A questionnaire was adapted based on the previous study undertaken in a multicultural context (Authors, 2015). To ensure content validity, three novice English teachers and three research experts in the field were invited to review all of the questionnaire items to ensure readability, comprehensiveness, and clarity. The two groups of reviewers first had several rounds of discussions on which items should be included and excluded until they finally reached a consensus on all question items for the final questionnaire.

The questionnaire was composed of three sections: (1) background information, (2) participants' awareness and understandings of the use of social media tools in multicultural classrooms, and (3) open-ended questions. The first part of the questionnaire was designed to obtain participants' background information. In the second part, a five-point Likert scale ranging from *Strongly Agree* to *Strongly Disagree* was used to investigate participants' awareness and understanding of using Web 2.0

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1 In the Czech Republic, students have to complete 9 years of compulsory education, usually from the ages of 6–15 and mostly at a basic school (*základní škola*). Pupils can leave the basic school at the end of their fifth year for an 8-year *gymnázium* or at the end of their seventh year for a 6-year *gymnázium* after passing the entrance examination set by the school. There are three main types of secondary schools in the Czech Republic: general secondary school (*gymnázium*), secondary technical school (*střední odborná škola—SOŠ*), and secondary vocational school (*střední odborné učiliště—SOU*; https://www.mzv.cz/dublin/en/about_the_czech_republic/education_in_the_czech_republic/).

technologies in language classrooms. The third part was composed of two open-ended questions, which were designed to gain participants' perceptions and suggestions in terms of further development of the interactive project website.

Considering the use of the questionnaire to obtain quantitative data, a semi-structured interview was adopted that allowed participants more freedom to express their opinions of their understanding of and experiences and concerns with using social media web tools in EFL teaching. Additionally, this form of data collection benefits the researcher by collecting more in-depth data from the participants' responses through allowing them to elaborate their meaning explicitly (Krueger and Casey, 2000).

Research procedures

The research was divided into quantitative and qualitative stages. Through the theoretical lenses, an interactive website was constructed as a means to explore approaches to enabling participants to discover and have access to useful technology, be engaged in multicultural communities, be able to create English teaching and learning contents and express their identities, and interact with a broader social community. In the first stage, K–12 novice English teachers were recruited and invited to attend workshops based on their time schedules in two major multicultural and multilingual cities: Prague and Brno (South Moravian Region). The purpose of the workshops is to introduce the theoretical concepts of the study and explain the benefits of participants' involvement in the project website (Figure 1). During the workshops, the principal researcher showed the different functions of navigation bars and discussed how to link personal social media tools to interact efficiently with participants engaging with the website. The participants were allowed to explore,

interact, and communicate on the project website for two semesters (Fall 2018 and Spring 2019). After the workshops, if the participants wished to join the project, they were required to sign consent forms. All of them fully understood their rights and the process of the project. They were able to interact with peers voluntarily in the project website, and if they were willing, they could share their contact information so that research members could provide support if they had any technical questions in the process. An online survey was sent to all of the participants at the end of the spring semester *via* emails that were provided in the workshops.

During the second stage, a semi-structured interview schedule was developed based on the preferred contact methods given by the participants during the first stage. This form of interview was chosen because it provided "in-depth information pertaining to participants" experiences and viewpoints of a specific topic (Turner, 2010, p. 754). In this study, the 10 focus questions were designed for novice teachers to seek answers to achieve research goals. All of the interview questions were reviewed by local and international experts in the field to ensure that the participants would be able to understand the questions.

Data analysis

Quantitative analyses

In terms of the quantitative analyses, the first step was to explore the factor structure of the questionnaire, which was achieved through performing an exploratory factor analysis (EFA) using the principal component procedure followed varimax rotation, as it was uncertain whether the factors of attitudes and behavioural tendencies are related. The items which had high coefficients loaded across scales were deleted (Field, 2013). To
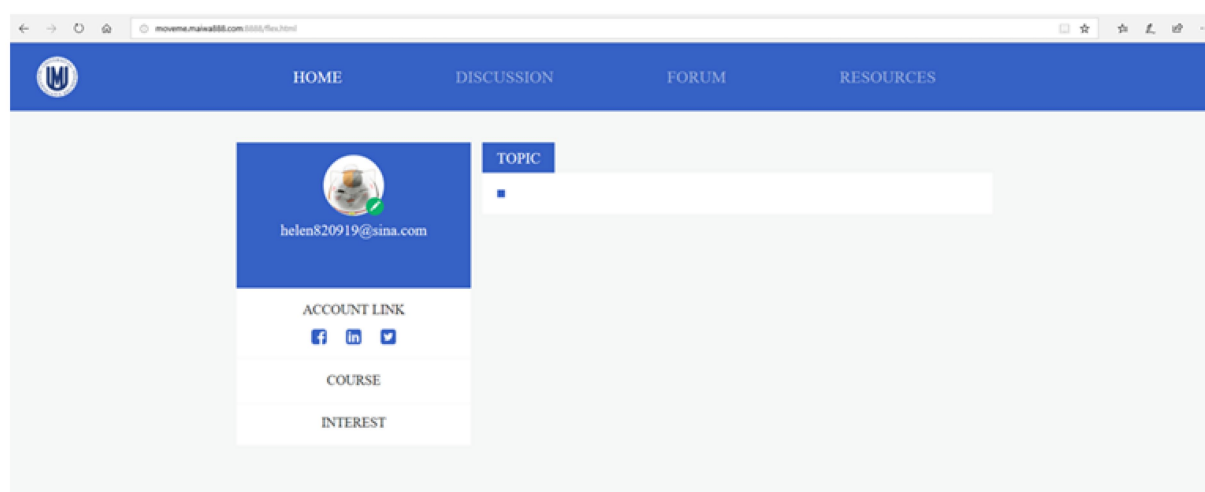
FIGURE 1
The project website interface.

evaluate the internal consistency of each scale, the Cronbach's alpha reliability was calculated. To answer the first research question—the differences between Czech teachers' attitudes and behavioural tendencies regarding the use of social Web 2.0 technologies in language classrooms according to their self-ratings of their IT proficiency—a one-way ANOVA was conducted. To answer the second research question—the profiles of Czech teachers' attitudes towards and behavioural tendencies regarding the use of social Web 2.0 technologies in language classrooms—a hierarchical cluster analysis was performed using the mean scores of the attitudes and behavioural tendency scores, followed by a series of one-way ANOVAs. For the final research question, a cross-tabulation was performed between teachers' self-ratings of their IT proficiency and their use of the clusters resulting from the hierarchical cluster analysis. All of the analyses were conducted in SPSS version 28.

Qualitative analyses

In the qualitative stage, a three-step coding process was adopted to synthesise the common items of the meaning-making process for the textual data (Creswell, 2015). The three-step coding process is based on coding approach of Strauss and Corbin (1998), which allows the researcher to read the raw data first word by word and then line by line to categorise them into various codes. Afterwards, the different codes identified were categorised into themes grounded in the data. The final step was to integrate these themes into categories to form a systematic scheme (Ryan and Bernard, 2000; Grbich, 2007). These rigorous steps ensured that the analysis and output of the data were conducted in a flexible and valid way.

Participants

After obtaining ethical approval from the university, a post on the project was sent to the K–12 schools in the two regions. All of the participants were contacted by email and signed consent forms to participate in the research project voluntarily. They fully understood their rights and the information regarding the research.

There were 112 participants invited to complete the survey online in the final study, and 100 complete questionnaires were ultimately received. The participants' information is shown in Table 1.

Table 1 shows that most participants have been teaching English for between 3 and 5 years ($n=77$) in public schools ($n=66$); however, they self-rated their IT proficiency at only an average level ($n=46$). After the preliminary collection of questionnaire data, seven participants (P1–P7) were invited *via* email to participate in face-to-face interviews. The interviewees were selected as a homogeneous group, and we believe that the sample size was adequate for qualitative research (Creswell, 1998; Saunders, 2012; Creswell and Poth, 2017). The participants who attended the interviews ranged from 25 to 30 years old and had less than 3 years of teaching experience. Face-to-face interviews

lasting approximately 30–40 min were conducted in English by the principal researcher with the help of research assistants using a small audio recorder device. The research assistants were doctoral students in the research group and had previous research project experience. All interviews were conducted in English, as the language teachers were highly confident that they could communicate in English. The audio files were then uploaded onto a password-protected computer and transcribed by the researcher. The transcriptions were distributed to the research team members for quality checking. *Via* several rounds of member checking, the research team ensured that there were no grammatical errors, after which the transcripts were ready for data entry and analysis. The interviewees' information is listed in Table 2.

Results

Results of EFA and the reliability of the scales

The results of EFA (KMO=0.91) of the questionnaire are presented in Table 3, which show that 13 items were retained,

TABLE 1 Participants' backgrounds.

	N	
	n	Percentage (%)
Gender		
Male	32	32
Female	68	68
Length of English teaching experience (year)		
Less than 1 year	8	8
1–3 years	15	15
3–5 years (not including five)	77	77
School type		
International kindergarten	4	4
Public primary and secondary schools	34	34
International primary schools	2	2
Public middle-high schools	32	32
International middle schools	1	1
Other	4	4
Self-rated knowledge of information technology (IT)		
Below average	56	2
Poor	8	8
Average	46	46
Above average	44	31
Excellent	13	13

TABLE 2 Interviewees' information.

Participants	Schools	Teaching experience
P1 (Female)	Public primary	1 year
P2 (Female)	Public secondary	6 months
P3 (Female)	Public secondary	8 months
P4 (Male)	International high school	1 year
P5 (Female)	Public primary	2.5 years
P6 (Female)	Public primary	2 years
P7 (Male)	International high school	3 years

representing three factors: two factors related to teachers' attitudes, namely appraisal of using social Web 2.0 technologies (three items) and concern of using social Web 2.0 technologies (three items); and one factor describing teachers' behavioural tendencies regarding the use of social Web 2.0 technologies (seven items). Altogether, these three factors accounted for 71.07% of the total variance. The values of the Cronbach's alphas showed that the reliability of all three scales was above the acceptable level. The details are shown in Table 3.

Results for research question 1: Differences in teachers' attitudes and behavioural tendencies regarding the use of social Web 2.0 technologies

The results of one-way ANOVAs are presented in Table 4 and show that teachers with low IT proficiency and those with high IT proficiency according to self-rating differed significantly on all the three scales: appraisal of using social Web 2.0 technologies: F $(1,98) = 12.72$, $p < 0.01$, $\eta^2 = 0.12$; concern regarding the use of social Web 2.0 technologies: F $(1,98) = 13.16$, $p < 0.01$, $\eta^2 = 0.21$; and behavioural tendencies regarding the use of social Web 2.0 technologies: F $(1,98) = 29.72$, $p < 0.01$, $\eta^2 = 0.17$. Specifically, teachers who self-rated themselves as having higher IT proficiency also had higher ratings for appraisal and concern regarding the use of social Web 2.0 technologies; moreover, they reported being more likely to adopt social Web 2.0 technologies than teachers who self-rated themselves as having lower IT proficiency.

Results for research question 2: Czech teachers' profiles in terms of their attitudes and behavioural tendencies regarding the use of social Web 2.0 technologies

Based on the increasing value of the squared Euclidean distance between clusters, a three-cluster solution was produced, with cluster 1 having 54 teachers, cluster 2 having 28 teachers,

and cluster 3 having 18 teachers. On the basis of the cluster membership, a series of ANOVAs showed that the three clusters of teachers differed significantly on all three scales: appraisal of using social Web 2.0 technologies: F $(1,97) = 63.86$, $p < 0.01$, $\eta^2 = 0.12$; concern regarding the use of social Web 2.0 technologies: F $(1,97) = 32.03$, $p < 0.01$, $\eta^2 = 0.12$; and behavioural tendencies regarding the use of social Web 2.0 technologies: F $(1,97) = 94.42$, $p < 0.01$, $\eta^2 = 0.06$. The *post-hoc* analyses demonstrate that teachers in cluster 3 were more likely to adopt social Web 2.0 technologies than teachers in clusters 1 and 2. At the same time, they also had the highest ratings for both appraisal of using social Web 2.0 technologies and concern regarding the use of social Web 2.0 technologies compared to those in clusters 1 and 2. Teachers in cluster 1 were more likely to adopt social Web 2.0 technologies than teachers cluster 2. They also had higher ratings for appraisal of using social Web 2.0 technologies than teachers in cluster 2, but they did not differ from teachers in cluster 2 on concern regarding the use of social Web 2.0 technologies. The results of one-way ANOVAs and *post hoc* analyses are presented in Table 5.

Results for research question 3: The association between Czech teachers' self-rating of their information technology proficiency and their profiles in terms of their attitudes towards and their behavioural tendency regarding the use of social Web 2.0 technologies in language classrooms

The results of cross-tabulation are presented in Table 6 and show a significant and moderate association between teachers' self-ratings of their information technology proficiency and their profiles: χ^2 $(2) = 18.49$, $p < 0.01$, Cramer's V = 0.43. Of the three clusters of teachers, the proportions of self-ratings of low and high information technology proficiency did not differ among teachers in clusters 1 and 2. However, among cluster 3 teachers, who reported having the highest tendency to adopt social media Web 2.0 tools, a significantly higher proportion self-rated themselves as having high information technology proficiency (88.9%) than as having low information technology proficiency (11.1%).

Results for research question 4: Qualitative descriptions of Czech teachers' attitudes towards using social Web 2.0 technologies in language classrooms

The qualitative data were obtained from both open-ended questions in the questionnaire and semi-structured interviews. Following the three-step coding process, three themes emerged from the participants' responses.

TABLE 3 Results of the EFA and reliability of the questionnaire.

Scales	Description of items	Rotated factor loadings		
Appraisal of using social Web 2.0 technologies (α = 0.89)	An interactive website (digital habitat) like this can help enhance the collaboration in teaching practise among English teachers.	0.72		
	An interactive website (digital habitat) like this can help improve my knowledge of technological tools used in English language teaching.	0.54		
	An interactive website (digital habitat) like this can help expand my networks within the English groups domestically and internationally.	0.84		
Concerns regarding the use of social Web 2.0 technologies (α = 0.86)	I am concerned that adoption of social media tools on the interactive website (digital habitat) can be risky.		0.78	
	I am concerned regarding the confidentiality of the information on the interactive website (digital habitat).		0.81	
	I am concerned about the quality of the resources that are provided on the interactive website (digital habitat).		0.76	
Behavioural tendencies regarding the use of social Web 2.0 technologies (α = 0.73)	I am willing to ask questions related to English language teaching and learning on this interactive website (digital habitat).			0.76
	I am willing to answer questions other people propose about English language teaching and learning on this interactive website (digital habitat).			0.75
	I am willing to share resources with others on this interactive website (digital habitat).			0.82
	I am willing to communicate with (other) experienced English teachers using an interactive website like this (digital habitat).			0.77
	I am willing to communicate with (other) parents using an interactive website like this (digital habitat).			0.83
	I am willing to collaborate with (other) school professionals using an interactive website like this (digital habitat).			0.80
	I am willing to collaborate with (other) novice English teachers on an interactive website like this (digital habitat).			0.85

Values less than.50 were removed; KMO: 0.91.

Appraisal of adoption of social media technologies

Within this category, the largest number of responses reflected "Enhancing peer communication" ($n = 58$), followed by "Strengthening novice English teachers" social networks ($n = 47$) and "Obtaining up-to-date information from a broader space" ($n = 33$). The interviewees reported that the rising popularity of smartphones and Facebook, which were streamlined with the project website, might increase their likelihood of adopting such technologies in seeking information and interaction. Participants believed that the interactive website provided them with a valuable opportunity to improve their knowledge of how to strengthen their social networks in a broad space for efficient communication. A novice English teacher commented that 'though face-to-face teaching models are still dominant, using Web 2.0 technologies are easier for younger generations to get authentic English resources'. Another participant believed that the project website provided them with an efficient way to engage with others, maintain connections, and obtain the latest information. In

TABLE 4 Results of one-way ANOVAs by teachers' self-ratings of their IT proficiency.

Scales	Low IT proficiency ($n=56$)	High IT proficiency ($n=44$)	F	p	η^2
	M	M			
Appraisal of using social Web 2.0 technologies	3.58	4.08	12.72	0.00	0.12
Concern regarding the use of social Web 2.0 technologies	3.35	3.90	13.16	0.00	0.12
Behavioural tendencies regarding the use of social Web 2.0 technologies	3.45	3.88	6.52	0.01	0.06

TABLE 5 Results of one-way ANOVAs and *post-hoc* analyses based on Czech teachers' profiles.

Scales	Clusters	M	F	p	η^2	Post-hoc
Appraisal of using social Web 2.0 technologies	cluster 1	3.93	63.86	0.00	0.12	1 > 2
	cluster 2	3.01				1 < 3
	cluster 3	4.65				2 < 3
Concern regarding the use of social Web 2.0 technologies	cluster 1	3.46	32.03	0.00	0.12	1 = 2
	cluster 2	3.18				1 < 3
	cluster 3	4.63				2 < 3
Behavioural tendencies regarding the use of social Web 2.0 technologies	cluster 1	3.83	94.42	0.00	0.06	1 > 2
	cluster 2	2.65				1 < 3
	cluster 3	4.63				2 < 3

addition, she further explained her personal reasons why she would like to be part of a broader community:

> I am a mum with two kids, and I usually consider how to develop myself in the limited spare time after work. This website allows me to link my own Facebook account to share information with other inexperienced peers, and questions were answered quickly. Being a mum and a teacher, I used it not only to interact with peers but also to engage with other parents who are in a similar context as me. They might come from different language

backgrounds, and I strongly believe this experience could help me to develop my teaching skills in a multicultural environment. (P5 interviewee)

"The project website that links with my personal social media account allowed me to obtain job vacancy information on external websites," reflected one female teacher who had just started her career. She responded that the social media tools she used in daily life might not be specific to her career information, as most of them focus on marketing and business; thus, people who had been involved in sharing information on the project website could be their potential colleagues or employers in the near future. Furthermore, she commented that her intercultural awareness has been enhanced by her acquisition of resources shared by the teachers who were involved in the community.

Other appraisals of adoption the project website in language classrooms were grouped as "Mobile-friendly" ($n=18$), 'Compatible with systems' ($n=15$), and "Easy to use" ($n=14$). A male interviewee (P2) reflected that the technology infrastructures used in these schools were more modern and advanced than those used in other public schools due to foreign investments. He responded that novice English teachers used the same teaching materials as required by their overseas partners. In this case, he believed that the adoption of the project website for use in the process of interaction would be easy for him and that the website was compatible with mobile devices as well. He further commented that the operating system would be an influential factor for him in deciding which social media tools he would like to use, as he only had access to an IOS operating system.

Concerns regarding the adoption of social media technologies

Participants' concerns were primarily categorised as "Confidentiality" ($n=57$), "Lack of digital literacy skills" ($n=40$), and "Interface design" ($n=37$). A large number of comments from the open-ended questions in the questionnaire reflected concerns regarding source and data confidentiality. An example participant's response is shown below:

> I have realised the importance of using Web 2.0 technologies in teaching and learning, but I do not feel comfortable using them in language classrooms. This might be due to school data security. If I post students' assignments or their news on the project website, I am not sure if they would be happy to have them shared. The information could be related to school policies, teaching materials used by colleagues and recordings. Even this is only for research purposes, but I still worry about it. (Open-ended question response)

Participants indicated that a lack of e-learning design skills and the unattractive interface design of the website might influence their decisions regarding the adoption of Web 2.0

TABLE 6 Results of the cross-tabulation analysis.

Teachers' profiles	Count % within the cluster	Low IT proficiency	High IT proficiency	Total
Cluster 1	Count	34[a]	20[a]	54
	% within the cluster	63.0%	37.0%	100.0%
Cluster 2	Count	20[a]	8[a]	28
	% within the cluster	71.4%	28.6%	100.0%
Cluster 3	Count	2[a]	16[b]	18
	% within the cluster	11.1%	88.9%	100.0%
Total	Count	56	44	100
	% within the cluster	56.0%	44.0%	100.0%

The different subscript letters denote the proportions of the self-rated categories within each cluster that significantly differed from each other at the 0.05 level.

technologies in language classrooms. A female interviewee shared her negative experiences with the researcher in the interview as follows:

> I completely understand that it is essential for language teachers to develop their awareness of using Web 2.0 technologies in classrooms. However, most of my colleagues and I were not confident in using those tools efficiently in language teaching. For example, I do not know how to embed the online resources successfully in my current teaching materials. Teachers were pushed to teach everything that was based on language textbooks, and students had to finish assignments. I am not sure if these would efficiently help them in a 45-minute English class, as students' performance was evaluated by examinations. Additionally, the website design is not very attractive. The interface is a bit boring. If the design were more engaging, there would be more people involved. (P6 interviewee)

Professional development for novice teachers

This category was classified as the third theme. Although there were not as many responses as for the first two categories, there were still two subgroups that could be identified to represent participants' perceptions: a lack of internal support ($n = 20$) and a lack of external support ($n = 12$) for novice teachers' development. Most interviewees indicated that after their former employment, they were not required to finish further professional development programs, unlike teachers in the United Kingdom, Australia, and the United States. An interviewee expressed that she might not have known any innovative teaching methods and strategies if she were not required to attend professional development programs.

She believed that this was normal for novice teachers at public schools in the Czech Republic. She further commented that the reasons for this might include a lack of financial support from schools, local organisations, and communities. A male interviewee expressed his view that both internal and external support is important for novice teachers if they intend to attend professional development programs. He gave an example in his school:

> The school principal encouraged us to attend professional programs, as I am in an international teaching environment. I was provided with a little bit of funding to support me in joining a range of Language Teachers' Associations. I could have free access to the online resources and communicate with peers in forums. However, when I wanted to use innovative (new) teaching strategies in my classroom, it was difficult to gain support from parents and local communities. We need to improve parents' understanding, and sometimes, it is not an easy task for me.

Some participants believed that it would be helpful if they received support to attend professional development programs. This was evidenced from participants' responses in the open-ended questions, as in the following example:

> I am busy with my job and looking after my family. I am considering if I could be financially supported by the school to attend the online programs. This is important for language teachers to develop and obtain information from English-speaking countries.

Discussion

Based on the results from both the quantitative and qualitative stages, we found that the novice EFL teachers in this study had a strong understanding of Web 2.0 technologies and were aware that the adoption of Web 2.0 technologies is important for both teachers and learners to communicate and interact in a board community. This result is in contrast with previous research, which claims that teachers in less developed areas are "pre-digital" and not informed (Selwyn et al., 2018). These inconsistent results might be due to the participants' learning and teaching contexts, both historical and linguistic. Historically, Czech teachers have been trained in a post-soviet educational system, which provided teaching and learning resources in a monolingual way. The majority of migrants were from Slavic countries. Hence, compared with teachers from the United Kingdom and Australia, the teachers in the study have not been provided many opportunities to be involved in a multicultural teaching environment. Generally, the project website provided an opportunity for them to seek information and interact with peers, which could enhance their teaching and learning skills in their professional jobs. This finding is consistent with those of other studies (Yost and Fan, 2014; Authors, 2015; Carpenter et al., 2016;

Lau, 2018; Godhe et al., 2020; Lu, 2022). Web 2.0 technologies have revolutionised communication and the dissemination of information (Holt, 2011). People merely need to click navigation bars to obtain a large amount of information, communicate and interact in a timely manner, and be instantly engaged in the broad community. In addition to its friendly user interface and instant communication, the interviewees noted that being engaged in the broader community, as the project website offers, may also support language teachers' further involvement in the multicultural community. This result accords with research studies that focused on creating an intercultural community by using social media (Veronis et al., 2018).

Support for being involved in an online community indicates that participants have a strong willingness to communicate and develop their skills in this informal way due to the low cost and high efficiency. This result is similar to that of studies that highlighted the advantages of the development of online informal professional communities using Web 2.0 technologies (Marklund, 2015; Lantz-Andersson et al., 2018). In the study, participants who had a higher self-reported ICT proficiency level felt more confident in using social media in language classrooms, and vice versa. As a consequence, their ICT proficiency influences their motivation and willingness in relation to the adoption of social media tools for teaching and learning. This finding supports previous studies undertaken in Asia, which indicated that teachers' motivation and intention are essential metrics to measure whether the usage of social media in language teaching will be successful (Mei et al., 2018).

The participants mostly expressed concerns regarding confidentiality. In this study, the context involved school policies and information from students and colleagues. As recognised in previous research (Lai et al., 2011; Yost and Fan, 2014; Li et al., 2019), the participants were also concerned about personal data security. School teachers need to be responsible for managing students' profiles and reporting their learning outcomes to parents. In this process, parents might be interested in sharing their children's information with others. In such a case, the use of social media tools was conditional and determined in accordance with the extent of security and privacy that might be afforded. Except for this reason, most novice English teachers showed a strong willingness to spend their spare time interacting with parents and more experienced teachers in the multicultural online community, which does not accord with the results of previous studies (Rosenberg et al., 2016) that have argued that 'work overload' and 'limited spare time' influence teachers' engagement in online communities as well as their adoption of Web 2.0 technologies in the Czech context (Kutálková, 2017).

Limitations

This study has several limitations. First, it is an explorative study, and the majority of participants were from the two largest regions in the Czech Republic: the Prague and South Moravian regions have larger populations and potentially a better economic status than West Bohemia and rural regions. Future studies could focus on in investigating teachers' digital habitats in less developed regions, which might generate more interesting results. Second, we did not explore more experienced EFL teachers' digital habitats due to our limited research budget. A comparison of novice and experienced teachers' digital habitat might assist researchers in developing a better understanding of the disparity of their behaviour and preferences in regard to using social media web 2.0 tools in classroom teaching. As a consequence, this may help decision-makers initiate English cubiculum reform in the Czech context.

Implications

The findings from this study have both political and practical implications. Teachers' having conservative attitudes is not beneficial for the innovative curriculum form. In this study, a number of significant policy issues and practise implications were found relating to English learning and teaching in K–12 education in the Czech Republic. Two prominent implications were discovered: the EFL curriculum in the Czech educational system and raising awareness regarding the use of social media in language teaching in multicultural schools. Currently, English is a compulsory subject taught as a foreign language in K–12 education. According to the Ministry of Education Youth and Sports (2007), the requirements for basic English language education are based on the Common European Framework and include achieving a English satisfactory level (A1 or A2). Additionally, the language curriculum used in individual schools should be developed based on the National Educational Programs. In this case, enacting any innovative reforms regarding the development of EFL curriculum, teaching methods, and teaching materials is difficult due to restrictive school management. EFL teachers must follow the traditional ways of teaching students face to face, and students are primarily evaluated *via* written assignments and final examinations, which may lead to the devaluation of the adoption of social media tools in language classrooms, as it does not yield direct benefits to schools, teachers, or students. Moreover, many teachers have few opportunities to interact and communicate efficiently with parents in multicultural families due to the lack of digital technologies. Beran et al. (2007) claimed that financial support is essential when technology equipment is needed in classrooms.

In teaching practise and daily management, supervisors' management and teachers' development programs should be developed at the school, state, and national levels. At present, fully employed novice EFL teachers are not provided with mentors, which results in a lack of supervision by the schools. In this case, inexperienced teachers may easily feel vulnerable if they cannot obtain sufficient support at work. As a consequence, teachers' stress and other negative emotions can influence students' cognitive development, such as professional development of the skills essential to employ social media tools in EFL

classrooms (Hayes, 2003). According to Bakkenes et al. (2010), innovations in school have often failed because teachers' learning and development have not been given sufficient attention. In this regard, teachers need to be supervised by more experienced mentors on a regular basis to develop language teaching skills both online and offline. Herout (2017) argues that social media tools should be embedded in formal education and daily teaching because of their popularity among the digital generations. Additionally, in a global nexus, using social media tools in language classrooms is beneficial for the development of students' intercultural awareness and multilingualism as well as their multicultural identity. It is urgent for decision-makers to consider these potential factors in the new round of language curriculum development and reform; otherwise, EFL teaching methods, teachers' digital literacy skills, and language evaluation could be left far behind those in developed countries in Europe.

Conclusion

This paper examines novice English teachers' perceptions of how one type of social media technology, Web 2.0 technology, can be used to facilitate collaboration and communication in an EFL teacher community in the Czech Republic. Generally, teacher held a positive attitude towards the adoption of social media tools in interaction, communication, and professional development. Concerns remained regarding data confidentiality and e-learning design skills. Notably, novice EFL teachers' ICT proficiency level is a factor influencing the participants' understanding, awareness, and concerns regarding their digital habitats. The higher the level of their ICT proficiency, the fewer concerns teachers have. However, the reasons why participants with higher levels of ICT proficiency show more interest in training or further development programs using Web 2.0 technologies remain unclear in the current study. We suggest that future research studies be developed to investigate factors that correlate with teachers' decisions to use social media tools in English language teaching in the Czech Republic.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Committee at Masaryk University (MUNI). The ethics committee waived the requirement of written informed consent for participation.

Author contributions

JL conceptualized, collected, and analyzed the data and drafted the paper. FH completed the quantitative data analyses and revised the survey and the draft. TJ provided the guidance and revised the paper. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Boosting EFL learners' commitment and enjoyment in language learning through social networking: A literature review

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Social networking applications have been designed as innovative technologies used by the higher education section to enhance the acquisition of literacy skills, driving learners to engage in online learning platforms. Such tools such as social networking have also been proven to facilitate teaching and learning; therefore, educational programs and universities are increasingly making use of networking sites to form connections with students and to offer online instructional content. This trend has placed questions, regarding the effect of social media on language learning and its potential use as an effective instructional tool. The constructive role of enjoyment did not obtain equal academic consideration in the EFL learning milieu until Positive Psychology was presented to L2 education. Using social networking, users find online tasks appealing and experience the enjoyment that, in turn, impacts their behavioral intention to use them positively. Commitment is another factor that refers to the degree to which students are involved in learning enthusiastically. This construct concerns the extent to which students are loyal to learning, textbooks, and class etiquette. As it contributes to the quality of learning, it is considered a prerequisite for students' academic success and educational attainment. Based on the role of the above-mentioned constructs in language learning, the present review tries to consider the role of social networking in boosting EFL students' commitment and enjoyment. Consequently, some implications are presented for academic stakeholders in the quest of considering the role of social networking in language education.

KEYWORDS

EFL learners, language education, social networking, well being, commitment, enjoyment

Introduction

Today, technology is used widely to integrate formal and informal education in the context of L2 learning and teaching (Khabir et al., 2022b). This allows the learners to benefit from the advantages associated with the effective application of technology both inside and outside the classroom (Botero et al., 2018). Accordingly, an increasing number of

researchers have tried to shed light on the contributions of technology to the quality of L2 learning (e.g., Lee et al., 2016; Lai et al., 2018). The higher education institutes have adopted internet-based learning, i.e., virtual learning, in their different academic programs to enhance learners' access and engagement while such technologies decrease costs and also bring about enjoyment and meaningful learning opportunities (Yang and Wu, 2021). Of much technological advancement, social networking Apps and their role in L2 learning have been in the spotlight that can enhance interactive contacts and the transmission of information with others in a virtual manner (Eid and Al-Jabri, 2016). Despite these advantages, the rapid use of these networks has raised concerns among many professionals, including experts, professors, and researchers regarding the efficacy and potential impact faced by students due to their obsession with online networking sites (Yapıcı and Hevedanlı, 2014). They believe that the incorporation of technologies into L2 learning courses in combination with traditional methods contributes to the general learning progress of the learners.

Given the development of cell phones and the widespread use of mobile devices, today, mobile social networks have emerged as the main channel of interaction among individuals (Zhou and Li, 2014). In recent years, the impact of mobile social networks on user behavior has caught the attention of researchers. Learners have chosen to use more than one account on social networking, which undermines their educational performance and influences their daily lives and sociability (Chen and Bryer, 2012). In the same vein, Chartrand (2012) maintains that social networking plays a role in increasing students' enjoyment, motivation, and eagerness for L2 learning. Indeed, affected by Positive Psychology (PP), the scholars working in the field of Second Language Acquisition (SLA), as well as practitioners, have attached more importance to positive emotions than to negative emotional experiences (MacIntyre et al., 2016; Wang et al., 2021). Of multiple positive emotions (e.g., self-confidence, self-efficacy, esteem, enjoyment, etc.) experienced by L2 learners in different contexts (Dewaele and MacIntyre, 2016; Piniel and Albert, 2018), enjoyment has been in the spotlight given that it is deemed by L2 researchers as an essential component of achievement emotions that it is worthy of investigating as a result of its critical function in effective language learning (Piechurska-Kuciel, 2017). Li et al. (2018) characterize enjoyment as positive feelings emanating from going beyond homeostatic limits to fulfill something new or even innovative particularly, amid difficult tasks. Following the framework of a triple taxonomy of achievement emotions, one can categorize enjoyment as a positive, invigorating, and activity-oriented emotion, which has been realized to impact students' academic achievement positively (Piniel and Albert, 2018).

Academically, the use of social networking enhances both the student's motivation to learn, as well as the learning atmosphere in the classrooms. This is because such networks lead to the establishment of new relationships between learners and their teachers, or between peers (Wang, 2013). According to Cain and Policastri (2011), studies are more interesting or motivating when they are embedded in social networking as such networks enable the learners to feel and consider the presence of experts, in posts or videos. This ultimately makes the subjects more appealing to the learners that refer to their commitment that regards the level of physical and mental energy expended by the learners regarding their academic experience. In this context, several research investigations determined that the application of social networking as a teaching or learning tool can be expected to enhance learners' commitment levels (Kaur et al., 2012; Al-Rahmi et al., 2014). The users of such a type of technology are likely to focus more on its hedonic use (e.g., enjoyment) than its educational use. A recent investigation concentrated on enjoyment as a determining factor refers to the role of social networking as a cause of enjoyment and pleasure (Sledgianowski and Kulviwat, 2009). Additionally, Csikszentmihalyi (2008) viewed enjoyment as an essential element of flow experiences whose main features are a high level of participation and engagement in a task, and which are conducive to L2 learning and development. Consequently, researchers need to examine how such constructs such as enjoyment may be impacted by the users of mobile social networks.

A review of the related literature shows that enjoyment has been deemed as a positive outcome, which may result in the people's acceptance of specific information systems, a high level of satisfaction among them, a higher level of interaction with social network websites, and a constant focus on its real value (Sun et al., 2014). Likewise, one cannot ignore the significant role of enjoyment in learning. Accordingly, recent investigations have sought to clarify its theoretical implications for purpose of obtaining learning outcomes (Luczak and Kalbag, 2018). Some investigators have made a connection between learners' enjoyment and their satisfaction or fun (Bashori et al., 2021).

Although Mobile-learning and social networking have received little attention in their language learning settings in previous decades and only a few schools care about them (Hockly, 2015; Kent et al., 2016), due to the Corona Pandemic, more attention is paid to it lately (Altam, 2020; Ying et al., 2021). Indeed, research has identified some features of social networking that contribute to the advancement of skills for communication between peers and school teachers or faculty members. They improve engagement, interactions, peer support, and commitment to educational tasks (Tiryakioglu and Erzurum, 2011). Seemingly, learners who cannot comply with new learning conditions and developments would encounter multiple challenges (challenges related to academic adjustment, social accommodation, emotional adaptations, and commitment to learning). Learners show more interest and commitment when they are valued, understood, and engaged in learning; consequently, commitment has drawn the attention of many researchers (Ahmad et al., 2017). Furthermore, there is a consensus among them to consider some types of emotions such as enjoyment as sociocultural products. They are formed and embedded in social interactions (Swain, 2013). Given the significant role of enjoyment and commitment in L2 learning, some studies should be carried out on how enjoyment and

commitment are realized and evolved during learning. More specifically, the contributions of these two constructs have not been investigated concerning social networks. Consequently, this review seeks to deal with the application of social networking, with a focus on its effect on EFL learners' enjoyment and commitment.

Review of the literature

Social networking

Social Networks have the power of changing how people engage in communication with each other (Villafuerte and Romero, 2017). As special forms of communication, they provide online communications manifested in programs such as Twitter, WhatsApp, and Instagram (Albashtawi and Al Bataineh, 2020). Accordingly, these technologies are deemed fast chatting ones that involve the provision of internet-based services. They are used to create personal profiles, post content, and interact with peers and teachers (Meng et al., 2017). As stated by Isisag (2012), new technologies and social media help to enhance the quality of foreign language learning (Mâță, 2014). For example, social networking can improve the students' learning process. Social media has emerged as an essential communication tool in that it enables researchers to share and distribute their information (Ajjan and Hartshorne, 2008; Mâță, 2014). They can search for their required content such as information and documents, using online social networking platforms. The same Apps can also be used to interact with their instructors (e.g., WhatsApp, Twitter, and Instagram, among others; Aljaraideh and Al Bataineh, 2019; Albashtawi and Al Bataineh, 2020). In line with a study conducted by Golonka et al. (2014), technology provides teachers with an opportunity to enhance the quality of their teaching, using various rich sources. Technology impacts teaching and learning positively, improving learners' motivation. Thanks to this technology, students can directly engage in situations where L2 is used; it makes it possible for them to engage in interaction and receive feedback from each other. Social networking is an internet-based platform that offers users multiple significant benefits like links, sharing opinions, times and information, speaking, interplay, and cooperation. Social networking is an online platform permitting users to have a half-or complete public profile accessible by society to speak, link, and talk with other mates and people (Boyd and Ellison, 2010). Social networking generally enhances discourse and interplay between people and teams throughout the world. In a review study, Trusov et al. (2009) concluded that generally, one could understand the notion of social networks easily. Such networks operate on the web, enabling users to create a profile identity and form subjective links among themselves. Liccardi et al. (2007) conducted a review of related studies and concluded that learners establish social and cultural links with each other. This makes it possible for them to share their learning

experiences and engage in online interactions. Furthermore, universities today use online activities as an integral part of their daily programs. Such social networking provides students with opportunities to share new experiences, thoughts, skills, and advice (Junco, 2015). Moreover, they enable them to have online access to new information associated with their studies that can inspire their motivation and enjoyment.

Enjoyment

Enjoyment is permanently defined as an initial/firm indicator of usage intention in hedonic information technologies, like social networking (Sledgianowski and Kulviwat, 2009). Constructive affections, like enjoyment, arrogance, and flow are taken into account as being effective in easing learning (MacIntyre and Gregersen, 2012). Enjoyment among the constructive affections is known as one of the most general constructive s that foreign language learners experience, which has gained rising consideration from scholars in the educational psychology area (Dewaele and MacIntyre, 2016; Li et al., 2018). Enjoyment refers to a feeling of consent and prize derived from tasks or succeeding in tasks (Ainley and Hidi, 2014). Enjoyment takes place when students understand themselves as skillful in doing an academic activity as well as understanding the learning procedure material (Mierzwa, 2019). The context of educational psychology usually describes enjoyment as a positive psychological mood derived from the attempts by individuals who go beyond themselves to complete a difficult or challenging thing (Csikszentmihalyi, 2008). Within the context of English language teaching, English enjoyment alludes to students' willingness to learn EFL. Particularly, in the FL learning setting, experiencing enjoyment includes focusing, clarifying objectives, and quick feedback which assists students in constructing resources (Li et al., 2018). Each student with higher proficiency compared to other peers who finally gained greater degrees of competence in the goal language indicated a remarkably greater degree of enjoyment compared to their classmates (Dewaele and MacIntyre, 2016). The structure of enjoyment includes five classes, namely, behavioral, psychological, affective, expressional, and mental (Hagenauer and Hascher, 2014). As the name indicates, the emotional element of enjoyment concentrates on affections and specifically, on the feeling of satisfaction and joy experienced when learning procedures. Moreover, the psychological dimension of learning pertains to constructively assessing the condition. Therefore, enjoyment can be taken into account as the feeling of fulfillment that is generated when fulfilling a difficult, complicated activity that motivates investigation and builds passion (Ainley and Hidi, 2014).

In addition, the motivational dimension of enjoyment alludes to students' capability to have a good feeling by motivating them, affectively and physically, to try higher future FL activities (Dewaele et al., 2018). Enjoyment alludes to the degree of involvement of Internet users in social networking because

enjoyment is the component of assessing people's decision to involve in social networking (Hsu and Lin, 2008). Enjoyment is an activity by which a person or team plays and people save pictures and videos in files and share them through one or more social networking (Eid and Al-Jabri, 2016). Nevertheless, enjoyment comprises two views: communicating with friends within the social network and assisting others (Moghavvemi et al., 2017). Internet users surely prefer tasks on social networking, since involvement increases enjoyment. Platforms for using social media offer an optimal chance for learning interplay and need higher effort in teaching entertainment (Hsu and Lin, 2008) that also cause their engagement and commitment.

Commitment

Commitment refers to the subjective association between a worker and his or her institution (Fernet et al., 2016). This construct is concerned with emotional characteristics, including focused attention, feelings, and the adoption of constructive behaviors about particular matters. Commitment can be interpreted as a learner's perseverance in higher education (Strauss and Volkwein, 2004), and academic commitment, which has recently been researched, is a multi-faceted concept (Viljoen, 2015). The majority of investigations in this area focus on the communication areas, with structural and academic commitment considered lately. Originally, a scholastic commitment was defined as the extent to which a learner is willing to invest in learning and academic activities (Viljoen, 2015). Commitment has to do with the affective variables associated with eagerness, faith, and the adoption of positive attitudes on particular things (Kim and Ok, 2009). As a sub-type of commitment, institutional commitment is concerned with general impressions, contentment, perceived sense of belonging, perspective on quality, and interest in a particular institution (Meyer and Allen, 2004). Having a strong commitment to the institution reinforces effective performance as learners obtain good marks and learners' commitment is defined as an individual's devotion to the university, allowing them to play a role in conveying and learning the culture, academic life, and campus facilities (Abduh et al., 2018).

Related studies on social networking, commitment, and enjoyment

Lin and Lu (2011) pinpointed that people are interested in employing social networking services to experience enjoyment since they consider taking part in social media as a hobby beneficial for searching for evidence and sharing it with others in need. In addition, Zhang et al. (2021) examined the development of enjoyment by following students' WeChat chats. They acknowledged some verbal languages as indicators of enjoyment such as a move to how learners used emojis and verbalized feelings with passion. There is another study conducted by Wang and Jiang

(2021) in China to investigate learners' enjoyment of virtual online learning during the COVID-19 pandemic, and the results indicated that learners had a great degree of enjoyment in an online learning milieu. Among social media platforms, Tiryakioglu and Erzurum (2011) indicated that Facebook has some features helping communication abilities with peers or faculty members, involvement, cooperation, peer support, and commitment to scholastic tasks. Moreover, it improves language education which has advantages both for learners and teachers in that it provides chances for engaging students in classes and developing their enthusiasm. Another study carried out by Resnik and Schallmoser (2019) probes the pedagogical structure focused on online cooperation, e-Tandem, which emphasizes two crucial modules for language education, including reciprocity and autonomy. Reciprocity is connected to students' commitment to their own and their peers' achievements. Al Ghazali (2020) tried to investigate the insights of students on social networking and the degree to which they take advantage of them to strengthen their linguistic presentation. The results display that social networking can contribute to the development of communication skills; however, these platforms do not work in cultivating writing and grammar. The learners stated that social networking assists them in their academic commitments and consequently leads to the progress of their communication and fluency.

Conclusion and pedagogical implications

Through developing educational platforms used beyond the boundaries of the classroom and incorporating social networking sites into the instruction, the traditional 'chalk-and-talk' mode of teaching gives way to a novel educational concept of learning. Social networking is considered a subgroup of social media and allows students to engage in two-way communication and interactions with their peers *via* web-based and mobile technologies. Put it another way, such a type of technology facilitates the engagement in educational communication embedded in a milieu of an interactive dialog between learners. These networks are appealing to millions of users, transforming how they exchange and share information (Akbari et al., 2015). As a result, the relevant sites have turned into an integral part of the learning experience. Users have at their disposal a variety of options such as video, Music and post sharing, teleconferencing, online lecture, and video chats (Yapıcı and Hevedanlı, 2014; Akbari et al., 2015). Social networks provide a situation where learning occurs interactively, as many related investigations have revealed that learner interactions embedded in the context of social network communication influence learners positively (Sánchez et al., 2014; Chugh and Ruhi, 2018). One can view social networking sites as domains established within the framework of the new learning revolution that encourages their commitment to the computer industry that entails the direct role of the students. Indeed, the application of social media enhanced participants'

autonomous motivation directly, which may be attributable to their impression that such networks made L2 learning more enjoyable and interesting compared to traditional teaching methods (Huang et al., 2016). Finding English learning enjoyable, EFL learners lower their negative affective filter that contributes to facilitating L2 acquisition.

It can be concluded the application of technology and social networking concentrates on academic activities and make learning enjoyable. This helps the students to better understand the course contents as it increases the enjoyment of learning, making it an interactive experience (Baytak et al., 2011). Also, literature shows that enjoyment facilitates FL learners' engagement or communication. This, in turn, increases their proficiency in processing L2 input and their mastery over L2 (Dewaele and MacIntyre, 2016). In particular, learners are interested in learning by doing, interacting, and discovering that it can promote learning and learners' engagement. Learners' commitment to their learning can be also reinforced through social networking. In such a context, these learners will be more eager to learn and the learners who find learning interesting will deeply engage in the learning process. Leaners' commitment can be very helpful in enhancing their discussions, negotiation of meaning, and motivation. According to Reinhardt and Zander (2011), the application of social media in EFL classrooms speeds up L2 learning. Social networking Apps as new platforms make it possible for teachers to deliver authentic and student-generated L2 content, which improves learning, confidence, and motivation within the context of interactions and collaboration (Derakhshan and Hasanabbasi, 2015). Therefore, such platforms contribute to creating enjoyable and anxiety-free learning situations, which educators can use to make learning an enjoyable experience for students (McCarroll and Curran, 2013). As a result, those EFL learners who enjoy learning can become more interested in learning; develop in-depth thinking; gain a higher level of confidence; and improve their own performance which all brings about commitment (Dewaele and Alfawzan, 2018). This study is expected to have several implications in that it would provide educators and practitioners with some insights into the essential role of social networking in increasing learners' enjoyment and commitment. Accordingly, officials in charge of developing education policies can draw on the review of the studies collected in this study to justify the incorporation of social networking in national educational programs, as this technology yields cost-effectiveness and supplements distance education that could enhance interactivity among learners. The national and local officials in charge of educational policies can benefit from this paper. For example, they can prioritize designing programs that make highly anxious learning situations more enjoyable. The review of the literature suggests that practitioners must lay the groundwork for an effective working and learning environment. This can be facilitated through using technology in general and social networking in particular as they increase learners' enjoyment, perceptions of one's efficacy, and commitment and consequently bring about enjoyment. This decreases learners' anxiety and distress

(Namaziandost et al., 2021), which in turn, leads to successful L2 learning.

Moreover, political officials in charge of educational policies as well as educators seek to lay the groundwork for the implementation of programs and instructional practices that transform the instruction, bringing about positive outcomes. Along the same line, educational programs try to reinforce learners' achievements by incorporating technology such as social networking in such programs. Indeed, the design of game-like activities, interactive inquiries, and online assessments can be integrated into syllabuses through social networking to make learning fun. Educators and teachers can boost students' commitment significantly by developing such fun-based problem-solving programs.

Furthermore, the conclusions reached by this review can have important implications for educators because they can play an essential role in creating an interesting, instructive classroom atmosphere. In the language context, teachers and educators provide all the necessary conditions for an atmosphere where EFL learners are encouraged to contribute to the activities to improve their learning. For instance, some tactics could be a good choice for teachers such as the use of various emojis and premeditated assistance in preparation, observation, and assessment. The teachers and educationists are encouraged to formulate modules that raise learners' interest. For instance, they can integrate interactive programs so that learners' interest is stimulated and their performance improves.

Moreover, the quality of teaching is at the center of attention which attaches great importance to the development of learners' syllabus through creating a supportive classroom setting and facilitating connections using social networking with enjoyment. Teachers and educators can benefit from social networking as a teaching and learning tool. They can reinforce the traditional classroom environments given that they create ample opportunities to refine the curriculum through innovative, authentic, and/or flexible learning that boosts students' enjoyment and commitment. L2 instructors need to know that modern conditions require doing away with the old style of teaching; instead, they should try modern teaching ways which require the inclusion of social networking sites to make learning effective and enjoyable for their learners' commitment and enjoyment. Given the general impression that learners find social networking an enjoyable tool for communication, it is recommended that teachers benefit from such a technology in the L2 programs. This would promote L2 learners' motivation and enjoyment and inspire life-long learning (Ebrahimzadeh and Alavi, 2016). Learning tasks reinforced by technology can increase motivation by inspiring the learners to take part in activities that are enjoyable and fulfilling and there is a consensus among researchers that collaborative activities done on social networks enhance learners' commitment to the programs and reinforce their academic achievement (Huang et al., 2016). Teachers are advised to invest more time and resources in making learning enjoyable in L2 courses. One way to achieve this goal is the application of social networking, which has proved to

be effective given that they create an atmosphere where L2 learners enjoy L2 learning. Thanks to the application of social networking, learners, teachers, and institutes can maintain their constant connections freely and conveniently. This would pave the way for the development of life-long learning, as well as the consolidation of learners' commitment to continued independent learning.

Teachers play an important role in stimulating enjoyment, which influences L2 performance (Dewaele and Alfawzan, 2018); therefore, teachers need to undergo some training programs aimed at equipping them with the knowledge of how to implement activities embedded in social interactions through social networking. Such programs enhance both effectiveness and enjoyment. Above and beyond enjoyment, the role of commitment in language acquisition is pinpointed, and it is argued that both constructs are interrelated to better language presentation. Using social networking raised teachers' involvement along with their motivation to develop materials as they took the role of the material developer which sequentially raised their satisfaction and interest in using it in teaching a language that leads to learners' commitment.

Suggestions for further research

Although this review focused on the effect of social networking on learners' enjoyment and commitment, some limitations can be taken into account by the prospective studies. For example, given this paper aims to review the literature and did not have any treatment regarding the possible impact of social networking on learners' enjoyment and commitment. This can be a concern for future studies. Similarly, studies in the future need to examine how the application of social media can also be best captured by qualitative research. Besides, more investigations must be conducted to compare the teachers' perspectives on social networking with those of students in the context of L2 learning. More investigations must be conducted on the possible contribution of the learners' commitment to

enhancing educational processes. These studies should provide insights into the negative and positive emotions, perceptions, or behaviors that impact their commitment (Rodríguez-Izquierdo, 2020). Also, more studies can be done to consider the role of different models of instruction such as flipped classrooms (Khabir et al., 2022a) through social networking to examine the issue.

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The role of web-based flipped learning in EFL learners' critical thinking and learner engagement

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The flipped learning approach with the use of social media as an emerging technology has changed the quality of learning in English as a Foreign Language (EFL) educational contexts. This review probed the effect of the web-based flipped learning approach on learners' engagement and critical thinking. The earlier studies revealed the significance of social media in developing learner engagement and critical thinking. Studies indicated that the provision of opportunities for more cooperative and collaborative learning activities, and high-quality interaction through the use of social media can be influential in developing learners' engagement. Moreover, social media platforms can provide a context for feedback, and various types of challenging tasks that can improve EFL learners' critical thinking. However, this review implicated that social media in flipped learning approach may be beneficial for instructors, learners, teacher educators, curriculum designers, educational policy-makers, and advisors to be aware of this valuable learner-centered approach.

KEYWORDS

social media, flipped learning, critical thinking, learner engagement, EFL learners

Introduction

In recent years, educators have used the technological developments in education to create a more effective learning environment in which learning does not seem to be limited to the classroom environment and teachers may not be obliged to spend most of the class time delivering lectures and instead, they can have tutorial roles while students can also take different roles and be more actively involved in the learning process (Tan et al., 2017). One of the instructional approaches that follows this technology-related learning approach is flipped learning because it utilizes technological tools, including recorded lessons and videos, to create more engaging experiences for learners. The concept of flipped learning is that the teacher-student roles are changed in a way that the amount of direct instruction presented by the teacher during class time is minimized while the cooperative and collaborative contribution of students to the teaching process is maximized in class (Bergmann and Sams, 2012). The flipped learning is an educational approach that inverts the operation of the conventional classroom by presenting the educational substances typically online, involving the students in cooperative group learning or potentially basic

critical thinking exercises completed under the educator's direction amid class.

Researchers have further revealed that with an effective design of learning activities, teachers can instruct students to comprehend, analyze, and even solve problems through discussion with classmates and teachers in flipped learning (Lin et al., 2021). From the perspective of social constructivism, interaction with peers implies better opportunities for sharing and constructing knowledge (Al-Qaysi et al., 2021). This implies that guiding students to interact with peers with proper support will enable them to perceive things from diverse perspectives and make reflections, which is beneficial for them to develop higher-order thinking capabilities, including problem-solving and critical thinking (Saputri et al., 2019). Students' interactions with course content in all flipped learning environments can scale the top of Bloom's cognitive taxonomy, breaking away from mere memorization and application to the more demanding steps of analysis, evaluation, and creation, the cornerstones of critical thinking (Jensen, 2019). Ferrett (1997) contends that critical thinking is the ability to think reasonably, reflectively, responsibly, and skillfully of and about whatever is around. It differs from the shallow naïve thinking in which the person does not deepen into the reasons for the events around. Critical thinking, according to Benesch (1993), can be employed and taught to second language learners of English as a crucial, preliminary strategy that not only heightens the concept of democracy among and within learners, it can help enhance learners' awareness in learning language skills. Teachers ought to be aware of the capabilities in order to match technology with their instructional goals and they should know how to increase learners' critical thinking, which in turn enhances learning outcomes (Jensen, 2019).

Another major issue for educators is related to how students can become more engaged before, during, and after the flipped class period. Different factors affect students' engagement in the learning process, including teacher support, quality of instruction, peer connections, and classroom structure and management. By taking advantage of integrated technology by using it as a tool, the flipped classroom presents information prior to the classroom and, as a result, makes students more engaged with the course contents before attending the class. This review considers the studies on the effect of the web-based flipped learning approach on learners' critical thinking and engagement. This conceptual review tries to specify important perceptions about web-based flipped learning approach and give some suggestions for future research. The result of this conceptual review can improve, reconceptualize, or even replaces current views of flipped learning approach. The findings and implications of the present review will provide relatively novel insights for teachers. Exploration in this field can help educators in many aspects of the classrooms to find new approaches to become more effective teachers and accordingly make a practical learning setting for increasing learners' critical thinking and engagement in the educational context.

Review of literature

Flipped learning

Technology has become an integral part of educational environments today. As Lindeiner-Stráský, Lindeiner-Stráský et al. (2020) have suggested, the development of technology has significantly changed the ways instructors teach, and students learn. They mentioned that the teachers are willing to integrate technology into their approaches. This willingness causes a re-evaluation of teachers' instructional styles. Indeed, they incorporate technology into their teaching in order to achieve their pedagogical goals better. Amongst the numerous ways of technological-based pedagogy practices in English language learning is the flipped learning approach (Yulian, 2021). According to Guo (2019), the flipped learning approach is a pedagogical approach that encourages students' active participation, promotes support from teachers, and peers to handle homework, and allows more free time in class. Zainuddin (2017) mentioned that in a flipped classroom, learners acquire the knowledge before the class, and the class time is dedicated to practicing the knowledge through active learning and problem-based learning without spending time on presenting the content. Hung (2018) defined pre-class self-learning as the bringing of linguistic knowledge to learners' private space and time with the help of videos and related exercises. He also described the in-class activities as pair or group activities during class time. Therefore, the shift of material consignment to the outside of the class and using the class time for higher-level activities like applying and examining the earlier learned materials are the primary components of flipped learning approach (Yilmaz and Baydas, 2017). A flipped classroom enhanced by Bloom's revised Taxonomy and Cognitive Apprenticeship, gives EFL students more exposure, time, and opportunity to learn both in and outside the L2 classroom. It shifts teacher-driven instruction to student-centered learning through active learning strategies.

The theoretical foundations including constructivism (Aljohani, 2017) and cognitive load theory (Li, 2022) can justify the role of flipped learning approach by the instructors. The constructivist philosophical view of constructivism is knowledge created through communications with one another involving the society and setting (Rob and Rob, 2018). Based on constructivism theory, learning occurs when a student works either with a more skilled adult or peer to solve problems that are just beyond her/his actual abilities (Jantakoon and Piriyasurawong, 2018). Core principles of constructivism include the following: (1) learning is self-centered and self-directed; (2) learning is an active rather than passive endeavor; and (3) the instructor's role is to foster critical reflection and facilitate the application and deeper understanding of new concepts (Aljohani, 2017). Student-centered instructional approaches, like flipped learning approach, are grounded in the constructivist theory of learning in which the learner is an active constructor of knowledge based on previous experience, perceptions and knowledge (Lewis et al., 2018). The constructivist

approach in flipped learning should be an active practice, where learners must build their knowledge and make use of cooperative and collaborative learning, be given power in the learning procedure, be given chances to reflect and, lastly, gain meaningful learning experiences in order to enhance their learning based on this particular approach (Erbil, 2020). Flipped learning can contribute to the decrease of the cognitive load levels of learners. (e.g., de Leng and Pawelka, 2021; Li, 2022). Cognitive load means the resources used by an individual's working memory at a certain time (Kirschner et al., 2018). Based on the cognitive load theory, efficient instruction should have a small extraneous load and an optimized germane load (Wang et al., 2020). Kirschner et al. (2018) stated that efficient instruction increases learning outcomes and decreases cognitive load. The flipped classroom approaches provide additional opportunities to manage cognitive load by allowing the learners to have knowledge about the subject before the lesson which improves learning. Some of these are implicit in the flipped classroom approach; however, others will require educators to make certain choices when designing learning activities.

The use of social media in flipped classrooms has drawn the attention of many investigators. Pathiraja and Little (2015), generally defined social media as a "set of interactive technology tools designed to encourage social networking and dialogic communication in virtual communities and networks" (p. 585). They mentioned that social media platforms include online forums, networking sites, online professional networks, content posting sites, and research forums. Bryer and Zavattaro (2011) also described social media as "technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders" (p. 4). Veletsianos and Navarrete (2012) indicated that social media platforms can bridge the gap between technology and pedagogy in flipped classrooms. This review will discuss the role of social media platforms in EFL learners' critical thinking and engagement in flipped educational contexts.

Vygotsky's theory of mediation in digital learning is a theoretical construct of this review. Based on this theory, technology can be related to psychological and cognitive states. According to Zidoun et al. (2019), education programs should consider the role and impact of technological developments on learning. The concept of technological mediation, inspired by Vygotsky's (1986) theory of tool mediation, aims to gain insight in the ways in which technology actively co-shapes the relation between people and the world through various mediating effects. de Boer et al. (2018) explain that this understanding of technological mediation emphasizes "the primacy of the relatedness between emotional states of people, technologies, and the world" (p. 300).

The concept of critical thinking

Critical thinking is considered a fundamental component of educational activities (Thorndahl and Stentoft, 2020; Oktaviah et al., 2021). Many investigators have provided numerous definitions for Critical thinking. According to McPeck (1981), critical thinking is defined as "the propensity and skill to engage in an activity with reflective skepticism" (p. 8). Sternberg (1986) also considered critical thinking as a cognitive psychological component and defined it as "the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts" (p. 3). Gavrysh and Dotsenko (2021) declared that critical thinking is described as an individual's ability to self-assess the surrounding, reality, information, knowledge, opinions and statements of others, and the ability to find effective solutions considering existing stereotypes and criteria. Yulian (2021) also regarded critical thinking skills as the main cognitive process dimension in Bloom's taxonomy. According to this taxonomy, critical thinking includes remembering, understanding, applying, analyzing, evaluating, and creating Shubina and Kulakli (2020) asserted that critical thinking is viewed as the most common way of assessing thoughts, evaluating contentions, managing issues, making decisions, collecting and appraising different data, and concluding about particular principles to give the best solution. Tong et al. (2020) mentioned that critical thinkers reflect, relate and appraise all features of circumstances or problematic issues. They maintained that this level of thinking incorporates abilities like concentrating on components of a problem or an adverse situation, gathering and coordinating data about the problem, and recalling the understood information.

Bağ and Gürsoy (2021) stated that critical thinking skill is significantly correlated with foreign language learning achievement in which the learners are directed to determine their own motives to learn the language, set their goals consistent with their educational requirements, control their learning practice competently, and to employ proper skills of the era during the whole process. They also asserted that active cooperation, which is a vital issue in today's world, needs competent thinkers, who can interact with others in a common language to critically analyze the messages, make reasoning, and inferences and create the meaning to express their own opinions. Itmeizeh and Hassan (2020) stated some of the features of critical thinkers, include "purposeful, self-regulatory, self-rectifying, habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking precise results" (p. 2). Etemadfar et al. (2020) emphasized that good critical thinking is not an innate or natural ability for most L2 students, but it can be taught through effective pedagogical methods.

The role of web-based flipped learning in developing learners' critical thinking skills

The introduction of the flipped teaching method and digital technologies has the potential to encourage and

promote active learning, learner-centeredness, and critical thinking skills of language learners in EFL classrooms (Pasaribu and Iswandari, 2019). Flipped learning with the help of technologies attracts students to their learning procedure through supportive and problem-based educational tasks to develop their basic reasoning and critical thinking skills (Prahani et al., 2020; Lin et al., 2021). van Vliet et al. (2015) stated that learners, involved in flipped educational contexts, tend to use critical thinking strategies, such as planning, monitoring, and evaluation strategies. Using Bloom's taxonomy, Eppard and Rochdi (2017) justified the significant effect of flipped learning approach on learners' critical thinking. They argued that, in flipped learning classrooms, the independent transmission of information by the learners outside the classroom and assimilation of information entails critical thinking, analysis, synthesis and reasoning. Likewise, Ebadi and Rahimi (2018) examined the effect of flipped and traditional educational contexts on Iranian EFL learners' critical thinking. They used WebQuest, video clips and e-learning materials. Moreover, California Critical Thinking Skills Test Form B was used in order to evaluate learners' critical thinking skills. Their study indicated that flipped classrooms, compared to non-flipped ones, foster learners' critical thinking skills. Munir et al. (2018), in another study on the operation of a technology-based flipped classroom with the employment of cooperative learning, indicated that flipped classroom improves learners' critical analysis skills, problem-solving skills, and communication skills. Cheng et al. (2019) also mentioned that flipped classrooms develop a student-friendly educational context that encourages learners to engage in a classroom making teachers assign and educational time for interaction by engaging learners in numerous interactive learning tasks, such as discussions, problem-solving, critical thinking, and hands-on activities. Zou and Xie (2019) investigated the impact of two technology-based flipped learning approaches, including just-in-time teaching and peer instruction in flipped classrooms and conventional flipped classrooms on EFL students' critical thinking. Their study demonstrated that the technology-based just-in-time teaching and peer instruction flipped approaches are significant in developing learners' inclination towards critical thinking. Kawinkoonlasate (2019) stated that the technology-based flipped learning approach is a reliable way for teachers to assign classroom time to foster critical thinking, self-directed learning, communication skills, and cooperation among the learners. He mentioned that technology-based flipped classrooms can obviate the academic weaknesses of some learners and ensure the development of their thinking skills. Afzali and Izadpanah (2021) also found a significant difference between technology-based flipped learning and traditional classrooms in developing learners' critical thinking and performance. They argued that flipped instructional approach offers more communication, involvement, contribution, feedback, and various types of tasks inside the classroom context, which can foster learners' critical thinking through integrating technology in the classroom by focusing on student-centered education.

Critical thinking strategies can enhance flipped learning. Kurnianto et al. (2019) underscored the role of motivation as a mediating variable in the relationship between critical thinking skills and learning in flipped classrooms. They mentioned that the increased motivation can significantly affect critical thinking and learning outcome in flipped classrooms. Self-regulation is also another component that develops learners' critical thinking and learning in flipped classrooms. For instance, guiding learners to set their learning goals, and supporting them in monitoring their learning status in five stages, namely, goal setting, flipped learning (including pre-class video-based instruction and in-class discussion), task sharing, self-evaluation, and self-regulation feedback are influential in developing critical thinking and learning achievement (Chang et al., 2022).

Hamid et al. (2015) emphasized the importance of using social media as a platform in flipped learning, which makes increases interaction among learners. They stated that social media promotes learners' engagement, self-monitoring, autonomy, and critical thinking. Van Den Beemt et al. (2020) focused on the importance of internet-based applications, like social media, in developing learners' engagement and critical thinking. Puentes (2022) indicated that using social media develops environmental awareness, which generates a socially cooperative learning context and improves learners' basic ecological critical thinking. Ariantini et al. (2021) found the significant roles of social media, such as YouTube, WhatsApp, Facebook, and Instagram, in learners' language skills, vocabulary, grammar, pronunciation, spelling, motivation, as well as their creative, and critical thinking.

Andrini et al. (2019) indicate that the use of Information and Communication Technology (ICT) in the form of Moodle, simulation, distance learning, and utilizing social media (e.g., WhatsApp, telegram, line, etc.) in flipped classrooms, increases particular features of learners' critical thinking skill, including elementary clarification, basic support, inference, and advance clarification. Moreover, they mentioned that the integration of social media into the combination of the flipped classroom and project-based learning, as a learning approach, enhances the communication and teamwork, and encourages the learners to use critical thinking to solve their project. He and Darmawan (2018) also emphasized the role of WhatsApp in flipped classrooms in developing learners' higher-order thinking skills. They mentioned that digital-based flipped learning makes learners well prepared, more independent, and more active, which leads them to be critical thinkers. Listiqowati et al. (2022) investigated the effect of the project-based flipped learning approach on learners' critical thinking skills. They used Zoom meetings and WhatsApp as platforms used in flipped classrooms. Their study revealed that the project-based flipped learning approach with the use of social media is influential in the enhancement of critical thinking abilities. Having used Zoom meetings and Facebook, El-Glil and

Mohamed (2021) emphasized the role of social media in developing adults' EFL critical thinking.

Regarding the importance of Facebook and Instagram in educational contexts, Al Arif (2019) asserted that the production of captions, pictures, and videos to be uploaded to the students' Instagram and Facebook accounts are argued to have triggered creative thinking, along with critical captioning and commenting. He mentioned that creative and critical thinking is one of the most important benefits of Instagram's and Facebook for EFL students. He also stated that the uses of Instagram and Facebook in flipped classrooms urge the teachers to shift their teaching styles to be more active, flexible, effective, and student-centered in order to sharpen their critical thinking skills. Atwa et al. (2022) used Facebook as a platform for showing the videos and preparing learners in flipped learning classrooms to investigate the effect of digital-based flipped classrooms on EFL learners' critical thinking and academic achievement in four different subjects, including Science, Math, IT, and English. They found that flipped learning approach increased all learners' critical thinking skills, and Math achievement was evident in flipped learning classrooms. They argued that digital-based flipped classrooms help learners to comprehend deeply, retain knowledge and to use their higher critical thinking skills, rather than lower skills such as memorization and repetitions. Dewi (2022) used Instagram as a social media in flipped classroom in order to examine its effect on learners' critical thinking and writing performance. His study revealed that Instagram can pave the way for critical thinking by providing learners opportunities for commenting and uploading photos and videos. Moreover, he found that writing skill can improve by using Instagram. He argued that teachers, by using Instagram, are not required to handle the whole learning process meanwhile, they can take responsibility as a facilitator and guidance. It means students must be given an opportunity to think critically and increase their creativity about the issues which trend online. Tencent QQ is also proven as one of the social media tool which can improve critical thinking. Luo et al. (2021) indicated that the interaction between student-teacher, teachers' feedback, class hour, and communications on Tencent QQ are necessary to keep students on the right track of developing thinking skills. He maintained that students, with various opportunities of communicating with the teacher, would not feel powerless or frustrated when facing difficult tasks, thus ensuring the achievement of the learning objectives.

The concept of learner engagement

Learner engagement is described as learners' "psychological effort and investment toward learning, understanding, or mastering the skills, crafts, or knowledge that the coursework is intended to promote". Christenson et al. (2012) defined learner engagement "as effortful learning through interaction with the teacher and the classroom learning opportunities" (p. 1). Jung and Lee (2018) also defined learner engagement as learners' use of

mental energy and effort to achieve the desired performance. Learner engagement has a positive and significant relationship with academic achievement (Lei et al., 2018; Miller et al., 2021). Learner engagement is regarded as a construct of positive psychology (Derakhshan, 2021; Greenier et al., 2021; Wang et al., 2021; Derakhshan et al., 2022). Philp and Duchesne (2016) conceived engagement as a multi-dimensional construct: behavior, cognitive, emotional, and social. They mentioned that behavioral engagement has been measured with items about attention, participation, concentration, and homework completion; emotional engagement is conceptualized as the presence of positive emotional reactions to teachers, peers, learning content, and classroom activities; cognitive engagement is defined in terms of using deep learning strategies, persistence, and self-regulated learning. A fourth dimension, social engagement, was proposed to stress the importance of social interactions in learning. Reeve and Tseng (2011) also presented agentic engagement as another component of learner engagement. They defined it as learners' contributions to the flow of teaching instruction. In other words, students with higher agentic engagement are active in giving instructors their suggestions regarding various aspects of teaching in order to improve their own learning experiences. Engagement offers a more practical approach to involving students in their language learning, especially in today's digital age, where too many distractions might interfere with learners' efforts even if they are motivated (Mercer and Dörnyei, 2020).

The role of web-based flipped learning in developing learners' engagement

Earlier investigations have indicated that learner engagement is a fundamental component of enhancing the quality of education. Numerous investigations have proved the significant correlation between learner engagement and flipped learning approach (e.g., Afzali and Izadpanah, 2021; Li, 2021; Lee et al., 2022; Teo et al., 2022). In flipped learning, two modes of learning, pre-class and in-class, are based on a distinctly different approaches to knowledge and learning. In the pre-class portion of flipped learning, learners are required to autonomously engage in learning online lectures and materials in their own time and pace before engaging in the in-class learning activities. In the in-class learning portion of flipped learning, learners are required to actively participate in learner-centered activities designed to help them construct their own meaning through a deeper process of inquiry and investigation. Studies on FL have proposed ways to engage learners both in individualized pre-class learning and collaborative in-class activities (Ng, 2016). Diemer et al. (2013) have noted that pre-class engagement and in-class engagement have different learning requirements and outcomes. In addition to the potential differences in learner pre-class and in-class engagement, differences in engagement may occur at behavioral, cognitive, and affective levels. These levels are a multidimensional construct encompassing behavioral, cognitive, affective

dimensions (Fredricks and McColskey, 2012). The study of Jamaludin and Osman (2014) revealed that learners' behavioral, emotional, cognitive, and social engagement tend to be high in flipped classrooms, since they have more opportunities to work with peers, share and understand each other's ideas through group activities in flipped educational contexts. They showed that the flipped classroom allowed learners to regularly alter their ideas of English learning and accept the significance of improving their English communicative skills through collaborating with peers. Evseeva and Solozhenko (2015) also found that flipped classrooms foster learners' engagements through various technological tools. They mentioned that in flipped learning approach, learners have already been familiar with the subject, and the main notions, and have had some preparation for the subject matter, which make them more engaged in classrooms. Subramaniam and Muniandy (2019) compared learners' engagement in flipped and didactic educational contexts. Learners in the flipped classrooms were asked to watch a micro-lecture before coming to class and were involved in engaging activities in the classroom. Moreover, they used a Likert scale questionnaire, which consisted of four engagement constructs, namely behavioral, agentic, cognitive and emotional engagement constructs. They found out that learners in flipped classrooms are more engaged in terms of these constructs. Salimi and Karimabadi (2020) also indicated that learners' level of academic engagement in flipped classrooms tends to be more than of learners in traditional classrooms. They argued that learners' academic engagement as a positive emotional state is related to the innovation and distinctiveness of the flipped learning approach. They asserted that learners are uninterested in repetitive and traditional instructional aproaches, and the features of flipped classrooms, such as active learning, learner-centeredness, collaboration, and communication with peers and teachers, were all the notions that increase learner engagement. Fisher et al. (2021) also found that flipped learning positively affects learners' engagement, performance, and satisfaction. They mentioned that involvement stirred by flipped classrooms is integrally satisfying to learners. They also mentioned that intensive and strategic engagement with electronic materials before class is the feature of learners who outperform in flipped classrooms. Lee et al. (2022) investigated the role of belief and academic capability in increasing learner engagement in the EFL context. They found that learners' epistemological beliefs influenced neither pre-class nor in-class engagement, but that academic capability affected both pre-class and in-class engagement. Doo (2021), in his study, showed that flipped learning approach provides learners with flexible learning in their study, time to create individual learning, and to engage more in classrooms. However, the factors affecting learner engagement in pre-class and in-class flipped learning are not widely studied. Nevertheless, more research is needed on the relationships between each dimension of engagement and different types of flipped learning outcomes, as well as on the path by which each engagement predicts flipped learning outcomes. Moreover, more

studies are required to investigate learner engagement after flipped classrooms.

Flipped learning approach enables learners to be more engaged in the educational context to achieve all levels of Bloom's taxonomy (Gilboy et al., 2015). In flipped classrooms, student-centered goals are set and active learning strategies such as pair-and-share activities are employed in flipped classrooms. Moreover, student presentations and discussions, and individual or paired quizzes empower students to reach higher levels of Bloom's taxonomy (DeLozier and Rhodes, 2017). Creating ideas as the highest tier of thinking engages students to show their professionalized skills (Jaenudin et al., 2020). Applied to social media, Bloom's Taxonomy can be used to design exercises that facilitate specific objectives. For example, the act of searching for and retweeting course-related content engages students with course material outside of class on a platform that is already of interest. This bridges formal-informal learning and may also increase student engagement by providing an innovative assignment. Furthermore, studies show that personalizing the online learning experience is crucial to improve adult learner engagement and reducing their attrition rates.

The use of social media in flipped learning approach plays an important role in learners' engagement. For instance, Schindler et al. (2017) indicated that Facebook and Twitter affect learners' behavioral, cognitive, and emotional engagement. They argued that Facebook and Twitter are practical tools for increasing specific behavioral and emotional engagement indicators, such as interactions with others and a sense of belonging within a learning community. They also mentioned that the mandatory use of Twitter, increasing faculty involvement in Twitter, and integrating Twitter into assignments may help to increase learner engagement. In light of the pedagogical potentials of social technologies such as Telegram in designing a variety of collaborative and cooperative tasks Amiryousefi (2019) set out to examine the effects of two types of flipped learning conditions with the use of Telegram on EFL students' speaking and listening abilities and their participation and engagement with the materials and activities. His study revealed that flipped learning can help EFL learners improve their L2 speaking and listening and be more engaged with materials and activities outside of class. He argued that social technologies such as Telegram can create a less threatening learning environment compared with conventional settings, provide opportunities for more cooperative and collaborative learning activities, stretch the limits of input and output, and hence increase opportunities for high-quality interaction. Through Telegram, as the online platform of the flipped learning conditions in his study, the learners collaboratively elaborated on the learning materials during the pre-class phase of flipped learning and were hence engaged in collective scaffolding. He maintained that learners, through collaborative and scaffolding learning, can achieve beyond what they can do individually with the help of their peers and/or teachers and hence, according to Vygotsky's ZPD theory, can learn beyond their abilities. Regarding the importance of social media on learner engagement Liu and

Moeller (2019) highlighted the significance of WeChat as a social media in flipped learning classrooms. They mentioned that WeChat provides asynchronous, semi-synchronous, and synchronous online interaction, and its messaging function allows for interaction in different modalities (e.g., text, audio, and video messages). They argued that its user-friendly grouping function enables language instructors to group learners in the way that is most appropriate for achieving the intended learning objectives. This flexible grouping approach promotes engagement in online interpersonal communication either in pairs or in groups at any time, any place. Yu et al. (2022) also proved the effectiveness of WeChat on developing learners' behavioral, social, cognitive and emotional engagements compared with traditional classrooms. Some studies also proved the effectiveness of Tencent QQ, as a social media, on the enhancement of learner engagement. Luo et al. (2021) found the role of an online-based environment in promoting learners' sense of belonging and engagement. They used Tencent QQ as a professional online education platform in China. Using Tencent, learners could communicate with peers and instructors in the group, and even add instructors as friends to realize one-to-one online learning guidance. Their study revealed that the harmonious relationships by Tencent improved learners' sense of belonging and engagement in online learning. They argued that online learning environment through Tencent can provide an opportunity for learners to have learner- teacher and peer relationship, which in turn, increase learners' affective engagement. Teng and Wang (2021) also verified the importance of Tencent QQ and Wechat as the most convenient social networking system since it can enable learners to communicate academically or non-academically, and it promotes learner engagement. Piki (2020) considered the importance of Messenger, Viber, and Facebook in developing learners' language learning and nurturing learner engagement. He also asserted that the interaction on social media contributed to re-establish learner engagement which was challenged during the unforeseen circumstances caused due to the COVID-19 pandemic. Zen et al. (2019), in another study, found a significant relationship between flipped classroom method using WhatsApp and learner engagement in activities. In line with Zen et al. (2019), Badshah et al. (2021) revealed the role of WhatsApp as asocial media in learners' engagement by making a productive relationship among the parents, teachers and principal in underdeveloped countries' schools. They showed that improvements in the parental engagement and teachers' engagement result in a productive learners' engagement. They argued that interaction with parents and teachers through WhatsApp has remarkably enhanced the parents' and teachers' involvement in children' education, resulting in productive learners' engagement inside and outside the classroom. However, Reflianto et al. (2021) investigated the influence of online-based flipped classroom learning between using Microsoft Team and WhatsApp, and learner engagement on reading comprehension skills. They found out that Microsoft Team was better than WhatsApp in improving learner engagement and reading comprehension skills. They argued that great, online

learning methods with complete learning media features presented by teachers have proved to improve active learner behavior during online learning. Lee et al. (2022) investigated the effect of Zoom in flipped learning classrooms on learner engagement. They found that a synchronous online flipped learning application, such as Zoom, can encourage learners to involve in numerous cooperative activities. In general, studies showed that social media can predict learner engagement, and it can account for learners' involvement in educational contexts.

Conclusion, implication, and suggestions for further research

This conceptual review aimed to extend past research in a particular domain in a meaningful, conceptual way. The results of this conceptual review revitalized of existing theories and explored the novel conceptual insights. This review probed the role of flipped learning approach in learners' critical thinking and engagement in academic contexts. Erlier studies have shown that web-based flipped classrooms have the capability to increase EFL learners' critical thinking (e.g., Munir et al., 2018; Cheng et al., 2019; Pasaribu and Iswandari, 2019; Prahani et al., 2020; Lin et al., 2021). Previous investigations indicated that social media can draw the attention of learners by having supportive and problem-based educational tasks to foster higher-order thinking and critical thinking skill (Cheng et al., 2019). Moreover, it was also concluded that social media, such as YouTube, WhatsApp, Facebook, Instagram, Telegram, Tencent QQ, and Zoom provide the context for cooperative learning, which fosters learners' critical thinking skill. Using these types of social media platforms can develop learners' ecological awareness, which in turn ldeas to the development of socially cooperative learning, and critical thinking. This review also concluded that social media platforms enhance learners' critical thinking by engaging learners in numerous interactive learning tasks and they increase learners' inference and clarification. Social media platforms make learning more independent and active which increase higher-order thinking among learners. Earlier studies have also indicated that social media platforms, such as Facebook, Twitter Telegram, WeChat, Tencent QQ, Messenger, Viber, and Zoom can develop learner engagement by activating learners in numerous cooperative activities, raising parents and teachers' attention to learners' engagement (Badshah et al., 2021), enabling learners to communicate (Teng and Wang, 2021), improving teacher-learner relationship (Luo et al., 2021) and providing the features for making user-friendly groups (Liu and Moeller, 2019). This review also concluded that social media platforms can develop collaborative and scaffolding learning, which improve learner engagement.

This review comprises some pedagogical implications for instructors, learners, teacher educators, curriculum designers, educational policy-makers, and advisors. Based on related

literature, instructors should have an awareness of flipped instructional approach in their classes to increase learners' critical thinking and engagement. As one of the major findings of the studies was the outperformance of the learners in the flipped classrooms, the ground must be provided for expanding and appropriate use of flipped learning approach in our educational system at both institutes and schools. Moreover, web-based technologies should be used in classes in order to improve the quality of learning and teaching.

Teachers can simplify the problem of learners in flipped classes by using appropriate social media in order to help learners become more proficient in different context. Because class time is just for practicing and problem-solving in flipped classes. However, when EFL learners know why they learn a language, they are more cautious about the ways that facilitate this process. Language teachers can employ social media networks extensively to compensate for the shortage of time and to share a variety of contents including pictures, texts, audio, and videos, using these platforms to provide learners with authentic materials for different language skills. Furthermore, using the flipped classroom in language teaching can benefit language teachers in various ways, as teachers can monitor learners' communication and the way they use target language outside the classroom in those networks to find out difficult and challenging aspects of their language use, and focus language teaching in classroom on these features.

Flipped classrooms increase student engagement. This can be done through providing learners with some opportunities to do lower-order learning activities at their own time, and to perform higher-level tasks through collaboration during class time. That way, instructors can guide the students through exercises and get better insight into who understands the materials and who is struggling. Students have more opportunities to ask questions and get personalized help as they work through the material using higher-order thinking skills. To keep the learners' attention going, educators can add quizzes, puzzles and creating an appealing experience for students. They should devote time to active, collaborative learning activities that help learners evaluate, analyze, and synthesize materials. In flipped classrooms, they can use remote collaborative learning activities to make a little more thought and preparation than in-person ones, but they are equally rewarding. Moreover, they can use classroom debates, and they can appoint learners to represent two sides of a timely or controversial issue, and have them present arguments defending their position. In addition, they can employ breakout discussions, and they can employ the class in smaller breakout rooms, and have students discuss a question, issue, or problem. At the end of the session, they can have each group report on their conclusions. They can also use jigsaw activities by breaking the class up into groups of four or five students. They can have each individual in the group research a different issue or component of the broader subject. During class time, they can have them come together and share their findings. They are recommended to employ seminars in their flipped classrooms,

and they can get students to take turns leading a class discussion on a topic they have researched. In addition, instructors need to develop digital expertise to provide immediate feedback, adequate guidance, and strong support throughout the flipped instruction and to build inter-connectivity between pre-class materials and in-class tasks, based on the flipped approach. Moreover, to reduce learners' workload, sufficient time should be given to learners in the pre-class phase, whereas learning strategies and time-management training should be provided to maximize learners' time use. Teachers can manage the time in classrooms regularly, and learner engagement to arouse motivation. They are required to decrease learners' foreign language anxiety and disengagement, and they need to increase learners' motivation irrespective of educational problems in language learning environments to enrich L2 learning experiences. They should talk to learners about their internal and external motivation in online contexts to be aware of learners' personality traits which help them to engage enthusiastically in flipped learning contexts. They can make their class interactive and motivated by asking challenging questions throughout the class. Through asking and answering questions, learners can be more engaged during the course and learn information efficiently. Collaboration is another way for teachers to increase learner engagement. Learners tend to engage in classrooms when they cooperate on class projects.

Critical thinking can be explicitly taught in the English class, as an accelerator of the thinking ability as well as the speaking ability of the learners. The explicit instruction of critical thinking in English classes, according to the review, can develop higher order thinking in the process of language learning. It is the teachers' responsibility to encourage learners to use their thinking ability and learn to express themselves critically and creatively. He believes that teachers need to be more flexible in their teaching and try to pay more attention to learners' attitudes, interests, and abilities. Moreover, this review recommends language teachers include appropriate tasks, and activities in reading courses to promote critical thinking skills, which then can result in reading comprehension improvement. Teachers' positive attitude toward critical thinking and providing learners with explicit explanations of the importance of critical thinking in education and every aspect of their life are the factors that can enhance learners' critical thinking.

Learners can also improve their critical thinking skills by applying some practical ways. If learners think about the major objectives of the course, their critical thinking skills can develop. The type of activities used in assessing language learners determines the goals of learning. Learners should engage in doing those activities which promote critical thinking skills and require them to think, cooperate, ask questions from themselves and others, etc. learners should ask question in flipped classrooms since asking questions enhances your critical thinking in learning. One question may lead to another, and that will further help in clearing learners' concepts. Moreover, critical thinking skills for learners in flipped classrooms can be developed through social

experiences. If a learner gets opportunities to participate in discussions, both online and offline, S/he must go ahead with it. This will help learners come across different perspectives, and introduce one new information to analyze and develop better communication skills. Learners should also practice active learning through understanding and not just by reciting it innumerable times. It is a method of learning that is based on an experiential approach. Active learning can be achieved through group learning, case studies, demonstrations, visual learning, etc. It is easy to remember information through examples and stories as they reflect the practical implications. Real-life examples, anecdotes, analogies, and facts help develop critical thinking skills.

In order to increase teachers' abilities in doing so, critical thinking issues and training on how to use different methods and techniques of teaching critical thinking should be an essential part of any teachers' training program. On the other hand, training instructors in asking appropriate higher-level questions to promote critical thinking is of great importance. Teachers' effective use of questions and involving EFL learners in class discussions over challenging and appealing topics could engage them in critical thinking processes. Moreover, a teaching and learning environment that considers different and sometimes competing views are crucial in promoting students' critical thinking skills. Tracher educators can hold workshops in pre-service and in-service teacher courses to talk about the importance of learner engagement in language learning. It is also suggested that teacher educators should highlight interaction tools, like mobile applications, which promote engagement based on the subject matter. This review recommends that teacher educators should have a positive view toward teachers and learners, and they should provide well-organized and inspiring teaching methodologies, which can construct a positive context for language learning, and increase learners' engagement in the classroom.

This review can attract curriculum designers' attention to consider critical thinking, as an effective element, in their program. Improving learners thinking ability through appropriate techniques and methods of teaching should be taken into account in designing learning curricula since these skills are teachable and learnable. In an EFL setting, curriculum must be redesigned in which critical thinking skills and techniques be implemented to all courses possible. In other words, the focus should be on critical questioning, critical reading, critical and creative writing and critical listening in all curriculum areas. In addition, the goal of an ideal language curriculum should go toward developing the art of critical thinking.

Educational policy-makers should hire experienced teachers, as the instructive experience can be an important issue for increasing critical thinking and learner engagement among learners. They can ask teachers to do their best within varied educational contexts. They should also provide critical thinking, creativeness, and motivation into the education in classrooms, which enhances language learning. They can hold academic workshops to help teachers increase learner engagement and critical thinking. They can provide internet-based

facilities and positive learning contexts for increasing positive behaviors among learners. The importance of learner engagement can motivate advisors to expand their horizons to identify learners' sources of engagement, and to suggest some strategies to engage more in classrooms.

Given the considerable findings regarding the benefits of FL pedagogy and the growing interest in their factors, it is necessary to investigate how pre-class/in-class and behavioral/cognitive/affective engagement is influenced by learner factors like academic capabilities, learner style, personality traits, epistemological beliefs, positive psychological constructs, and negative emotional states, such as foreign language anxiety, apprehension, boredom, and burnout. More studies are required to investigate whether flipped classrooms can sustain learner engagement after flipped classrooms or not. Theoretical underpinnings like dynamic motivation systems theory (Mercer and Dörnyei, 2020) can be suggested for further research, in order to illuminate the way multiple internal and external factors affect EFL learners' engagement the flipped classrooms. There are some concerns about the asseesment of flipped learning. Some studies have been done the effect of using e-portfolios on the assessment of EFL learners' speaking proficiency (Yastibas and Cepik, 2015; Khodi et al., 2022). Moreover, it is recommended to have students conduct self-evaluations and to apply peer evaluations to foster changes in students' attitudes toward learning in flipped learning contexts (Kim, 2018). Future studies can be done on the reliability and validity of e-portfolios, self-evaluations, and peer evaluations in flipped contexts. Finally, the comparison of different social networks on learners' critical thinking and engagement in a foreign language can be studied in the future.

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The development of EFL Learners' willingness to communicate and self-efficacy: The role of flipped learning approach with the use of social media

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Promoting English as a Foreign Language (EEL) learners' willingness to communicate and self-efficacy in different contexts has drawn the attention of many investigators. This review explored the effect of digital-based flipped learning classrooms on enhancing learners' willingness to communicate and self-efficacy. The related literature indicated that learners' intention to communicate is affected by social media and digitalized materials used in flipped classrooms. Compared to the traditional educational contexts, this review showed higher levels of self-efficacy in flipped classrooms among EFL learners. Furthermore, the review expounded on the implications and future directions for EFL teachers, teacher educators, educational policy-makers, and advisors. The ideas can improve their awareness of learner self-efficacy, willingness to communicate, and the use of flipped learning approach in educational contexts.

KEYWORDS

flipped learning approach, self-efficacy, social media, willingness to communicate, EFL learners

Introduction

One of the developing approaches that has arisen in the field of education with the utilization of technology and has been generally employed in the last decade is the flipped learning approach. The flipped learning approach can be characterized as a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter (O'Flaherty and Phillips, 2015). Moreover, flipped learning approach has four main pillars, which comprise the four letters of the word "FLIP." These pillars are "flexible environment," "learning

culture," "intentional content," and "professional educators," which stand for the four letters of the word "FLIP" (Hu, 2018, p. 5).

Nowadays, as digital communication in flipped learning approach is becoming crucial in everyday life, computer-assisted language learning investigators have sought to understand learners' language use in digital settings in flipped learning classrooms (Lee and Drajati, 2019; Aghaei et al., 2020). Learners' willingness to communicate seems to be affected by the flipped learning approach. The idea of willingness to communicate in second-language acquisition is that those language learners who are eager to communicate in the foreign language actively look for opportunities to impart and communicate. Hence, "the ultimate goal of the learning process should be to engender in language education students the willingness to seek out communication opportunities and the willingness actually to communicate in them" (MacIntyre et al., 1998, p. 547). The existing willingness to communicate in first and foreign language studies appears to have focused mostly on non-digital situations (in-class and out-of-class settings), but relatively little on digital settings (Lee and Hsieh, 2019).

Flipped classrooms have had an important role in developing self-efficacy, helping learners form positive attitudes and emotions, and leading to greater learner satisfaction (Abe et al., 2021). Self-efficacy, which refers to learners' capability to complete a task and the confidence in their skills to perform that task (Pintrich, 1999), is a vital component of learners' aptitude, achievements, and performance (Bandura, 1997), and is significantly correlated with learners' earlier learning experiences (Yeh et al., 2019). Although earlier investigations on educational psychology and second language acquisition have highlighted the significance of self-efficacy in traditional educational contexts, recent studies underscored learners' self-efficacy and its relationship with flipped English classrooms (Namaziandost and Çakmak, 2020).

Bridging the gap between the psychology of language learning and the use of technology, this reviewed the studies on the significance of flipped learning in the development of learners' self-efficacy and willingness to communicate through using social media. The innovation of this review is to illuminate the relationship between technology and positive emotional construct, which may help educators and learners to develop an appropriate method in educational contexts. Moreover, it provides some ideas for educators and teacher trainees to develop learners' self-efficacy and willingness to communicate in foreign language. The findings and implications of the present study will provide relatively novel insights for teachers. Exploration in this field can help educators in many aspects of the classroom to find new approaches to become more effective teachers and accordingly make practical learning setting for increasing learners' proficiency in language use and their self-efficacy. Most of researchers

have recognized the need for alternative teaching approaches to meet different students' requirements in the context of classrooms. This review is significant because it demonstrates the importance of using such a technique, flipped teaching, to improve learners' willingness to communicate and their self-efficacy.

Literature review

Flipped learning approach

For decades, English language investigators have been on the trail of finding an effective and efficient language teaching methodology to foster foreign language skills, consider the changing requirements of learners, and encourage learners to employ more cooperative and individual activities in and outside the classroom (Aghaei and Gouglani, 2016; Chuang et al., 2018). One of the most important instructional approaches to boost language learning is flipped classroom approach. Caner (2012) defined flipped learning as a type of blended learning which is "the blend or mixture of any two instructional technologies" (p. 24). Lage et al. (2000) pointed out that in flipped learning approach, "events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa" (p. 32). Afrilyasanti et al. (2017) defined flipped classroom approach as a type of approach in which learners both take part in-class activities, and they also cope with their online self-learning. They also stated that learners have opportunities to increase their language proficiency at home, and they can involve in activities and collaborate with other learners in the educational contexts. Hung (2018) defined pre-class self-learning as the bringing of linguistic knowledge to learners' private space and time with the help of videos and related exercises. He also described the in-class activities as pair or group activities that are done during class time. Therefore, the shift of material consignment to the outside of the class and using the class time for higher-level activities like applying and examining the earlier learned materials are the primary components of flipped learning approach (Yilmaz and Baydas, 2017). The flipped learning approach is an educational approach that inverts the process of the conventional classroom by presenting the educational substances typically online, involving the students in cooperative group learning, or potentially basic critical thinking exercises completed under the educator's direction amid class (Namaziandost and Çakmak, 2020). This approach can help teachers and learners to prevail over some limits in online education, particularly in terms of time, space, and materials constraints (Haghighi et al., 2019). Kawinkoonlasate (2019) also argued that the flipped learning approach, compared to explicit instructional techniques, can integrate learning activities such as role-plays, discussions, and problem-solving

activities with learning materials outside the classroom. Erbil (2020) also stated that teachers, in flipped classrooms, employ collaborative techniques that directly involve students by integrating instructions, aspects of the learning background, content, and activities.

Constructivism can be called a theoretical foundation of flipped learning approach. According to Aljohani (2017), constructivism is based on the premise that foreign language learning can be developed by providing the means and the time for learners to engage in classrooms. Li et al. (2021) also stated that, in flipped learning approach, learners can construct their foreign language knowledge in the educational contexts, following the comprehension of rudimentary notions through watching the videos, listening to the audio, and reading the materials at home. The cognitive load theory can also specify the importance of flipped learning approach. Using cognitive load theory, Li (2022) stated that flipped learning classrooms prevent working memory overload, since learners work at their own pace in the pre-class preparation stage. Therefore, he asserted that flipped learning approach provides favorable conditions for language learning.

Vygotsky's theory of mediation in digital learning environment can be regarded as a theory which relates technology to psychological states. According to Zidoun et al. (2019), education programs should consider the role and impact of technological developments on learning. The concept of technological mediation, inspired by Vygotsky's (1986) theory of tool mediation, aims to gain insight in the ways in which technology actively co-shapes the relation between people and the world through various mediating effects. De Boer et al. (2018) explain that this understanding of technological mediation emphasizes "the primacy of the relatedness between emotional states of people, technologies, and the world" (p. 300).

The notion of willingness to communicate

There are so many language learners who do not tend to enter L2 communication situations, despite their high proficiency scores on different language learning tests. This issue proves that there is another construct that intercedes between the competence to communicate and to place this competence into practice (Dörnyei, 2005). This construct is called willingness to communicate. The notion of willingness to communicate was presented in the foreign language learning literature by MacIntyre et al. (1998). They defined this notion as "a readiness to enter the discourse at a particular time with a specific person or persons, using an L2" (p. 547). MacIntyre and Charos (1996) also defined willingness to communicate as "a stable predisposition toward communication when free to choose to do so" (p. 7). Kurk (2019) also

mentioned that willingness to communicate refers to a learner's state of cognitive planning to apply the target language in his communication. MacIntyre and Vincze (2017) considered willingness to communicate as the main objective of foreign language learning since the intention to communicate can result in authentic communication behavior, which leads to an increase in foreign language proficiency. Öz et al. (2015) believed that willingness to communicate is indeed a multi-faceted construct that integrates affective, social-psychological, linguistic, and communicative variables and can describe, explain, and predict language learners' communicative behavior in an L2.

According to MacIntyre et al.'s (1998) model, foreign language learners' willingness to communicate has been investigated from trait-like and dynamic, and situated dimensions (Dewaele and Dewaele, 2018). The trait-like or psychological dimension of willingness to communicate is correlated with foreign language anxiety (Liu, 2018), self-confidence, and motivation (Lee and Hsieh, 2019). On the other hand, the dynamic and situated dimensions of willingness to communicate refer to the social and contextual features of education, including interlocutors (Fadilah, 2018), themes of interaction (Mystkowska-Wiertelak and Pawlak, 2016), instructors (Zarei et al., 2019) and cooperative peers (Khajavy et al., 2016). The concept of willingness to communicate has recently drawn the attention of many investigators. Since the establishment of the theory, scholars have begun investigating how willingness to communicate can be directly or indirectly affected by individual factors such as gender (Lee et al., 2021), age (Yetkin and Zekiye, 2022), foreign language anxiety (Kruk, 2022), and language learning motivation (Dewaele and Dewaele, 2018). Concurrently, investigators have begun to realize that willingness to communicate can be focused on dynamic variables such as the role of internet-based resources (Nugroho, 2021).

The role of flipped learning approach in developing learners' willingness to communicate through social media

Flipped learning approach, as a wide-ranging model, enables instructors to foster learners' educational processes (Bergmann, 2018). Das et al. (2022) found that there was an increase in learners' emotional and cognitive engagement during the employment of flipped learning approach. Tsai et al. (2020) stated that brainstorming and activities in flipped classroom approach *via* social networking can expand learners' learning performance and self-learning. Hamid et al. (2015) approved the role of online social networking educational activities in enhancing learners' performance in flipped learning classrooms. They mentioned that learners can leave comments on a blog or discussion forum and ask for more detailed explanations,

add someone as a friend, initiate communication by leaving a message, and collaborate with peers to develop their formal and informal interactions by establishing active communication with their peers. Jafarigohar et al. (2019) investigated the effect of flipped learning approach on learners' cognitive performance. They used the Telegram as the online platform through which the listening materials, such as Ted-talk videos, were sent before the class, and the speaking activities were done through open discussion forums in the Telegram group. They found that flipped learning classroom with the Telegram, as a social media, improves learners' listening and speaking skills. They justified their findings through social constructivism, learner-centered learning, active learning, and learner autonomy theories. All these theories indicate that learning builds up by social context and a facilitator. They mentioned that cooperative learning, as another important aspect of social constructivism, occurs in flipped classrooms and class time, and it includes practice activities where students complete the tasks in pairs or groups to foster their performance in a foreign language. They also argued that the structure of learning materials posted through the Telegram had a positive effect on how the learners perceived the learning environment and participated in the learning process. In ESL context, Kasuma (2021) found that incorporating Facebook, as a social media, facilitated the use of preferred learning styles and strategies, which enhanced learners' learning interest, improved their language abilities, and provided them with the best academic experience. Nugroho and Atmojo (2020) explored EFL learners' insights and instructional activities of digital learning of English in a flipped classroom. Using a web-based survey and semi-structured interview, they found that learners have a positive attitude toward the use of digital technology to learn English outside the classroom. They mentioned that using social media such as Facebook, Instagram, and YouTube can facilitate the EFL learners' performance and achievement.

Some studies have shown that learners' willingness to communicate is significantly affected by the social networks in the flipped learning approach. Lee and Hsieh (2019) investigated Korean and Taiwanese learners' willingness to communicate in flipped learning classrooms. Their study showed that instructional practice affects a higher willingness to communicate in a foreign language in digital settings. They also mentioned that instructors' rapport, like encouraging learners to socialize with other English users on social media, promotes learners' willingness to communicate in flipped classrooms. Mohammadi et al. (2019), in their experimental study, employed collaborative tasks and textbook, and in-class quizzes in both traditional and flipped educational contexts. They found that learners utilizing social networks like Telegram have significantly higher levels of willingness to communicate in a foreign language. Their study showed that theory-based flipped instruction using wide-ranging online interaction through the social network like Telegram encouraged learners to involve in

more learning tasks by being active and competent in using the learned grammar, vocabulary, and reading materials for communicative interaction, storytelling, dialog development, class discussion, and group presentations, which in turn lead to the higher levels of willingness to communicate. Khosravani et al. (2020) used videos, audio, and reading online materials through the social network to determine their effects on learners' autonomy, motivation, and willingness to communicate. They considered the construct of willingness to communicate as a stable construct that is stable across time and situations. However, their study revealed that flipped learning approach did not have significant effects on learners' willingness to communicate. On the contrary, Lee and Lu (2021), in their study, used extramural English activities on the Internet (e.g., watching YouTube clips in English and chatting with others in English *via* social media). Their study indicated that the extramural digital setting significantly affected learners' willingness to communicate in a foreign language as a dynamic concept. They also found that EFL learners with a clear L2 self-image are highly motivated to learn and practice English, which can prompt their willingness to communicate in English in the classroom. Nugroho (2021) studied the effect of using informal digital English learning in flipped classrooms on Indonesian EFL learners' willingness to communicate. His study showed that frequency of informal digital English learning, like social media, and the performing of receptive and productive tasks *via* social networks boost EFL learners' willingness to communicate. They argued that EFL learners' engagement in digital learning activities such as watching English videos, reading news online, and posting English content, increases their motivation to communicate in a foreign language. Using a mixed method design, Zarrinabadi et al. (2021) investigated the influence of flipped learning approach on EFL learners' willingness to communicate. They used the Telegram application to assign learners pre-class activities. Learners were supposed to watch the videos, study short texts, and listen to audio recordings related to the content of each lesson. Their study showed that flipped classroom strategy significantly influenced learners' willingness to communicate by making language learning enjoyable, increasing motivation, and decreasing language anxiety. They argued that practicing the materials through the social network in flipped educational contexts can promote learners' self-confidence and reduce their stress and anxiety, leading to an increased willingness to communicate.

Earlier studies have indicated that foreign language anxiety, as a negative emotional state, is an influential variable that affects willingness to communicate. (e.g., Dewaele, 2019; Kruk, 2019; Lee and Drajati, 2019). Moreover, social media can significantly affect learners' foreign language anxiety (Su and Fatmawati, 2019). Desta et al. (2021) noted that social media helps learners to diminish their level of anxiety in language use. They mentioned that social media, used as a

learning tool, improves learners' English language competency by reducing their level of anxiety. Su and Fatmawati (2019) found that the offered project through Facebook can improve learners' cognitive and psychological matters when dealing with speaking skill. They believed that social media, like Facebook, can relieve the students' feeling of anxiety which eventually improve their language use. Sharma (2019) also asserted that social media is regarded as a remedy to lower affective variables, increase confidence, improve communication in L2, increase motivation, reduce anxiety, decrease shyness, and to enhance positive attitudes toward language learning. Sun et al. (2017) indicated that EFL learners are likely to experience shyness or even fear when communicating in English. They mentioned that communicating *via* social-networking sites reduces learners' anxiety about using their target languages, and helps them connect with other learners of the same target language.

Perceived communicative competence is another predictor of foreign language learners' willingness to communicate (Elahi Shirvan et al., 2019). Studies have shown that using social media affects learners' perceived communicative competence (e.g., Boatis et al., 2020; Yekimov et al., 2021; Nelyska, 2022). Morreale et al. (2015) mentioned that the ability of learners to communicate competently is impacted by how they use the newer communication technologies now ubiquitous in their daily lives. They mentioned that learners are willing to forgo the abundant benefits of face-to-face communication, most likely in favor of speed and convenience. They argued that social media brings attentiveness, expressiveness, appropriateness, effectiveness, knowledge, efficiency, and motivation. Moreover, it fosters communicative competence. They also asserted that learners, in their study, perceive themselves to be more competent when they are using social media. Puzanov et al. (2022) mentioned that well-known blogs, podcasting, media objects, wikis, and social bookmarks are the most popular social services that can be used effectively to develop learners' communicative competence. They mentioned that interactivity in social media, such as Facebook, Instagram, and TikTok are helpful to foster learners' communicative competence and their intention to communicate in a foreign language.

Studies about willingness to communicate in a foreign language have shown that motivation is a significant predictor of this construct. (Khajavy et al., 2019; Alrabai, 2022; Kruk, 2022). Mulyono and Saskia (2020), in their study, investigated the role of self-confidence, motivation, and anxiety in promoting students' willingness to communicate in traditional and digital settings. They found motivation as an affective variable that influences learners' willingness to communicate in both digital and traditional environments. The role of social media in promoting learners' motivation has been verified in earlier studies. Xodabande (2017) also argued that the proper use of social media can enhance learners' interests and motivation, facilitate students' access to target language input, provide them

with more interaction opportunities and feedback and also give the instructors the tools they need to organize course content. Dirjal et al. (2020) investigated the possible role of social media, particularly Skype, in promoting and developing learners' motivation for language use. They found that male and female learners were highly motivated after receiving their instruction *via* Skype device. They argued that social media can foster both internal and external motivation among learners, which provides the primary impetus to initiate L2 learning and later the driving force to sustain the long, often tedious learning.

The notion of self-efficacy

Emotions, as the primary issues in learners' foreign language learning (Piniel and Albert, 2018), are investigated in various settings. Self-efficacy, as a positive emotional construct, is defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Bandura (1986) asserted that self-efficacious individuals rely on their competence to deal with demanding activities, and carry out the required strategies to be effective in forthcoming situations. Jeong et al. (2021) stated that self-efficacy specifies students' confidence in arranging their learning process and influences their apprehension of cognitive growth. Schunk and Pajares (2010) also indicated that individuals with higher levels of self-efficacy are inclined to have higher intrinsic interest, set themselves thought-provoking objectives, and keep a strong commitment to activities. Bandura (1997) listed four primary sources of self-efficacy beliefs as (1) enactive mastery experiences, (2) vicarious experiences, (3) verbal persuasion, and (4) the physiological and affective state of an individual. Zhang and Ardasheva (2019) stated that enactive mastery experiences, are the most significant cause of self-efficacy. They mentioned that enactive mastery experiences are related to an individual's insight over his/her own capability to positively undertake a specific task informed by earlier accomplishments. They mentioned that enactive mastery experiences are related not only to individuals' perception of their capability, but also the task's difficulty, and the amount of effort they will exert to accomplish the task. According to Wilde and Hsu (2019), vicarious experiences, as the second source of self-efficacy, are concerned with social comparison of a person's performance to that of others with similar abilities. El-Abd and Chaaban (2021) asserted that observing others' comparable capabilities can improve one's self-efficacy by approving the sufficiency of his/her knowledge, abilities, and approaches. Verbal persuasion, the third source of self-efficacy, refers to "socially persuasive feedback, comments by significant others regarding one's performance" (Bandura, 1997, p. 20). Wangwongwiroj and Yasri (2021) mentioned that constructive comments emphasizing an individual's aptitudes

or achievements will improve self-efficacy. The physiological and affective state of an individual, the fourth source of self-efficacy, is related to individuals' capability to control bodily and emotional stress reactions (e.g., breathing, anxiety) over task performance (Webb-Williams, 2018).

The role of flipped learning approach in developing learners' self-efficacy

Integrating positive individual learning experiences can lead to increased accomplishment in the educational context (Wagner et al., 2020). Some investigations about the effect of flipped learning approach on learner self-efficacy have drawn the attention of many scholars (e.g., Iyitoğlu and Erişen, 2017; Doo and Bonk, 2020; Namaziandost et al., 2020). The investigations on self-efficacy and flipped classes underscored positive emotional states, since self-efficacy stems from meeting basic cognitive needs such as a sense of competence, autonomy, and social interaction (Ha et al., 2019). In studying the relationship between web-based flipped learning and self-efficacy, Su Ping et al. (2020) examined the variables in which learners demonstrated improvement after flipped classroom learning. To create more opportunities for interactive class activities and discussions in flipped learning approach, they converted two-thirds of the course content into 115 min of web-based conferences. They recorded their interaction using the accessible version of Camtasia. Using semi-structured interviews, they found that learners' practice, commitment, communicative competence, motivation, and self-efficacy improved in the flipped educational context.

Fallah et al. (2020) examined the impact of the flipped learning approach in raising learners' motivation and self-efficacy. They compared flipped classrooms with traditional ones. The provided out-of-class materials for learners were teacher instructional videos, pamphlets, Internet blogs, and social media, including Telegram and WhatsApp. They found out that flipped classroom technique was effective in fostering learners' motivation and self-efficacy among learners. They asserted that students use active learning strategies such as discussion about current topics, case studies, case analysis, concept map development, problem-solving, short lectures, and small group discussions on the social media. They also added that flipped learning approach allows instructors to involve in a higher level of Bloom's cognitive classification, including application, analysis, and combination. Moreover, they stated that learners, in using social media and educational software, have access to new mental concepts and achieve more and better skills. Finally, they argued that using social media in flipped classrooms involves learners' different senses and makes the lesson diverse and attractive for them; hence, it seems to improve learners' self-efficacy. Using the achievement emotion model, Zhao et al. (2021) found out that learners'

learning satisfaction, self-efficacy, and learning motivation were higher in flipped educational contexts than in traditional ones. They argued that when learners know that the instructor would observe their learning status through feedback and interaction with each other on social media, they feel pressure from their peers which ultimately fosters their learning and self-efficacy. They also stated that the use of social media in flipped classrooms will keep learners aware of their capabilities. Therefore, they can advance their ability and learn about their own self-reliance, which increases their self-efficacy.

Moreover, Latorre-Cosculluela et al.'s (2021) study revealed that learners' self-efficacy is affected by the learning experience and the innovative educational approach like flipped learning. They justified their results according to Bandura's social learning theory. They argued that the elements of the environment could determine learning behaviors and also influence learners' self-efficacy beliefs. They also mentioned that a fully online learning formats like video classes, can expedite learners' cognitive involvement, and provide guidance to interact with the learning content competently. Consequently, the chances that learners' self-efficacy will be improved are more significant in those online flipped learning course formats. In these online learning environments, students must access the courses completely independently and plan their learning times, pace and strategies by themselves. Their study implicated that the utilizing online formats in flipped learning is a beneficial resource for developing active learning contexts in which learners can cultivate their self-efficacy.

By the same token, Luo and Gan (2022) validated flipped learning readiness factors by considering the factors, such as doing previews, in-class communication self-efficacy, positive experience, intentional behaviors, and self-directed learning. Using exploratory and confirmatory factor analysis, they found that self-efficacy is the strongest predictor of Chinese learners' flipped learning readiness. They argued that the lack of proficiency in using social media software in flipped learning results in unproductive education, unconvincing self-efficacy, and deficient learner involvement. Their study implicated that instructors should encourage learners to reinforce their confidence and sense of achievement in language learning. In doing so, learners' self-efficacy can be fostered, which may increase their readiness for flipped learning.

Self-efficacy, as a component of a self-regulated learning strategy, positively contributes to EFL learning (Roohani and Asiabani, 2015). According to Lai and Hwang (2016), self-regulated strategies can help learners to manage their learning, planning, monitoring, and evaluating their own learning process. They mentioned that incorporating self-regulated strategies into flipped learning through social media can foster language performance by enhancing learners' self-efficacy. Hosseini et al. (2020) argued that integrating the self-regulated strategies under a flipped-learning context not only enables learners to use the strategy of planning, be aware of

their learning process, be able to evaluate their learning, and make effective use of their study time, but also gives learners the higher level of confidence enhancing their self-efficacy. Öztürk and Çakıroğlu (2021) also explored the enhancement of learners' language skills in a flipped classrooms designed with self-regulated learning strategies. They provided web platforms to the learners in the control group to study online to construct knowledge for the in-class sessions. However, learners in the experimental group used self-regulated learning strategies in web-based flipped classrooms by participating in forums, diary, and test modules. In these web-based modules, they employed self-regulated strategies, including time management, help-seeking, self-efficacy, organizing, rehearsing, and giving feedback. The modules comprised data about occurrences of watching videos and the number of forum messages, duration of the actions, and online test scores. Their study showed that learners' foreign language skills are significantly affected by self-regulated learning strategies in the flipped classroom model.

Studies have shown that vicarious experience is a causal element of self-efficacy (e.g., Phan and Locke, 2015; Alrabai, 2018; Zhang and Ardasheva, 2019). Inayati and Emaliana (2017). mentioned that the incorporation of social media and technology in the educational context enriches personal as well as vicarious experiences of learners and teachers that can shape their beliefs about educational settings. Boahene et al. (2019) mentioned that sharing on social websites can expose students to new abilities resulting in more effective learning and enhancing students' efficacy beliefs which are similar to vicarious experience. For example, research by McCoy (2010) to examine the relationship between self-efficacy and technological proficiency of students established that the use of computer at home may improve computer abilities in addition to self-efficacy. Also, mastery experience, as the primary source of self-efficacy, has been affected by social media. Siregar et al. (2020) indicated that social media as a vital learning tool in the 21st century enhances pedagogical competence, and it is effective for promoting mastery experience, translating into higher self-efficacy beliefs which are critical in enhanced performance in classroom management, instructional strategies, and student engagement activities. Bailey and Rakushin-Lee (2021) also underscored the role of social media, particularly Facebook, in enhancing learners' master experience in educational contexts.

In addition to the effect of social media on learners' self-efficacy, studies have highlighted the role of social media in developing other positive psychological constructs, such as well-being (Kross et al., 2021), academic engagement (Mahdiuon et al., 2020), enjoyment (Graciyal and Viswam, 2021), grit (Chua et al., 2020), resilience (Mano, 2020), and pedagogical love (Kasperski and Blau, 2020). Promoting positive traits can have substantial impacts on learning development, and many positive traits can be cultivated partially by emotional events and social influence. Today, practitioners and researchers of positive psychology may have

the opportunity to design proper social media for positive development by means of observing the relationship between individual behavior and social influence. The popularity of social media can have the potential to create supportive social contexts by helping their positive development (Chua et al., 2020). The activities involved in social media, including their individual engagement and social influence, can have considerable impacts on the future development of their behavior.

Suggestions for further research

Earlier studies have indicated that social network, such as Telegram, Facebook, Youtube, and Instagram used in flipped classrooms can develop learners' performance and active learning by paving the way for brainstorming activities (e.g., Nugroho and Atmojo, 2020; Tsai et al., 2020). Studies have shown that social media, with interesting platforms, inspire learners to interact with peers and teachers, which in turn, enhances learners' intention to communicate in foreign language (e.g., Khajavy et al., 2016; Mohammadi et al., 2019; Puzanov et al., 2022). Some investigations also underscored the role of Telegram in inspiring learners to engage in learning tasks, and to promote their communicative competence (Jafarigohar et al., 2019; Mohammadi et al., 2019). Studies have also shown that social media significantly affect learners' motivation and perceived communicative competence, which influence willingness to communicate in foreign language (Nugroho, 2021; Sharma, 2019; Mulyono and Saskia, 2020; Xodabande, 2017). Moreover, investigations pinpointed the role of anxiety in willingness to communicate. In this regard, studies have shown that social media can reduce foreign language anxiety levels through fostering positive attitudes toward language learning (Sun et al., 2017; Su and Fatmawati, 2019; Mulyono and Saskia, 2020; Desta et al., 2021). The related studies have shown the positive effect of social media on learners' self-efficacy (Zhang and Ardasheva, 2019; Fallah et al., 2020; Latorre-Cosculluela et al., 2021; Zhao et al., 2021; Luo and Gan, 2022). Investigations have indicated that learners can develop their vicarious experience and mastery experience by using social media (Alrabai, 2018; Phan and Locke, 2015; Siregar et al., 2020; Bailey and Rakushin-Lee, 2021). The capacity for teacher and peer observation in social media can increase learners' social media. Consequently, the provision of positive psychological states through social media can increase learners' self-reliance, which enhances their self-efficacy. Social media is useful for increasing learner engagement, which improves self-efficacy (Zhao et al., 2021).

This review probed the role of flipped learning approach in learners' intention to communicate and self-efficacy. Studies showed that flipped classrooms, in which social

media are used, increase learners' willingness to communicate and self-efficacy. This review includes some pedagogical implications for teachers, syllabus designers, teacher educators, educational policy-makers, and advisors. In light of the related literature, teachers should be aware of using flipped teaching in their classes to increase learners' willingness to communicate and self-efficacy. This review implicated that flipped teaching methods improve language achievement scores, and can be a means of helping students with different needs and abilities. It is significant for teachers to constantly explore new teaching methods to meet the students' needs. Teachers can simplify the problem of learners in flipped classes by using appropriate social media to help learners become more proficient in a different context, since class time is just for practicing and problem-solving in flipped classes. However, when learners know why they learn a language, they are more cautious about the ways that facilitate this process. Teachers should provide rich opportunities for learners to in active learning while coping with their learning problems according to flipped instructions. Flipped learning also allows teachers to spend more time individually interacting with students, which creates more opportunities to check for understanding and clear up misconceptions.

A better understanding of students' willingness to communicate in the target language may help language teachers improve the communicative language teaching approach and curriculum design to provide more communication opportunities for language learners, more importantly, encourage actual engagement in communication behaviors, and finally, facilitate second/foreign language learning and acquisition. More specifically, language instructors can enhance the level of students' willingness to communicate through the following ways: raising students' opportunity to talk by reducing the amount of teacher talk and allowing adequate wait-time; letting students produce language without restrictions, uncontrolled use of language; take responsibility to engage all students evenly and equally in classroom activities; videotaping themselves in the classroom, reflect on their interactional behavior to see if it has extended or limited the opportunity for the students to enter dialogs; increasing their own awareness of what interaction strategies work or do not work with specific students, and giving the instruction that lends itself to more giving and receiving of unpredictable information. Teachers can increase the amount of willingness to communicate and motivation in English classrooms by saying "Thank you" to EFL students for working hard at the end of the lesson to give positive strokes verbally or non-verbally, and encourage them. Also, the EFL students can receive different strokes by doing well or never doing well. Therefore, strokes might distinguish between successful and unsuccessful learners.

The instructors could request some foreigners, including both native and non-native speakers, to come to their classrooms to expose their students to wide variety of English

dialects and accents. They might consider forming a discussion forum for all levels of students in which the students can communicate freely with foreigners without concerning about their grades. Another way for instructors to make environments for their students to interact in English would be to contact their colleagues in other countries and allow their students to interact in English *via* the Internet. A computer lab that is connected to the Internet would permit these students to have a synchronous conversations with peers in other countries. Since computer-mediated communication is believed to boost speaking, expand student motivation, and self-esteem (Compton et al., 2004), having online chats would not just enable students to communicate in English but also motivate them to learn English and enhance their self-confidence. By making environments for communication with foreigners, instructors give their students chances to share cultural knowledge with foreigners and to form realistic attitudes toward different cultures. For online and face-to-face communications, instructors may want to prepare a situation that would permit their students to share their own culture, learn about the culture of their counterparts, and gain the realization of various cultures.

Teachers have to take care of and help the learners who suffer from poor self-efficacy and help them improve in terms of self-regulation, self-esteem, and self-concept as these traits form the bases of self-efficacy (Ghonsooly and Elahi, 2010). It is believed that instructing learners on techniques to improve their self-efficacy should be given the same priority as other language skills in the EFL context. Self-efficacy could have an important role in the application and use of the approaches and methodologies in the EFL context. Instructors can use moderately-difficult activities to empower learners with low levels of self-efficacy. The activities should not be too difficult to curb learners' self-confidence in doing tasks. Teacher support, including scaffolding, assigning sufficient time, decomposing difficult tasks into simple phases, and explicating the task in technology-supported education, are influential for enhancing leaners' self-efficacy. This can produce an insight into reasonable challenge and equalizes the complexity of technology-supported tasks. Praising and giving feedback to learners are also crucial for improving learner self-efficacy. Moreover, teachers should not compare the performances of learners with each other. Teachers can provide learners with some strategies such as self-verbalization. For example, they can motivate learners to express the procedure of learning grammatical points or vocabulary aloud, and give feedback on their effort. Moreover, teachers can set a cooperative context, rather than a competitive one, to increase learner interaction and scaffolding, improving learner self-efficacy. They can also ask learners to write comments about their feelings and progressions in technology-supported contexts.

Moreover, teacher trainers can reach their ideal goals by considering the importance of self-efficacy, willingness to communicate, and flipped learning approach. To increase learner self-efficacy, they can implement some instructional

changes in a large population of teachers by holding academic workshops. They can provide teachers with some strategies and techniques to increase learners' willingness to communicate. In workshops, teacher trainers should suggest the consideration of learners' experience in choosing the topic for learners. They can use survey and brainstorming techniques to collect information about topics. Moreover, the manner of error correction and the grouping of learners should be provided to instructors to boost learners' willingness to communicate. Teachers can group learners based on learners' topics of interest or their level of language ability.

Educational policy-makers should hire experienced teachers, as the instructive experience can be an important issue for increasing self-efficacy and willingness to communicate among learners. They can ask teachers to do their best within varied educational contexts. They must build up teaching effectiveness by providing contexts for observations of other teachers' activities and mastery experiences to increase learners' engagement in language production in particular ranges of instruction. They should also provide critical thinking, creativeness, and motivation to the education in classrooms which encourage self-efficacy. The importance of self-efficacy, and willingness to communicate can motivate advisors to expand their horizons to identify learners' sources of self-efficacy, and to probe the reasons for increasing oral communication skill.

Other emotional constructs, including grit, foreign language enjoyment, learner engagement, pedagogical love, and resilience, can be investigated in digital-based flipped learning classrooms. It would also prove productive to inspect teachers' perceptions of the communication behaviors of their learners in flipped and traditional classrooms. Moreover, the effect of different social networks on learners' self-efficacy and willingness to communicate in a foreign language can be studied in the future. Moreover, the relationship between different language skills and other positive psychological constructs, such as academic engagement, well-being, enjoyment, and resilience in flipped classrooms can be investigated in the future. Future research can be conducted about the relationship between teaching style, and learners' willingness to communicate in flipped classrooms is a big issue to explore. Moreover, the negative emotional states, such as foreign language anxiety, apprehension, boredom, and burnout, can be studied in traditional, blended, and flipped classrooms.

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The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Impact of social media-supported flipped classroom on English as a foreign language learners' writing performance and anxiety

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As flipped classroom has received much attention from researchers and educators, some scholars have investigated the effectiveness of this teaching mode in various English as a foreign language (EFL) settings; however, such an instruction mode has been under-investigated in the Chinese EFL context. Therefore, the current study examined a flipped course's impact on Chinese EFL learners' writing performance and anxiety utilizing a pretest-posttest non-equivalent group quasi-experimental design. First, it selected a sample of 50 Chinese EFL learners from two intact language school classes as the participants *via* the convenience sampling method. Then, it randomly assigned participants of these two intact classes to a control group (*n*=24), taught based on the traditional method of writing instruction, and an experimental group (*n*=26), instructed based on social media-supported flipped instruction. The study used two writing tasks and a writing anxiety inventory to gather the data from the participants. The descriptive and inferential statistics results showed that the experimental group—taught based on flipped writing instruction—significantly enhanced their writing performance. Moreover, they revealed that the flipped course substantially reduced participants' writing anxiety. Implications of such findings have been elaborated for EFL research and practice.

KEYWORDS

flipped classroom, writing performance, anxiety, EFL, quasi-experimental research

Introduction

Although literacy development is a universal goal for all students, this aim seems to be more formidable and challenging for EFL learners, especially as far as writing skill is concerned (Yu and Lee, 2014; Wu X. et al., 2020). As the world has become text-centric, it is of much importance to improve the writing competencies of learners, a situation which makes instructors in great need of more effective techniques for writing development (Klimova, 2014; Rahimi and Fathi, 2021; Yu et al., 2021). Writing is considered as a unique

skill since it requires adequate practice and knowledge of three other language skills, namely listening, reading, and speaking (Hao, 2016; Chuang et al., 2018). Additionally, writing skill needs the mastery of other competencies, including metacognitive ones (Klimova, 2014). While engaged in writing activities, learners need to establish a clear objective, plan carefully, reflect on how to organize as well as structure their writing, and revise it effectively. As reported by Walsh (2010), it is essential to learn how to write in a second language (L2) because this skill is used extensively in higher education and in workplaces. As such, in order to communicate effectively with instructors, employers, peers, or others, students need to know how to express themselves in written mode (Ferris, 1999).

For a long time, L2 researchers have sought to develop effective methodologies for teaching L2 skills. The novel and effective methods should keep up with the changing needs of students and motivate students to engage in more collaborative and individual activities inside and outside the classroom (Klimova, 2014; Hao, 2016; Wu et al., 2017; Fathi and Rahimi, 2020). A flipped classroom is an innovative teaching procedure that has caught the attention of researchers and educators particularly in the EFL contexts (Tseng et al., 2018; Jiang et al., 2022). Unlike traditional classes, where lectures precede class activities, flipped classroom is a method in which students are engaged in doing assignments inside the class and study the content themselves before coming to the class (Bergmann and Sams, 2012; Chuang et al., 2018; Wang et al., 2018; Sit and Guo, 2019; Zou and Xie, 2019; Fathi and Rahimi, 2020; Yang and Chen, 2020). As an innovative teaching method, flipped instruction reverses the order of completing assignments and classroom activities. In a traditional classroom, students gain knowledge and information mainly through teachers' lectures and then carry out assignments at home and outside the class (Herrald and Schiller, 2013). However, students in a flipped classroom can cover pre-class teaching content at their own pace without feeling stressed or frustrated so that they can be fully prepared for in-class activities before coming to the class (Strayer, 2012; Leis et al., 2015; Chen Hsieh et al., 2017; Ho, 2020). As such, a greater portion of class time would be dedicated to students' activities, which would enable students to synthesize their home-grown learning, ask more questions, collaborate on the required activities, and receive further insightful feedback (Gannod et al., 2007; Davies et al., 2013; Buitrago and Díaz, 2018; Wang et al., 2018). Despite the effectiveness of traditional lectures' in transmitting information, they might be less effective when it comes to teaching skills, values, and personal development, which require more active participation on the part of the students (Johnson, 2006).

As a novel methodology, flipped instruction has become increasingly popular in L2 education mainly due to recent technological developments and novel educational orientations (Kim et al., 2014; Chuang et al., 2018). Numerous researchers have averred that flipped instruction can increase motivation, facilitate autonomous learning, and foster better learning through better management of cognitive load (Ferreri and O'Connor, 2013;

Engin, 2014; Chen Hsieh et al., 2017; Tseng et al., 2018; Jiang et al., 2022). Based on this method, instructional materials are given to students prior to their class attendance, leading to their having further time to learn outside the class (Chen Hsieh et al., 2017). Consequently, learners in class are more actively engaged in the learning process as they do assignments in lieu of formal class time and learn collaboratively (Mok, 2014; Chuang et al., 2018; Fathi and Rahimi, 2020). The L2 writing process is usually accompanied by numerous challenges, including cognitive and linguistic engagement as well as lack of adequate proficiency in lexical knowledge, grammar, cohesion, and coherence (Ferreri and O'Connor, 2013; Xu and Qi, 2017). It is argued that flipping writing classrooms can alleviate such challenges and difficulties by devoting further time to doing tasks inside the classroom (Leis et al., 2015; Arifani et al., 2020; Fathi and Rahimi, 2020; Liu et al., 2022). Additionally, flipping writing instruction has been effective in improving both the global and local writing abilities of EFL learners (Wu et al., 2019; Liu et al., 2022). Also, if learners are trained to address the writing issues related to their writing content, organization, and vocabulary use during their collaborative writing activities inside the class, they will be able to provide and address peer writing mediations, which will eventually result in improving writing skills (Liu et al., 2022).

As highlighted by Aydın (2008), anxiety is an affective variable that has a significant impact on learning a foreign language (FL). For many years, L2 researchers have focused on anxiety's role in L2 learning (Horwitz et al., 1986; Sahoo and Sinha, 2020; Gok et al., 2021). When students are highly anxious about writing, they are less efficacious and use self-regulation strategies less often than students with lower anxiety levels (Stewart et al., 2015; Paul et al., 2021). Moreover, it is argued that anxiety can pose many difficulties for foreign language students because it can hinder the acquisition, maintenance, and production of the new language (MacIntyre and Gardner, 1991). Additionally, students' motivation, attitudes, and anxiety are all factors influencing their success in FL classes (Aydın, 2008; Tallon, 2009).

Despite the existence of some studies regarding the effects of flipped instruction on anxiety in other language skills (Gok et al., 2021; Rajabi et al., 2021), there is little research on foreign language writing anxiety. Moreover, although flipped instruction is widely researched in EFL contexts (Jiang et al., 2022), its real implementation in writing classrooms might require further exploration especially in Chinese EFL context. Therefore, the major aim of this study was to investigate the impact of flipped classroom on L2 language writing performance and writing anxiety of Chinese EFL learners using a quasi-experimental design. In this study, the flipped instruction is supported by the use of social media (e.g., YouTube, Facebook, and Instagram), which have been claimed to be useful in enhancing L2 learning (Barrot, 2021). Social media can transcend the conventional instructional constraints by meeting various needs of L2 learners (Barrot, 2018, 2020). They are also argued to be effective in developing communicative competence, cultural awareness, and other skills and components (e.g., Vásquez, 2014; Reinhardt,

2019). However, some researchers have doubted the use of social media for educational purposes as far as L2 learning is concerned (Wang and Vásquez, 2014; Aloraini, 2018; Hsu and Beasley, 2019). Therefore, two research questions are formulated to address the research objectives of this study:

> Research Question 1: Compared to a conventional classroom, how effective is social media-supported flipped classroom of TOEFL training in developing Chinese adult EFL learners' writing performance?

> Research Question 2: Compared to a conventional classroom, how effective is social media-supported flipped classroom of TOEFL training in reducing Chinese adult EFL learners' writing anxiety?

Literature review

Self-determination theory

Self-determination Theory (SDT) is basically a humanistic theory which posits the inherent individuals' inclination in getting involved in their context, overcoming setbacks, and accomplishing objectives (Deci and Ryan, 1985). According to this theory, motivation types fall within a continuum based on their self-determined or relative causality locus (Deci et al., 1991). Self-determined actions have internal locus of causality while actions which are not self-determined are perceived to have external locus of control. From this perspective, motivated behavior can be self-determined if it addresses basic, inherent psychological needs of human beings including *competence*, *autonomy*, and *relatedness*.

Intrinsic motivation is the most self-determined motivation type in that if individuals are intrinsically motivated, they are devoted to doing that action because of inherent enjoyment of that activity. On the other hand, if people are extrinsically motivated, they do an activity because of its contingencies rather than the activity itself. In SDT, amotivation is also viewed as a situation in which learners have no particular intention in doing something, indicating the presence of neither intrinsic nor extrinsic motivation types. One primary concern within SDT is to explore how contextual variables can affect intrinsically motivated behaviors (Ryan and Deci, 2000).

Flipped classroom

Flipped classroom is relatively a new concept, but it has certainly gained a lot of attention in recent years due to the incredible advances in technology devices and global access to computers and smartphones (Bergmann and Sams, 2012; Liu et al., 2022; Mirzaei et al., 2022). The traditional classroom activities, which were conducted by the teacher and homework assignments that were completed in the teacher-oriented classroom, are now carried out at home in a student-centered learning context (Davies et al., 2013; Mehring, 2016). Flipped teaching has attracted many L2 instructors recently and the idea of flipped classroom came up by many instructors dissatisfied with the boredom of classical teacher-centered classrooms as well as learner passivity in technologically laden 'smart' classrooms (Mehring, 2016; Tseng et al., 2018; Ho, 2020; Luo et al., 2020; Mirzaei et al., 2022). In addition to flipped classroom model (Bergmann and Sams, 2012), SDT (Deci and Ryan, 1985) can act as the theoretical underpinning of this study. According to SDT, individuals' motivation can be explored in various educational settings in which they can meet three intrinsic psychological needs including autonomy, relatedness, and competence (Ryan and Deci, 2000). Fulfilling these needs can affect learners' degree of motivation, engagement, and cognitive functioning. Conversely, neglecting these needs can negatively influence learners' well-being, motivation, and learning process (Cheon and Reeve, 2015). From this perspective, flipped classroom provides the learners with a sense of autonomy, which in turn can affect their motivation, engagement, and learning outcomes.

Concerning the empirical background, several more illustrating studies investigating practices for flipping the L2 classroom are reviewed here. For example, Lee and Wallace (2018) explored the utility of the flipped instruction at a South Korean university. The participants of this study were 79 students. A number of 39 students were assigned to the group which received communicative language teaching approach, while the other 40 students were assigned to the flipped instruction group. The data were collected through the use of surveys, tasks, and teacher's notes. The results showed that the students who received flipped instruction performed much better on the final examination than the non-flipped group. Moreover, the results indicated that participants enjoyed flipped instruction better and were more involved in the learning process. In another study, Adnan (2017) investigated the impact of flipped classroom and non-flipped classroom on EFL students' perceptions. The data were collected according to students' grades, journals, and interviews. The results of this study indicated that students' perceptions of flipped classroom were generally positive, and they performed better on writing than the non-flipped instruction group. Similarly, Chen Hsieh et al. (2017) carried out a mixed methods study to explore the benefits of flipped classroom. The participants of this study were English major students. These participants were supposed to learn idioms traditionally and also with the help of LINE application. Data collection was done by the use of pre-and post-tests, questionnaires, the teachers' observations, and semi-structured interviews. The findings indicated that by implementing flipped instruction, students' motivation and involvement in learning increased and their knowledge of idioms improved.

In another study, Bishop and Verleger (2013) reported different but still positive attitudes toward flipped classroom by their participants. Similarly, Davies et al. (2013) explored the effect of flipped classroom on students' achievements and the findings of this study revealed that although students were satisfied with

the flipped classroom, their grades remained stable. It is generally accepted that flipped classroom has positive effects on L2 development in many aspects, as evidenced by some L2 studies reviewed above (e.g., Adnan, 2017; Chen Hsieh et al., 2017; Lee and Wallace, 2018).

Some researchers, however, maintain that some factors may contribute to success or failure of flipped instruction in engaging learners (Hao, 2016; Yilmaz, 2017; Liu et al., 2022). Students' technological literacy is an important factor in engaging them in online classrooms. For example, Yilmaz (2017) investigated the impact of technology literacy of undergraduate students on their motivation in flipped classroom. The data were collected through some technology readiness scales, satisfaction scales, and questionnaires. The results showed that learners' technology literacy was a crucial predictor of their motivation in flipped classroom. Therefore, the learners must be prepared to conduct classes in an online environment, work with different apps, and communicate in a new environment. Additionally, Hao (2016) claimed that learning in the flipped class requires responsibility and commitment as well as some basic technical skills for students to be able to manage a class effectively. As a result, one of the variables affecting the success of flipped instruction is the ability to manage one's own learning in technology-enhanced learning environments.

Flipped classroom for writing skill

Writing is an important skill for L2 language acquisition and is considered an essential communication tool in the modern world. In a typical writing classroom, EFL students often struggle to write due to confusion about grammar, limited vocabulary, and a lack of knowledge about how various genres of writing work (Chen, 2002). For students with low proficiency, writing skill is particularly difficult as they are restricted in terms of resources, processes, and controls (Chenoweth and Hayes, 2003). As a result, these students lack the resources and have trouble controlling their writing for genre suitability, accuracy, and fluency (Su Ping et al., 2020). Consequently, teaching low proficiency students how to compose appropriate texts could be even more challenging (Su Ping et al., 2020). A majority of EFL teaching methodologies fail to develop writing skill or neglect the abilities required for L2 writing (Wu V. W.-C. et al., 2020; Mirzaei et al., 2022). Despite the fact that intermediate level L2 students often feel dismayed by the lack of skills they possess in expository writing, college and university programs provide many remedial courses for L2 writers in order to help them overcome the inflexible cognitive demands of the writing skill (Awada et al., 2020). In this direction, a significant number of studies have addressed the positive impact of flipped classroom on students' writing performance (Alghasab, 2020; Judy Shih and Huang, 2020; Su Ping et al., 2020). For example, Alghasab (2020) investigated the impact of flipped classroom on EFL students' writing skill. Data collection was done by the use of questionnaires and semi-structured interviews. The

findings of this study revealed that students held positive perceptions of flipped classroom. Moreover, the flipped classroom environment provides students with useful learning opportunities alongside an increase in their motivation and communication. Additionally, Judy Shih and Huang (2020) carried out a qualitative research design to explore the effect of flipped classroom on EFL students' metacognitive strategies. The participants of this study were eight EFL students and the data were collected by the use of semi-structured interviews. The results indicated that flipped classroom allowed students to employ metacognitive strategies in a more engaging and effective manner. In another study, Su Ping et al. (2020) investigated the EFL learners' attitudes toward flipped classroom. Data were collected using semi-structured interviews and the results revealed that flipped classroom provided students with further time, further practices, interactive discussions, motivation, and instant feedback during class time. Consequently, students' attitudes were positive towards flipped instruction. These findings were also confirmed by Fathi and Rahimi (2020) who reported the effectiveness of flipped classroom in affecting writing performance of EFL learners.

Social media in L2 learning

As the Internet has induced a technology revolution and contributed to the ever-dominance of communication technologies for sharing information, social media have emerged as the affordable technology devices, leading to the more convenient access to information. Social media can be characterized as 'web-based or personal device-based applications that connect users with online resources' (Evans, 2014, p. 903). Social media, which are the Internet-dependent technology devices, can foster learners' engagement and cognitive development (Santovena-Casal and Bernal-Bravo, 2019). Adopting the Manca's (2020) conceptualization of social media in the educational contexts, the present researchers considered social media devices as Internet-based applications for sharing images (e.g., Instagram), video sharing applications (e.g., YouTube), and instant messaging applications (e.g., WhatsApp). Numerous researchers have verified the utility of social media in L2 learning (e.g., Kukulska-Hulme and Viberg, 2018; Reinhardt, 2019; Aloraini and Cardoso, 2020; Yeh and Swinehart, 2020; Barrot, 2021; Roohani and Heidari Vincheh, 2021). It is worth noting that social media is a vehicle for implementing flipped instruction in the present study.

Writing anxiety

Researchers have found that flipped classrooms could have a significant impact on L2 learning skills, including speaking and writing in addition to academic success (Boyraz and Ocak, 2017; Tseng et al., 2018; Sit and Guo, 2019; Fathi and Rahimi, 2020; Jiang et al., 2022). Because L2 writing is so demanding and requires

numerous language competencies like task achievement, coherence and cohesion, vocabulary, grammatical range, accuracy, it creates a high level of writing anxiety (Baepler et al., 2014; O'Flaherty and Phillips, 2015; Fareed et al., 2016). Generally, *writing anxiety* is defined as an aversion to writing and situations in which some amount of writing is perceived by the individual, along with the potential for evaluating that writing (O'Flaherty and Phillips, 2015; Fareed et al., 2016). This avoidance is likely to lead to a fear of the writing process outweighing the projected benefits of writing ability (Thompson, 1980; Fathi and Khodabakhsh, 2020). Since L2 writing entails complex cognitive processes that can cause frustration and difficulty for L2 students at any proficiency level, L2 writers perceive it as a particularly challenging language skill (Baepler et al., 2014; Fareed et al., 2016). Writing anxiety has been considered by a variety of researchers as a multidimensional construct encompassing several dimensions. As revealed by Rankin-Brown (2006) writing anxiety involves the frustration of assessing one's own writing quality and comparing it to one's expectations, the fear of teacher's feedback, the fear of peer feedback, and the fear of losing one's identity. A person with writing anxiety is likely to have apprehensions and unpleasant feelings that can adversely affect the writing process (Zheng and Cheng, 2018). When completing L2 tasks, learners with writing anxiety often experience low self-esteem, apprehension, tension, procrastination, avoidance, and withdrawal (Cheng, 2004). It is argued that writing anxiety is caused by an individual's writing ability, readiness to complete the writing task, and fear of being judged or evaluated by others (Cheng, 2004). In addition, Cheng (2004) considered L2 writing anxiety to be a three-dimensional construct. Based on the physiological, cognitive, and behavioral aspects of writing anxiety as well as how these dimensions influence L2 writing outcomes, Cheng (2004) claimed that L2 writing anxiety is rooted in the belief that anxiety experiences like nervousness and tension have physiological effects, negative emotions about others' expectations, and avoidance to perform a particular behavior. According to other studies (e.g., Rankin-Brown, 2006), some more factors can cause L2 writing anxiety such as low self-esteem, limited linguistic proficiency, and low self-efficacy. Given the importance of writing anxiety in L2 learning, some researchers have argued that flipped classroom might be an effective teaching method which can alleviate this type of apprehension in L2 context (Xu and Qi, 2017; Tseng et al., 2018).

Materials and methods

Study design

This study is a quantitative, quasi-experimental research. As the participants were the students of two intact classes and it was not possible to select and divide the participants randomly in this language school, the researchers employed a quasi-experimental pretest-posttest non-equivalent groups design. This research design is normally used in contexts where it is not logistically feasible to conduct a randomized, controlled trial research (Ary et al., 2018). In this design, the researchers compared the performance of an experimental group and a control group on two measures (i.e., writing performance and writing anxiety) gathered before and after the experiment.

Participants

In order to accomplish the aims of this quasi-experimental study, a sample of 50 Chinese EFL learners from two intact classes of a language school in Hunan province, China were selected as the participants. Convenience sampling method was employed to select these participants since this sample was more available for the research team. The participants of these two intact classes were assigned to a control group ($n = 24$) and an experimental group ($n = 26$). The sample was comprised of both male and female EFL learners whose ages varied from 19 to 24 ($M = 21.62$, SD = 3.92). This language school was primarily concerned with preparing the upper-intermediate Chinese EFL learners to get ready for the TOEFL exam. More precisely, the purpose of this course that the two classes had enrolled in was to increase writing skills of the TOEFL applicants *via* an intense writing course. The students had previously studied English during their school days. According to the students' self-report, the students had not previously experienced being taught based on flipped writing instruction. The two classes were taught by a 35-year-old male English teacher who cooperated with the researchers in accomplishing the objectives of this study. The teacher was a trained TOEFL instructor who had the experience of using technology and flipped instruction in his previous courses. After obtaining his informed consent, the researchers provided him with the general explanation and guideline of the purpose of the research and the procedures he needed to employ in each class.

Study variables

In this research, the independent variable was the mode of instruction, with two levels (i.e., flipped classroom or conventional classroom), a categorical variable. Writing performance and writing anxiety were the two dependent variables under investigation. The former was measured with timed writing tasks and the latter was evaluated by administering a previously designed Likert-scale questionnaire of L2 writing anxiety.

Instruments

Language proficiency test

Because the general language competence of the participants could affect their writing skill, participants overall English proficiency was measured *via* administering Oxford Placement

Test (OPT; Allan, 2004). OPT is characterized as a reliable and valid measure of English proficiency widely used as a placement test for various learners of English (Allan, 2004). The mean scores of the two groups obtained from OPT were compared by running an independent samples t test whose results showed no significant difference between the two groups, confirming the homogeneity of the participants with regard to general English proficiency. The internal consistency of OPT, as estimated by Cronbach's alpha, was 0.82 in this study.

Timed writing tasks

In order to measure the writing performance of the Chinese EFL students, two 40-min writing tasks were utilized as the pre-test (Task 1) and post-test (Task 2) of this research. The reason for using two separate writing tasks for pre-and post-tests was to avoid test effect as the potential internal validity threat (Ary et al., 2018). The topics of the timed tasks were selected from sample TOEFL writing essays and did not need specialized schematic knowledge. The participants were requested to write at least 400 words for each task. The two tasks were as the following:

Task 1: Some individuals prefer to get up early in the morning. Others tend to get up later in the day. Which one do you agree with? Use specific reasons to justify your choice.

Task 2: Some individuals prefer to travel with a companion. Others like to travel alone. Which one do you agree with? Use specific reasons to justify your choice.

The completed writing tasks of the participants were marked using Jacobs et al.'s (1981) rubric which is based on an analytical scoring method. This writing scoring rubric evaluates the quality of written texts in terms of content, language use, organization, vocabulary use, and writing mechanics. The inter-rater reliability was assured by inviting two other trained raters for scoring the timed writing tasks independently. Cohen's Kappa's formula was used and it demonstrated an acceptable level of rater consistency ($a = 0.83$).

Writing anxiety inventory

English as a foreign language students' writing anxiety was gauged using Cheng's (2004) L2 Writing Anxiety Inventory. This inventory includes 22 statements assessing three components of *somatic anxiety*, *cognitive anxiety*, and *avoidance behavior*. Each statement is evaluated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). This scale was given to the participants of the two groups twice, as pre-and post-tests. The reliability coefficients of the scale were 0.83 and 0.86 before and after the treatment, respectively.

Experimental procedure and data collection

As discussed above, the purpose of the course, which lasted for about 3 months, was to help EFL students to improve their writing abilities by practicing to write various types of paragraphs and essays.

To this aim, the instructor asked the students to do various writing tasks regarding different kinds of paragraphs such as comparison and contrast, expository, argumentative, process, definitional, and narrative paragraphs. Also, the EFL learners were taught how to outline an essay, develop its different sections (e.g., introduction, body, and conclusion), and revise the written texts. The same textbook and course materials were used for both groups who were instructed by the same teacher. The experiment began in late March of 2022 and was finished in early June. There were equal 16 sessions of procedure for each group, two of which (i.e., the first and the last sessions) were devoted to administering pre-and post-tests.

Micro-lecture videos and their delivery method

Concerning the specific purpose of the study, the researchers used Bergmann and Sams's (2012) model of the flipped classroom. Based on this model, the experimental group were provided with previously created/prepared videos and clips taken from Internet, especially YouTube, or selected from the previously held online classes of the instructor. Some clips were also adapted from social media such as Instagram, Facebook, and WhatsApp/Telegram Channels. The duration of video clips ranged from 15 to 30 min. The students were given clips before each session and were required to watch them and do the worksheet exercise before attending the class. The worksheet completion by the flipped group could indicated that the students have watched the videos before coming to the class.

In-class activities

Each session of the experimental group lasted about 90 min. During the class time, the instructor first ensured that the students had covered and understood the content of the video clips by checking students' worksheets or asking some questions (20 min). Afterwards, the students were involved in group discussions related to the content of the video clips in addition to doing the corresponding exercises of the textbooks collaboratively (60 min). In fact, the students were divided in small groups for the collaborative completion of the tasks. At the end of each session, the students were provided with a brief introductory explanation of the topics/tasks for the next session (10 min). As the students were exposed to videos in advance, the flipped group had further time to do in-class activities and receive peer and teacher feedback.

Non-flipped group

On the other hand, the control group students received the same instructional materials and tasks that the flipped group did. However, no videos or materials were given to the students prior to the class. Each session of the non-flipped group also lasted for about 90 min. First, the content of videos was explained by the teacher *via* lectures or PowerPoint presentations (30 min). After that, like the flipped group, the non-flipped class collaboratively completed the corresponding worksheets of each session (20 min). Finally, the students of the non-flipped group were also engaged in doing the same writing tasks and exercises inside the classroom collaboratively (40 min). They also wrote the essays after

experiencing the sequential stages of rehearsing, drafting, redrafting, and revising. Since the non-flipped group were not exposed to the videos and class contents, they had less time (i.e., 20 min less than the time of the flipped group) to practice or do written tasks compared to their counterparts in the flipped group. As a result, the number of completed tasks or written assignments in the control group was fewer than those in the experimental group. The instructional procedures of flipped and non-flipped groups is presented in Figure 1.

Teaching materials

The main coursebook was Lougheed's (2008) book entitled *Barron's Writing for the TOEFL IBT: With Audio CD*. This book intended to enhance writing skills of the students to get better scores on writing tasks. The manual was structured simply in a step-by-step fashion to help EFL learners to develop ideas, organize details, and write them into vivid, well-organized English. The book also provided the learners with model essays and writing exercises to get more familiar with well-structured writing tasks.

Data analysis

The gathered data were fed to SPSS (version 22.0) for statistical analysis. Both descriptive statistics (means and standard divisions) and inferential statistics were taken into consideration. Concerning the inferential statistics, paired samples t-tests and the analysis of covariance (ANCOVA) were performed to analyze the effect of the independent variable on the two dependent variables. According to Pallant (2020), ANCOVA can be used when there is

a pre-test/post-test design in which the pre-test scores are regarded as the covariate. In this analysis, the independent variable was the teaching type (i.e., flipped or traditional) and the dependent variables were writing performance and writing anxiety scores measured at the end of experiment. As required by ANCOVA analyses, some preliminary checks were made to ensure that the assumptions were all met. For this purpose, the assumptions of linearity, normality, homogeneity of variances, homogeneity of regression slopes, and reliable estimation of the covariate were all checked.

Results

Concerning the data analysis for the investigation of the impact of a social media-supported flipped L2 writing course on the writing performance and writing anxiety of the EFL participants, both descriptive (mean and standard deviation) and inferential statistics were taken into account. In addition to paired samples t-test, ANCOVA was conducted to identify the effects of the flipped instruction on the writing skill and writing anxiety of EFL learners. In fact, two ANCOVAs were performed to explore the effect of flipped classroom on the two dependent variables of writing performance and writing anxiety. The pre-test scores were considered as the covariates and the posttest scores were the dependent variables in the analyses.

As far as the effect of social media-supported flipped classroom on the writing performance was concerned, the descriptive statistics demonstrated that the mean score of the experimental group underwent a bigger increase than the control

FIGURE 1
Instructional procedures of flipped and non-flipped groups.
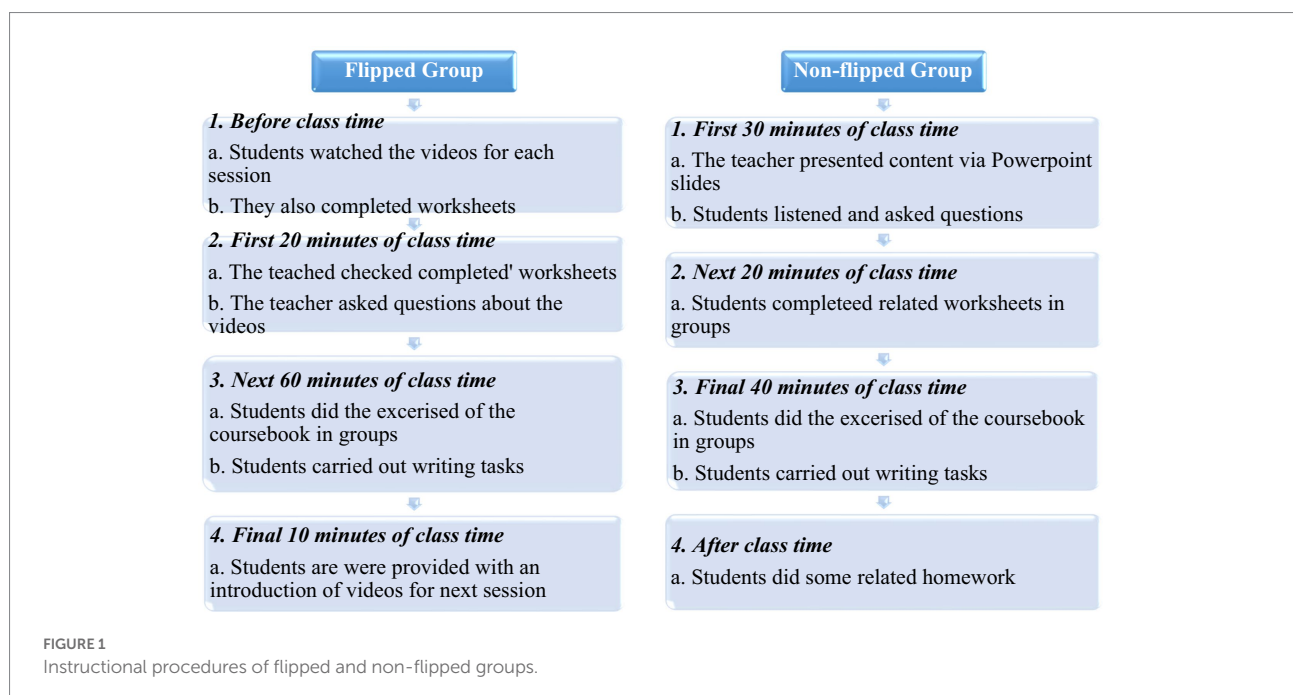
TABLE 1 Descriptive statistics of the two groups.

Groups	Scales	Pre-test		Post-test	
		M	SD	*M*	SD
Experimental	Writing skill	52.6	10.9	69.1	11.1
	Writing anxiety	38.8	7.3	25.9	5.7
Control	Writing skill	51.0	9.8	60.1	10.1
	Writing anxiety	37.0	6.9	32.1	7.3

TABLE 2 Paired samples *t*-test results, examining the differences between the pre- and post-tests of the two groups on the writing performance.

	Pre-test		Post-test				Cohen's *d*
	M	SD	*M*	SD	*t*	*p*	
Experimental	52.6	10.9	69.1	11.1	−4.2	0.000	0.52
Control	51.0	9.8	60.1	10.1	−2.3	0.022	0.33

TABLE 3 ANCOVA results, investigating the effect of flipped classroom on the EFL students' writing performance after controlling for the covariates.

Source	Type III Sum of Squares	*df*	Mean square	*F*	Sig.	Partial Eta squared
Covariate (pre-test)	3.22	1	3.22	0.07	0.86	0.00
Between-subjects	526.00	1	526.00	10.12	0.000	0.21
Within-subjects	2152.02	48	52.35			

group. As shown in Table 1, the mean score for the writing performance of the experimental group increased from 52.66 (SD = 10.5) on the pre-test to 69.12 (SD = 11.1) on the post-test. Likewise, the mean score of the control group rose from 51.08 (SD = 9.8) on the pre-test to 60.13 (SD = 10.1) on the post-test. As indicated in Table 2, the results of paired samples t-test also indicated that there was a significant change in the writing mean scores of the experimental group ($t = -4.2$, $p < 0.01$, $d = 0.52$). Likewise, the increase in the writing mean scores of the control group was significant ($t = -2.3$, $p < 0.05$, $d = 0.33$).

However, ANCOVA results verified that there was a significant difference between the two groups on post-test mean scores of writing performance, $F(1, 48) = 10.12$, $p = 0.000$, partial eta squared = 0.21; as seen in Table 3. This outcome showed that the EFL students of the experimental group improved their writing performance substantially more than the control group participants, confirming that the social media-supported flipped writing instruction contributed to enhancing the writing competencies of the EFL students.

The second purpose of the research was to explore the effect of flipped teaching on the L2 writing anxiety of the EFL

participants. As seen in Table 1, the descriptive statistics shows that the mean score of the L2 writing anxiety of the experimental group decreased from 38.87 (SD = 7.37) on the pre-test to 25.92 (5.72) on the post-test. By the same token, the mean score for the control group decreased from 37.01 (SD = 6.59) on the pre-test to 32.16 (SD = 7.38) on the post-test of L2 writing anxiety.

In addition, as presented in Table 4, the results of paired samples t-test demonstrated that a significant change was found in the writing anxiety mean scores of the experimental group ($t = 5.67$, $p < 0.01$, $d = 0.43$). Similarly, there was a significant decrease in the writing anxiety mean scores of the control group ($t = 2.27$, $p < 0.05$, $d = 0.19$).

Moreover, ANCOVA was performed by adjusting for the pre-test scores of writing anxiety. The results (as shown in Table 5) demonstrated that a substantial difference was found between the mean scores of the two groups in terms of writing anxiety, $F(1, 48) = 7.12$, $p = 0.003$, partial eta squared = 0.18). This outcome indicated that social media-supported flipped classroom was useful in reducing the writing anxiety of the Chinese EFL learners.

Discussion

This quasi-experimental study aimed to explore the effects of a flipped writing course on the writing performance and writing anxiety of Chinese EFL students. The results obtained from paired samples t-tests and ANCOVAs yielded significant findings. First, the findings indicated that social media-supported flipped classroom significantly improved the writing performance of Chinese EFL learners. These results lend support to the outcomes of numerous studies focusing on the effect of flipped classroom on the writing skill (Wen, 2013; Mok, 2014; Leis et al., 2015; Mehring, 2016; Arifani et al., 2020; Fathi and Rahimi, 2020; Liu et al., 2022). As reported by Fathi and Rahimi (2020), flipped classrooms developed the writing skills of EFL students better than non-flipped classrooms and one possible justification for this finding was attributed to the assignments carried out by students in flipped and non-flipped classrooms. As a result of using non-flipped instruction, EFL students did their homework independently after the class. Therefore, there was less peer or teacher evaluation and students were rarely able to evaluate their tasks. However, the EFL students in the flipped classroom had an opportunity to have further interaction with the material, their peers, and the instructor than they did in the non-flipped classroom since they could view the videos whenever they wanted and at their own pace, thereby becoming well prepared for the class activities (Mok, 2014; Mehring, 2016; Luo et al., 2020; Yang and Chen, 2020). Consequently, in the classroom, the students' output could serve as a starting point, which would motivate them to participate in different class activities. Additionally, the flipped group had further exposure to feedback and task-oriented inputs (Wen, 2013) than the non-flipped group. This instructional procedure also helped the students to do the tasks collaboratively, and in some cases, helped them become more confident EFL

TABLE 4 Paired samples *t*-test results, examining the differences between the pre- and post-tests of the two groups on the on the writing anxiety.

	Pre-test		Post-test				Cohen's *d*
	M	SD	*M*	SD	*t*	*p*	
Experimental	38.87	7.37	25.92	5.72	5.67	0.001	0.43
Control	37.01	6.95	32.16	7.38	2.27	0.031	0.19

TABLE 5 ANCOVA results, investigating the effect of flipped classroom on the EFL students' writing anxiety after controlling for the covariates.

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial Eta squared
Covariate (pre-test)	132.165	1	132.16	91.38	0.62	0.00
Between-subjects	10.324	1	10.32	7.12	0.003	0.18
Within-subjects	63.198	48	2.83			

learners. Moreover, it is possible that the results are influenced by the students' high motivation and engagement in flipped classrooms (Chen Hsieh et al., 2017). According to Chen Hsieh et al. (2017), the students in flipped classrooms spent a lot of time on pre-class activities that would allow them to perform the in-class activities more successfully. Therefore, in the class, the students were fully engaged in several class activities, enabling them to perform the class tasks more effectively and meaningfully. Additionally, further assistance as well as feedback was provided to the flipped group students by the instructor. On the other hand, students in the non-flipped classroom were less involved in class activities than the students in the flipped classroom. It was because the students in the non-flipped classroom had no pre-class tasks, and thus were not fully prepared for class activities (Wen, 2013; Fathi and Rahimi, 2020). In addition, having more time to prepare for the lessons before class and receiving immediate feedback from the instructor and peers during class could have motivated the EFL students to write more effectively in class (Su Ping et al., 2020). When the students were discussing the topics, sharing ideas, and practicing writing together, they felt more engaged and interested in class activities. Overall, students of the flipped group might have felt better and gained high levels of confidence and motivation in writing, resulting in their better writing performance at the end of the course.

The second purpose of this study was to explore the impact of social media-supported flipped classroom on writing anxiety of EFL learners. The results showed that flipped instruction effectively reduced EFL students' writing anxiety. As mentioned by some researchers (e.g., Thompson, 1980; O'Flaherty and Phillips, 2015; Fathi and Khodabakhsh, 2020), writing anxiety is an aversion to writing and it is likely to lead to a kind of fear in the

writing process. This fear can hinder students from learning to write. *Via* flipped instruction, students are likely to feel less pressure to rush and they could do their writing homework at home more peacefully and conveniently. On the other hand, shy students in traditional classrooms might be worried about their writing outcomes evaluated by the teacher and peers (Wen, 2013), as a result, they prefer not to write instead of making possible mistakes. Moreover, in the traditional classrooms, the required time for doing the writing tasks is stable for all the students, neglecting the fact that some students might require more time for brainstorming than others. However, by the use of flipped instruction, students' individual differences are taken into account, contributing to decreasing their writing anxiety. As a result of using flipped instruction and being fully prepared for the class, students' inspiration, self-awareness, and self-confidence are enhanced, all of which might have helped in reducing writing anxiety of the experimental group students. Taken together, the findings can be justified in light of SDT (Deci and Ryan, 1985) by positing that flipped classroom might have provided the Chinese EFL learners with a sense of autonomy, which in turn could have influenced their motived behavior in L2 writing, resulting in their greater engagement, better writing, and reduced anxiety. Also, from a broader perspective, the findings of this study, which revealed that social media-supported flipped learning was effective to be employed for EFL writing classroom, can support the extant literature (e.g., Rosell-Aguilar, 2018; Barrot, 2020, 2021) evidencing the benefits of using social media for L2 learning.

Conclusions and implications

The findings of this study offered empirical support for the effectiveness of flipped instruction in an EFL context in general and in wiring classrooms in particular. The findings suggest several implications for EFL researchers and instructors. First of all, social media-supported flipped instruction might have some merits for EFL students especially for EFL writing courses as it was found to be effective both in enhancing writing skill and in decreasing writing anxiety of EFL students. Second, this mode of instruction gives a sense of direction to instructors by helping them not only plan and prepare materials for the class, but also scaffold students' learning during the class. Third, given the detrimental effects of L2 anxiety, students should be taught how to deal with anxiety, or the teacher can create a less distracting environment in the classroom. Flipping the classroom can create a less stressful classroom environment in which assignments are not delegated and students can study in a learner-centered environment alongside their peers and teacher. Although the instructor maintains the role of director and students interact with the teacher in a formal setting during the class time, the flipped classroom allows the teacher to serve both as facilitator as well as an observer, resulting in greater engagement between students and the instructor. As a result, flipped classrooms offer a flexible environment conducive to reducing anxiety and boosting students' self-esteem and

performance. Having been taught based on flipped instruction, EFL students with low proficiency levels might become more motivated to write since they have more time to prepare for lessons before class and receive immediate feedback from their instructor and peers during class, which can scaffold their learning. In addition, students need to understand the rationale behind flipped classroom in order to engage effectively in class activities, and instructors can improve students' participation by creating motivation and encouragement.

This study has provided a better understanding of the impact of social media-supported flipped classroom on L2 writing performance and writing anxiety of EFL learners, but further research is still required to reach more conclusive results. As such, some limitations can be mentioned in this regard. First, the researchers employed quantitative research method to address the research questions in this study. Therefore, future researchers can gather qualitative data to clarify the effect of flipped classroom in EFL contexts more vividly. Also, it is worth considering that the relatively small sample size might be a concern in this research. However, it is generally argued that the minimum number of 30 participants might suffice for quasi-experimental or *ex post facto* studies (Dornyei, 2007). In addition, it should be noted that as the sample size in L2 writing classes is usually small (Lin, 2014), the sample size of the present research seems to be acceptable. Therefore, future studies may investigate flipped classroom method and anxiety among larger samples in different learning contexts. The flipped learning research could benefit from investigating the effect of different online learning environments comparatively and how they can influence anxiety levels of the participants. Finally, employing longitudinal studies will offer deeper insight into the effect of flipped instruction on L2 learning outcomes.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by Management Department, Ordos Institute of Technology, Ordos 010071, Inner Mongolia, China. The patients/participants provided their written informed consent to participate in this study.

Author contributions

XZ and YY carried out data analyses and wrote the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The use of Messenger for research collaboration: An auto-ethnographic study

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The use of social media for the collaboration of academics has been increasing in recent years. However, there are no reported studies on using Messenger as a collaborative platform to write and publish journal articles and apply for research and development grants. We use an auto-ethnography to reflect on our experiences over the last 3 years, using Messenger as our medium for our ongoing collaborative research activities. Our results highlight the benefits and challenges of using social media for this engagement. The capabilities of Messenger, as opposed to traditional correspondence through email, have paved our preference to use this platform. We can engage in dynamic collaboration and focussed discussion with less formal communication conventions through Messenger. In addition, the extra features, including easy phone calls, sending links, resources and screenshots, and using emojis and stickers for more socially cohesive interactions, are valued features of Messenger. We used the activity theory to highlight the interrelationships of factors (i.e., personal, social-emotional, structural, technological, and organisational) contributing to the success of collaborative academic activities, including the successful publication of journal articles and securing research and development grants. The findings of our study significantly contribute to understanding how social media can be effectively used for academic engagement.

KEYWORDS

social media, Messenger, academic work, publishing, collaboration

1. Introduction

The use of social media in education is increasing as it provides alternative platforms for learning, teaching, and assessment (Miller and Olthouse, 2013; Kio, 2015; Yuk and Yunus, 2021). The preference for using social media to support learning and teaching activities is underpinned by the preferences of teachers and students due to their affordances, including their capacity for both synchronous and asynchronous engagements (Breunig, 2016), easy navigation (Tran and Lyon, 2017) and linking to other online resources (Gorska et al., 2020), accessibility (Onuoha et al., 2021), and interactivity (Kaplan and Haenlein, 2014).

There are also other uses of social media besides learning, teaching, and assessment. Some studies demonstrate the intersections between social media and research and engagement. For example, Jordan (2022) explores academics' perception of what constitutes research impact through social media and how different platforms mediate their perception. There is also evidence that academics use social media for other purposes besides learning and teaching. These include professional development (McPherson et al., 2015; Dermentzi et al., 2016) for research collaboration, including finding, interacting, and supporting other academics and working collaboratively with other researchers (Jordan and Weller, 2018), enhancement of their reputation (Knight and Kaye, 2016), networking (Dermentzi et al., 2016; Donelan, 2016), and sharing of research output (Elsayed, 2016). Whilst academics' use of social media continues to rise, the theorisation on how academics use it for research collaboration, particularly collaborative writing to enhance their publication remains lacking.

Collaborative writing is composed of several activities, including brainstorming, conceptualising, outlining, drafting, reviewing, revising, and editing (Berndt, 2011). Collaborative research writing is effective in meeting the academics' demand for publication. It offers a supportive environment, maintains momentum, enhances individual and team motivation, and increases the accountability of everyone to complete the assigned task (Ness et al., 2014). More traditionally way, these processes occur face-to-face. However, given the demands for international collaborations and researchers' geographical location, these processes shifted online, allowing for greater flexibility and wider reach for other researchers who want to engage in producing academic papers together. In the digital age, collaborative writing has become accessible, providing people with various alternative platforms, including social media (Suominen and Jussila, 2018).

We aim to reflect on our experiences using Messenger for a specific type of collaboration in our academic work. Specifically, through reflection and analyses of our personal experiences, we provide critical insights into how Messenger has been pivotal in accomplishing our aims to publish journal articles and apply for a research grant. We answer the following research questions:

1. What are our motivations for engaging in collaborative research publication?
2. How does Messenger facilitate accomplishing our goals of publishing papers?

To provide context for this paper, the first author is a senior lecturer at one of the top universities in Australia who has supervised the second author in her Ph.D., a lecturer at one of the universities in Asia. Before using Messenger for our collaboration, we used email and Zoom to collaborate in our previous publications. Our shift to using Messenger is driven by our aim to increase our publications, which we need a more accessible and helpful platform. Our use of Messenger has been influential in our success for 1 year in publishing four research articles and one educational blog and securing research and development funds within 1 year. Most of our communication and interactions happen in Messenger, from conceptualising, writing, finalising, and editing our papers. In this paper, we focus on how Messenger enables and supports the processes, products, engagement, and commitment for ongoing collaborative work to publish and secure research grants.

2. Literature review

In this section, we present our literature review on the use of social media for research collaboration, the nature of collaborative writing and the emerging evidence that support the use of social media for collaborative research writing.

2.1. Social media for research collaboration

The use of social media in daily activities has increased, and Statista (2021) predicts that social media users will be 4.41 billion worldwide by 2025. Waite (2021) highlights using the Internet as a successful tool for research purposes. In the academic field, although most researchers use social media for everyday activities rather than research and teaching (Gu and Widén-Wulff, 2011), there are reports demonstrating the use of social media for research collaboration.

Social media have been an effective tool for researchers to communicate and collaborate with other researchers (Onuoha et al., 2021), including seeking information and interacting socially (Lamberton and Stephen, 2016). In addition, they are useful for identifying research opportunities and disseminating research findings (Rowlands et al., 2011). Researchers have better access to calls for research grants and research findings shared in social media. Furthermore, the use of social media shapes researchers' identities (Lamberton and Stephen, 2016). Their profiles become more prominent, and their research programs and outputs are widely circulated and known in the academic community.

The use of social media for research collaboration allows for greater flexibility. They enhance collaboration and sharing of documents with other researchers regardless of location (Hobson and Cook, 2011; Skaržauskienė et al., 2013). Researchers in different time zones can take advantage of an asynchronous collaboration (Breunig, 2016). The virtual collaboration offered by social media enhances researchers' productivity (Chui et al., 2012). There is also a report that

engaging in social media can enhance trust, which is an important foundation for collaboration (Calefato et al., 2013). The openness of each other on social media makes them trust their collaborators.

Examples of social media used for research collaboration include Facebook, Twitter, LinkedIn, WhatsApp, ResearchGate, and Mendeley, have been used. These social media platforms enhance information sharing, informal scholarly communication, and research collaboration (Thelwall and Kousha, 2015). Kuteeva (2016) highlights that "Twitter is used to mediate the daily routines of scientific work and to keep researchers and collaborators connected, often at academic events" (p. 440). Researchers use Facebook to disseminate research findings, including advertising their publications (Kortelainen and Katvala, 2012) and sharing information (Junco, 2012). Onuoha et al. (2021) found that WhatsApp is the most popular social media platform for research communication, networking and sharing documents. Other platforms are also used. According to Gorska et al. (2020), researchers use platforms that specialise in academia, although the interaction activities are not as well-developed as Facebook or Instagram. For example, the use of ResearchGate and Mendeley have been used more by researchers to network with an academic audience.

2.2. The nature of collaborative research writing

Collaborative research writing is "an iterative and social progress that involves a team focussed on a common objective that negotiates, coordinates, and communicates during the creation of a common document" (Lowry et al., 2004, p. 72). In other words, collaborative writing is a social activity undertaken by people working on producing a shared document (Gimenez and Thondhlana, 2012). According to the strategies highlighted by Lowry et al. (2004), there are single author writing (only one person writes the paper on behalf of a team), sequential writing (a sequence has written a paper of authors involved in a paper), parallel writing (more than one author work on the paper at the same time), and reactive writing (authors in a paper react and adjust to each other's writing). In a more systematic way, collaborative writing is initiated when people start brainstorming about the possibility of writing a research paper together and completed when revising, editing, submitting, and responding to the reviewers' feedback (Berndt, 2011). The whole cycle may take longer, and the collaboration may even continue after the paper has been published.

Collaborative research writing is one of the strategies used to increase academics' number of journal articles published. Ness et al. (2014) argue that collaborative research writing offers wider benefits than sole authorship. When academics agree to venture into co-authorship, the collaborative nature of

writing offers supportive environment for all while increasing the accountability of everyone to complete their assigned tasks on time. Apart from the actual writing processes, there are other processes occurring that impact the success of collaborative research writing. According to Rhodes and Lin (2019), the negotiation of roles and responsibilities is sometimes difficult, and hence, usually, the collaboration is "based on a foundation of friendship and a shared belief in the co-construction of knowledge (p. 72)." They recommend that collaborators build mutual respect and shared values before starting a collaborative research writing work.

2.3. Affordances of social media for collaborative research writing

In the study of McGrath (2013), McGrath highlighted the importance of collaborative writing and the effects of digital tools. Similarly, Hynninen (2018) investigated the impact of digital tools on research writing. In Hynninen's study, the participants used Slack, a team collaboration tool, to organise writing in the research group. Then, they used Overleaf, a cloud-based collaborative writing tool, for collaborative writing. For communication purposes, they used email, Skype, and Twitter in writing, evaluating and discussing the results and achievements. Also, Facebook was used for private communication among participants. Twitter was used for different functions, including finding and sharing research-related resources.

Social media have affordances that can facilitate collaborative research writing. The interactive platforms of social media provide an opportunity for academics to discuss and negotiate their ideas (Bjørn and Ngwenyama, 2009). Social media better support the dynamic nature of discussion and negotiation compared to face-to-face collaborative research writing. Also, the possibility of collaborating with other academics in many parts of the world will provide better access for new academics to experts' knowledge, skills, and experiences from more senior academics (Gorska et al., 2020). Woolley et al. (2010) argue that emerging researchers have the limited social capital to involve in international teams. Thus, if there is a collaboration between early career researchers and experienced researchers, early career researchers will be guided and taught by more experienced researchers (Waite, 2021). However, some researchers may have competitive pressures in collaboration using social media. As their research identities become more visible online, other collaborators tend to disengage due to competition and comparison (Jamali et al., 2014).

Although different types of social media are evident in literature, to the best of our knowledge, there have been little to no studies about using Messenger as a platform for collaborative research writing.

3. Materials and methods

We adopt an autoethnography research design to critically reflect on our experience for the last 2 years in using Messenger for collaboration to write and publish journal articles and apply for research and development grants. Autoethnography is a research method that "entails the scientist or practitioner performing narrative analysis pertaining to himself or herself as intimately related to a particular phenomenon" (McIlveen, 2008, p. 15). This research methodology has been applied in various context including transdisciplinary research in collecting and analysing self-reflection from social and natural scientists for transformative change (Haeffner et al., 2022), examining professional identity tensions of transnational teachers (Yazan et al., 2022), exploring the experiences of international students to transitioning to an academic job in the university (Consoli et al., 2022), bringing perspectives of humanities into computer education (Bernard, 2022), leading a whole-school reform (Alonzo et al., 2021), and many others.

3.1. Theoretical framework

Engeström's (1987) activity theory was chosen as a framework for this study, based on Vygotsky's (1978) conceptualisation of the primacy of culture rather than individual cognition in mediating action, learning and meaning-making. In this theory, the social interactions of individuals within the community facilitate the activity. This model is useful for understanding how different factors influence various socially and culturally mediated activities to achieve the intended outcomes.

Activity theory has been applied in many areas of social research and human-computer interactions, including implementing educational reforms (Alonzo et al., 2021), sustaining professional learning partnerships (Bloomfield and Nguyen, 2015), describing and analysing out-of-school learning through digital learning (Li et al., 2022), explaining the increasing processes of unbundling, digitisation and marketisation in higher education (Cliff et al., 2022), and among others.

This theory describes the roles of the objects (experiences, knowledge, and physical products), tools (documents, resources, etc.), and community (people or stakeholders). The subjects, the people engaged in the activity, work as part of the community to achieve the activity's objective or outcome. The quality of the interactions among objects, tools, and the community determine the quality of the outcomes. Thus, this analytical framework is useful for reflecting on different elements of social learning systems to understand the patterns of social activities and development, consequently bringing the intended outcomes.

The activity theory is useful in our auto-ethnographic study. The research collaboration we have undertaken is both cognitive and social-emotional activities. To understand the role of the Messenger in shaping our collaborative partnerships and meeting our targets, our critical reflection accessed our internal processes. In this paper, we are the subjects engaged in collaborative research to write academic papers for publication and secure research and development funding. Through our reflection and using the activity theory, we have identified different factors, particularly the affordances of the Messenger in facilitating our collaborative research work, and how these factors influence our socially and culturally mediated activities to achieve our pre-identified outcomes.

3.2. Data collection

This research places our experiences at the centre of data collection (Cohen et al., 2012) through narrative and reflective pieces and the primacy object for analysis. We first developed guides for our reflections. These guide questions draw the following:

1. Our motivation for writing journal articles and applying for research and development grants.
2. Useful features of Messenger that make it better compared to traditional email.
3. Features of Messenger that are inappropriate for collaboration.
4. Additional features of Messenger that can make collaboration better.
5. Factors that increase engagement in Messenger for research collaboration.
6. How Messenger facilitates negotiation in research collaboration.
7. Recommended guidelines for using Messenger for research collaboration.

3.3. Ensuring trustworthiness of our research

Trustworthiness is a critical consideration in qualitative research with credibility, transferability, dependability and confirmability (Lincoln and Guba, 1985). We used these four criteria to ensure that our autoethnographic study, although based on our personal experience, has high validity and reliability. We adhered to these criteria throughout the completion of this paper, from reflecting to writing this paper.

We ensured credibility through our prolonged engagement in reflection. We compared our reflections and discussed our competing views. We did not aim to reach a consensus but to

acknowledge opposing views and frame them within the broader context of preference for using social media for specific research activity. These processes provide a measure of the truth value of our research, ensuring our findings are correct and accurate. Acknowledging our opposing views and reporting them in the paper enhances our credibility.

In terms of transferability, we used detailed descriptions, showing that our research findings can be applied to other academic collaboration contexts. When reading our responses to our guide for reflection, we negotiated unclear responses that needed a more detailed description. The adequate details of our contexts, purpose, targets, and activities for using Messenger allow our readers to make a judgement about whether our results are applicable to other contexts.

Furthermore, dependability was ensured by providing enough information for other researchers who want to do similar studies. We acknowledge that our views may not have captured the entirety of using Messenger for collaborative research work. Hence, we position this paper as an initial investigation that provides evidence of how it can facilitate deeper academic engagement. Through these processes, we have demonstrated the reliability of our research results.

One potential issue that we encounter is the conformability of autoethnography due to its overemphasis on self-narrative, which compromises its neutrality and the findings are based on our views and experiences. We acknowledged our potential bias and personal motivations in writing the findings. The agreed reflection guides provide data that reflect the information needed to answer our research questions. We did not use any other narratives apart from our individual and negotiated responses to ensure that the data included in this paper reflect our objective view.

3.4. Data analysis

We read, coded and sorted our reflections to determine categories that answer our research questions. After four iterations, we grouped our responses based on these codes and selected some quotes to embed in our results section. Our Research Question 1 were answered using two codes—personal and professional reasons. For Research Question 2, these include the features of Messenger that facilitate collaboration, additional features we want to have, and the consequences of using Messenger.

4. Results

Our paper aims to provide evidence of how Messenger can be used for specific academic work. Our reflection and analyses of our personal experiences provide critical insights into how

Messenger has been pivotal in accomplishing our aims to publish journal articles and secure a research grant. We present our critical reflection below following our guide questions.

4.1. Our motivation for research collaboration

This section answers our Research Question 1: *What are our motivations for engaging in collaborative research publication?* Although we differ in our career stages in academia, we share two common reasons for engaging in research collaboration: personal and professional.

4.1.1. Personal reasons

We are both motivated at a personal level to contribute to the knowledge economy. As one of the authors said, "I am happy when my papers get published, and I win grants (CZO)." This is our biggest source of motivation. As one of us narrated:

> *I am developing a strong research agenda in curriculum, assessment, evaluation, and teacher education and development. My personal aim is to contribute to discourses on these topics, and develop theoretical and practical knowledge with the ultimate aim of influencing learning and teaching practices of school leaders and teachers (DA).*

In addition, as we are both academics and teach in the area of teacher education and development, "we want to address issues that we have identified in the classroom (CZO)," and "our engagement in research will give me personal satisfaction that I was able to use my research skills to find possible solutions (DA)."

4.1.2. Professional reasons

As we are both employed in academia and are expected to engage in research activities, we "need to meet our performance indicators as part of accountability in our job (DA)." There is also a compelling reason for one of us to future employment:

> *As my goal is to work as an academic at one of the prestigious universities, I need to boost my curriculum vitae. I believe that publishing many papers and receiving funding will enhance my research track record. As an early career researcher, I need to build an exemplary research track to secure a better job and eventually for promotions (CZO).*

These personal and professional reasons drive us to find a platform that can enhance our collaboration for writing and publishing more papers. Previously, we have tried to use emails for correspondence, sharing resources, and sending reminders, but "I felt emails lack the human connection. It's very formal, and there is this feeling that conventions in sending emails

need to be observed (DA)." On the contrary, "email is fine, and it stores all our previous messages, easy to search previous messages (CZO)."

4.2. The role of messenger in our collaborative research work

This section presents our answer to Research Question 2: *How does Messenger facilitate accomplishing our goals of publishing papers and securing a research and development grant?* Our preference for using Messenger to facilitate our research collaboration is influenced by its affordances. The features of Messenger support our interactions across the stages of writing to publishing research papers.

4.2.1. Navigation

Using Messenger for collaboration takes away the formality of traditional email correspondence. "It is easy to navigate, and I can send a message even anytime I have a question (CZO)." As it is a stand-alone app available on mobile phones, it is easy to use without going to the Facebook app before accessing it. Its capacity "to store messages makes it ideal for shifting from mobile app to computer screen (DA)." This functionality is helpful when you are writing a paper and want to clarify something with your collaborators. There is no need to access the Messenger app on your phone while on your laptop or computer screen.

The simple layout of Messenger provides easy navigation. The search bar is helpful and makes it "easy to search someone or a group of people in the Messenger app and shoot a message anytime, anywhere (DA)." On the upper right-hand side features a phone icon that makes it easy to ring someone if a call is needed for further discussion.

4.2.1.1. Convenience

It is a very convenient platform for sharing files, links, photos, and screenshots. We both agree that the drag-and-drop function of

> If you are logged in to your computer, the links, files, and screenshots shared are easy to view without changing a window. You can read a certain section of the file shared and copy and paste in Messenger to facilitate thorough discussion or to support your viewpoint when a certain issue on the paper is being debated upon. It is also easy to drop a screenshot or take a photo when your argument needs further support (DA).

When you make mistakes, it is easy to retrieve the message by deleting it and editing it before resending it. Also, it is easy to remind your collaborator if they miss an important message

for discussion, "you can go back to your message and swipe left, then type a gentle nudge (DA)." In addition, the notification functions of Messenger are helpful, "getting your attention that someone sent you a message. It prompts you and gives you the push to check it and then reply (CZO)."

4.2.2. Synchronous and asynchronous chat

Messenger can integrate online and offline engagement. It provides an opportunity for synchronous and asynchronous discussions, resulting in dynamic and more focussed interactions. The synchronous chat simulates real-time conversation that allows "real-time feedback for our draft, facilitating broad, deep, and ongoing interactions (DA)." Also, "the synchronous chat makes it easier to negotiate on some issues in our research and papers and to reach a consensus if we needed to (CZO)." The "asynchronous chat is handy in our context as we are located in different time zones (CZO)." The 4-h difference presents a challenge for synchronous chat, and hence, "we just send messages any time of the day, and we reply at the time convenient for us (DA)." Although the synchronous chat is ideal than asynchronous chat, there is no expectation that you have to reply even when you see the message. The "seen" label is a great feature that signals the sender that the other person has read the message. "If you see that your message is seen, and there is no reply, then it signals that they are busy or in the middle of something (DA)."

4.2.3. Extra features

There are features that traditional email cannot do. These include making phone calls and using emojis and stickers, which enable more socially cohesive interactions. As summarised:

> When typing a message takes longer, and the competing viewpoint needs to be discussed thoroughly, a voice call is just a click away, without worrying about the expensive overseas charges as in the case of the regular phone call (DA).

We can express our emotions or feelings in the chat using emojis. Easy to let your collaborator know if you are feeling overwhelmed, happy, shocked, or sad about the paper. Easy to react to the message sent as well without typing what you want to say. The emojis "add life to the conversation as it gives emotions to the conversation that rather becomes intense especially when disagreements build up (CZO)." In addition, the emojis function for social cohesion as they are:

> authentic device to express what you think well. Writing research papers is not mechanistic or routinary, but involves lots of emotions and requires social support. The emojis allow you to express your appreciation, frustrations, and many other feelings (DA).

4.2.4. Accessibility

The accessibility of Messenger on mobile phones further facilitates our interactions:

> *Even when I am on public transport, and I think of something critically important for the project we are writing, I can quickly grab my phone and send message to CZO. It also serves as an excellent note-taking tool to dump all your ideas when you are on the go (DA).*

Also, it is easy to switch to your Facebook account to share your research output or work for wider reach and visibility. If our paper gets accepted, we post the link to the article to our Facebook account for wider reach.

The concept of accessibility in this research context can also be used to highlight the ability of Messenger to list the shared media, files, and links in its Html version. As we continuously engage in research and writing papers, we bring more resources to the conversation, including references for academic writing, exemplars of journal articles, methodology papers, and many other helpful resources to progress with our work.

4.2.5. Additional features of messenger for better collaboration

Although Messenger is loaded with features that facilitate our interactions, there are features that we want to see, including the capability to pin important messages for easier retrieval in the future. Also, it would be nice to see a recording capability of Messenger to record calls and discussions for reviewing in the future. It would be nice also if we could send a calendar invite or a reminder for meetings. In addition, it would be good if the messages could be organised based on threads or topics. This would be particularly helpful if multiple projects are discussed.

4.2.6. Cons of using messenger

As Messenger is inherently for social interactions, there is a high tendency for the conversation to go off the academic topic. On several occasions, our conversation had fallen off the topic, and we discussed other stuff unrelated to our research topic. There is also the risk of deleting the conversation, and once deleted, the entire thread is deleted. There is no restore button to retrieve the deleted thread. Also, some of our collaborators have no Facebook account. Hence, we have to revert to traditional email correspondence, which makes communication relatively slow, especially since we are from different time zones.

Throughout the period of our collaboration, we have negotiated the following guidelines for a more effective use of Messenger.

4.2.6.1. Expectations
- Everyone needs to check their Messenger regularly.
- If they are on leave or holiday, they need to inform in the chat of the period that they will not access Messenger.

- When asked in the chat, they need to reply to the thread for focussed discussion.
- There is no expectation for an immediate reply. You can reply at your convenient time. It must be recognised that everyone is working full-time with various commitments.

4.2.6.2. Rules for engagement
- Set boundaries. Collaborators must agree that the chat is restricted only to academic discussions. When the chat goes off the aim of the collaboration, then someone should call out and steer the conversation back to research.
- When responding to a message, the reply button should be used to establish a thread for individual messages.
- When starting a new conversation or a new topic, signal that it is unrelated to the previous messages.
- Although an immediate reply is not expected, collaborators should agree for a period to reply to any questions. In our case, we should reply within 48 h. After such a period, a reminder should be sent.
- We have never encountered profanity or inappropriate language use in our interactions. However, it must be agreed that inappropriate and offensive language use, bashing, and disrespectful behaviour must not be tolerated.
- Do not delete or delete any messages. Swipe it and retype the correct message.

4.2.6.3. Practical action
- Summarise key insights from the discussion. Share the summary with your collaborator and ask them if it captures all the insights.
- For shared files, photographs, and screenshots, download and save those important in your drive. This applies to key points raised at any point in the chat.

5. Discussion

Our auto-ethnographic study aims to reflect on our experience to address the paucity in the literature on how Messenger can be better used for collaborative research to increase our publications and apply for a research and development grant. Our research contributed to the growing body of literature on using social media for collaborative research (Thelwall and Kousha, 2015; Kuteeva, 2016; Onuoha et al., 2021).

As shown in our results, we can leverage the well-established functions of social media for professional development (McPherson et al., 2015; Dermentzi et al., 2016), research collaboration (Jordan and Weller, 2018), enhancement of their reputation (Knight and Kaye, 2016), networking

(Dermentzi et al., 2016; Donelan, 2016), sharing of research output (Elsayed, 2016) to a more strategic research collaboration by using it as a medium for writing and negotiating journal articles papers.

We interpret our reflections through the lens of activity theory, using its various components to highlight significant findings. Based on our reflection, achieving our goal, which is the *object* of our collaborative research work to write and publish journal articles, and a secure research and development grant requires that we have clearly established our motivation to engage in this work. Both personal and professional motivations (Zhou et al., 2022) are critical to establishing and sustaining our partnership. These sources of motivation provided the impetus for our collaborative research work and for finding an accessible and useful social media platform for our engagement.

The *object* of our collaboration was negotiated with a realistic expectation regarding the number of published papers in 1 year. We target top-quality journals, quartiles 1 or 2 only, to establish a benchmark for the quality of our work. As we are both the *subjects* for this engagement, it was easier to negotiate the goals and reach a consensus. The role of negotiation in research collaboration is critical (Hake and Shah, 2011), and in our engagement, Messenger provided the platform for negotiating all aspects of writing to publishing.

Messenger is the main *tool* for this collaborative research work, which also provides an overarching function for all research engagements. The affordances of Messenger provide the social aspects of collaboration, including initiating discussions, negotiating leadership, functions and contributions. It also provides administrative functions reminding collaborators to comment on issues and questions and complete the assigned tasks. Moreover, it functions as a repository of conversations, ideas, resources and meta-data of the chat. More broadly, it offers the technological component required for sharing resources, including other tools for collaboration like templates, academic writing resources and journal articles. The benefits of these social media functions in enhancing academic collaboration have been reported in the literature (Gorska et al., 2020; Onuoha et al., 2021).

The internal mechanisms constituted by the *rules* like conceptualising relevant research papers only, use of journal templates, targeting top journals, leadership and contribution for each paper, and the rules for engagement in the Messenger emerged through a collective agreement. They are agreed upon underpinned by our strong belief that they will help us achieve our aim. These rules have created clarity of expectations and built positive relationships between us. These rules develop over time and change upon negotiation to facilitate better collaboration. The rules followed by researchers in using social media for research collaboration enforce ethical norms and advance the professional practice (Zimba et al., 2020).

The partnership we have created built the *community* we need to achieve our goal. We have networked with the broader academic community to seek advice and feedback from other experts in our field. We have created another group chat in Messenger with these experts but with less expectations from them to engage. For others who prefer to use their email, we send our enquires or draft for their feedback. Our engagement with other experts is seen to be valuable as both of us are early career researchers, and we recognise that we need support through mentoring. Expanding our community to support our work is seen as critical in any collaboration's success (Jordan, 2022).

Our intellectual contributions, leadership for completing, and administrative functions from conceptualising to submitting our paper are negotiated and clearly articulated as *the division of labour*. Our specific roles for each paper constitute our professional contribution to our collaborative research work. The clarity of the division of labour and the trust we have established have enhanced our responsibility in our engagement. The clear articulation of roles builds partnership and avoids conflicts (Bagshaw et al., 2007), while the trust built among collaborators addresses power imbalances (Kerasidou, 2019). The relationships of these factors are illustrated in **Figure 1**.

As shown in **Figure 1**, the research collaboration we formed to build our publication and other research engagement is mediated by the rules, tools, division of labour, and the community we have established. The division of labour and the rules are negotiated and have emerged as a strategy to meet the object or goal of the activity. Negotiation is an ongoing process; thus, the division of labour and rules shift over time. This is an important feature of collaboration as the leadership of authorship in papers changes based on our interest and capability to lead. Over time, we have identified tools apart from Messenger. The tools we have identified and used include conceptual tools (e.g., academic writing resources, methodology papers), material tools (e.g., templates, exemplars of journal articles), and cultural tools (e.g., guidelines for using Messenger). The division of labour, rules, tools, and community shape how we, the subject, orient our collaboration to achieve our own goals. The activity systems we have created is a safe place for interaction as we constantly engage in negotiations to address issues and negotiate tensions among different elements of the systems. From the activity theory, meeting our goals involve resolving contradictions among elements, allowing ourselves to take advantage of an expanded range of actions, including access to a broader repertoire of mediational means, taking turns as lead authors, and developing more efficient ways to work with existing constraints.

A critical aspect of our experience is the rule of Messenger. The activity systems we have created operate within the platform provided by the Messenger app. This is an important contribution of our paper as it highlights the interactions between social media messaging app and activity systems

FIGURE 1
The interrelationships of the factors that contribute to the success of collaborative journal article writing.
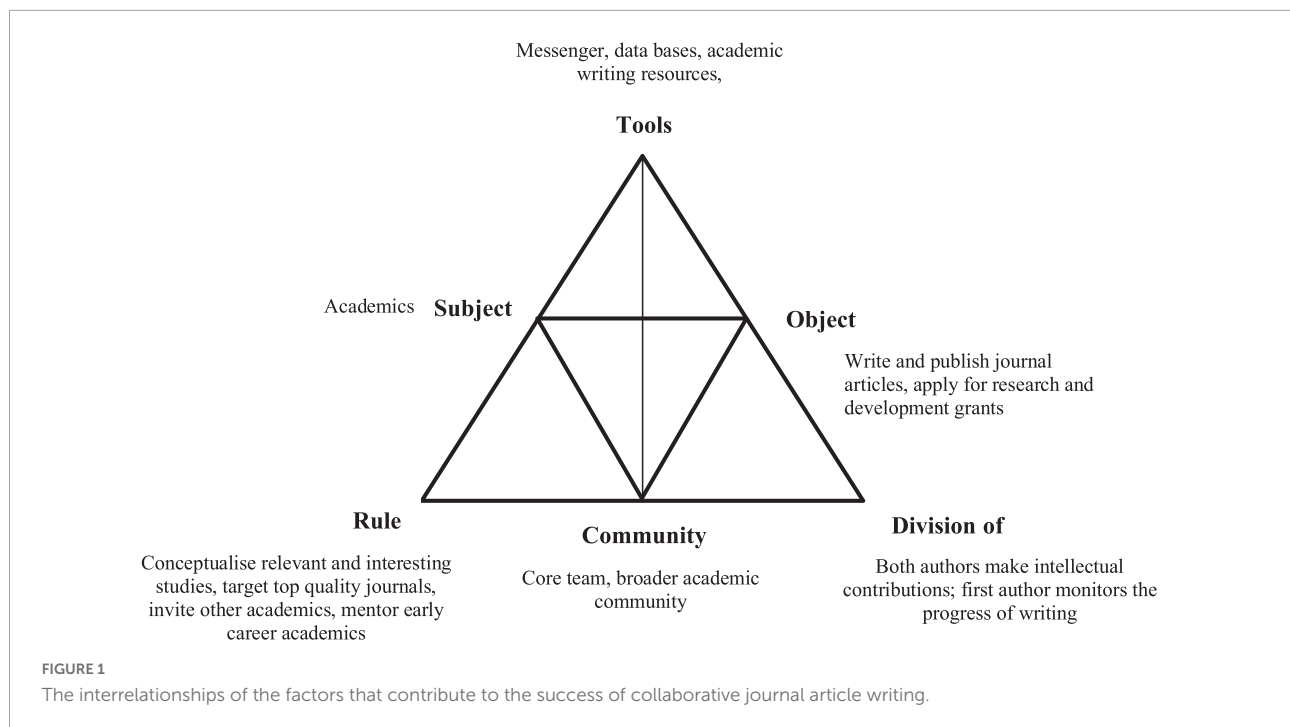
aimed at enhancing our research track record by writing and publishing journal articles and applying for research and development grants. The Messenger serves as the platform for establishing our identity as research collaborators. In our papers, we switch roles in authorship, and whoever is the lead author manages the team.

Overall, using the activity theory to analyse our reflection highlights specific requirements for using Messenger as a collaborative research tool for writing and publishing journal articles. First is the emotional factor particularly motivation and aspiration. This factor is critically important for achieving goals (Osterloh and Frey, 2000). Second, the social factor, including between collaborators and the wider academic network, provides support not only in terms of encouragement but also in providing expert knowledge and critical insights. Third, the personal factor, particularly knowledge and skills, including understanding of the aim of collaboration, specific research knowledge and skills, and leadership and administrative capabilities, provides the expertise required for research activities. Fourth, the structural factor, referring to the tools and rules that facilitate the attainment of our goal, makes the collaboration more cohesive with negotiated expectations. Fifth, the technological factor, using Messenger extensively as a collaborative tool for discussion and negotiation, a repository of recourses and an accessible administrative tool, enhances collaboration and negotiation. Lastly, organisational factor is critical for the success of any collaborative work (Valaitis et al., 2018). Our institutions provided access to databases, working space, and computer

programs for data analysis, referencing, and plagiarism checks.

6. Conclusion

Our paper has demonstrated how a specific social media platform can be used for more focussed research collaboration to increase our publication and secure a research and development grant. We used the activity theory to highlight the interrelationships of factors (i.e., personal, social-emotional, structural, technological, and organisational) contributing to the success of our engagement. The affordances of the Messenger facilitated our collaborative research work by influencing our socially and culturally mediated activities to achieve our pre-identified outcomes.

As we have adopted an auto-ethnographic research design, which is limited only to our collective reflection, research involving a more sophisticated research design is needed to provide more evidence of the intersections of social media and collaborative research work. Also, we used only one specific social media platform. It is worthwhile to explore other social media that might have been used by other academics but are not reported in the literature.

Although our study has limitations in terms of methodology, we have provided an illustrative overview of the role of Messenger in research collaboration. We have demonstrated how this social media platform can be a valuable tool to help support academics engage in writing and publishing journal articles.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

DA: conceptualisation, methodology, data collection, data analysis, and writing – reviewing and editing. CO: conceptualisation, data collection, data analysis, and writing – reviewing. Both authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Exploring the effect of wiki-based writing instruction on writing skills and writing self-efficacy of Chinese English-as-a-foreign language learners

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As a popular Web 2.0 technology, wikis have gained momentum in educational contexts. To give further empirical support to the use of wikis in foreign language education, this research probed the usefulness of a wiki-based writing instruction on the writing skill and self-efficacy of Chinese English-as-a-foreign language (EFL) learners. For this purpose, 53 EFL students in a foreign language school in China were selected as the participants. The two classes were assigned to an experimental group (*N*=25) and a control group (*N*=28). Over a period of 3months, the experimental group was instructed based on wiki-based writing instruction while the control group was taught traditionally. The data were collected by administering IELTS writing tasks and a writing self-efficacy scale employed for pre- and post-tests. The results of data analysis indicated that both classes substantially enhanced their writing skill and writing self-efficacy. Nevertheless, the experimental group performed better than the control group in terms of both dependent variables, leading the researchers to conclude that the wiki-based writing instruction was significantly effective in boosting writing skill and self-efficacy of Chinese EFL learners. These outcomes can offer some worthwhile implications for EFL instructors.

KEYWORDS

web 2.0, IELTS, EFL writing, wiki-based instruction, writing skill, self-efficacy

1. Introduction

Over the past few decades, there has been a widespread integration of internet and digital forms of communication in education and online application tools have become an integral part of teaching and learning (Santos et al., 2019; Huong and Hung, 2021; Liu et al., 2022). In the meantime, numerous Web 2.0 applications have been created which enable learners to generate, recreate, and access information more easily and effectively over the

recent years. In the realm of second language (L2) education, Web 2.0 technological devices can allow learners to interact through L2 exposure and production, promote their attitudes as well as motivation, and use language to co-construct various L2 tasks (Krishnan et al., 2021; Rahimi and Fathi, 2022; Teo et al., 2022), particularly writing (Dizon, 2016; Kazazoglu and Bilir, 2021; Hung and Nguyen, 2022). As an example, Computer-Mediated Communication (CMC), namely emails, online discussion forums, and chats rooms may contribute to L2 learners' meaningful engagement and communication, which in turn, might bring about fruitful language learning and teaching (Lin, 2015). In addition to these tools, more recent applications of the internet, such as blogs and wikis have gained momentum in the English-as-a-foreign language (EFL) contexts (Alharbi, 2015; Reinhardt, 2019), specifically for writing (Zhang et al., 2022).

Consistent with these developments and changes, various researchers have highlighted the significance of blogs or wikis for writing classes and have suggested wikis as a significant tool for collaborative work in the realm of education in general (Chu et al., 2019) and EFL context in particular (Su et al., 2019; Hosseini et al., 2021). Consequently, the adoption of wiki-based writing is coming to the fore in the context of L2 learning (Lai et al., 2016; Hosseini et al., 2020). Recognized as a Web 2.0 technology, wiki is a medium for collaborative writing which helps users to asynchronously compose a text online (Hsu, 2019; Khezrlou, 2022; Van Duong and Aslan, 2022). As Leuf and Cunningham (2001) maintained, wiki is a "freely expandable collection of interlinked web pages, a hypertext system for storing and modifying information – a database, where each page is easily edited by any user with a forms-capable Web browser client" (p. 14). Additionally, Wikis can also be utilized for writing assignments, specifically in blended or distance learning environments in different educational settings (Hudson, 2018). With the use of wikis, learners would be able to perform out-of-class collaborative writing tasks by reviewing and revising a text at any preferred time and place (Zou et al., 2016). Given the significance of wiki-based writing settings in L2 learning process (Su et al., 2019), it is of high importance to investigate this technology and its consequences in language learning and teaching. For instance, wiki-based writing contexts can significantly contribute to learners' outcomes, such as boosting their L2 writing self-confidence (Rahimi and Fathi, 2021), writing proficiency (Li et al., 2014), and collaboration (Li and Zhu, 2017). However, despite the ample empirical evidence in other fields of study (e.g., Wichmann and Rummel, 2013; Lai et al., 2016; Stoddart et al., 2016; Pimlott and Tikasingh, 2021), there still exist a paucity regarding the investigation of wiki-based writing in the realm of Second Language Learning (SLA).

Due to the significance of dynamicity and context-specific nature of L2 learning, individual differences as well as the contextual factors have received more research attention by L2 scholars (Hiver and Al-Hoorie, 2016; Larsen-Freeman, 2016). As writing is a demanding productive skill which needs simultaneous processing of linguistic and affective factors, the role of individual

differences becomes more boldfaced in this skill (Kellogg, 1996). According to Han and Hiver (2018), "psychosocial factors, such as learners' writing specific emotions, self-efficacy and self-regulation, can regulate attention and cognitive engagement, and determine the level of effort learners will invest in the writing process" (p. 44). Consequently, given the critical role of individual and psychological factors in shaping learners' writing (Han and Hiver, 2018), it seems warranted to investigate the potential effects of wiki-based instruction on L2 writing psychological constructs. Overall, in spite of the fact that a number of researchers have examined the effect of wikis on writing development (Li et al., 2014; Stoddart et al., 2016; Hsu, 2019; Rahimi and Fathi, 2021), this research area is still under-explored in EFL settings. More precisely, how wiki collaboration contributes to writing development is not very clear (Storch, 2011). Hence, in order to continue to pursue this line of inquiry to further inform our understanding of the nature and consequences of wiki-based writing instruction and to fill the identified lacuna, the current research examines the impact of wiki-based writing instruction on writing skills and writing self-efficacy of learners in the Chinese EFL context. As such, the two following research questions were formulated for the purpose of this study:

(1) Does wiki-based writing instruction have any significant effect on the writing skills of Chinese EFL learners?
(2) Does wiki-based writing instruction have any significant effect on the writing self-efficacy of Chinese EFL learners?

2. Literature review

2.1. Wiki-based writing

With the advent of Web 2.0 technologies, educational requirements have changed as well, specifically regarding writing process. Extending this into the realm of L2, computer-assisted language learning (CALL) and CMC have become critical tools by which technology can be implemented for the purpose of English writing (Xu and Yu, 2018; Hung et al., 2022). Among the various interactive technologies, wikis are innovative Web 2.0 tools which have been broadly adopted by EFL teachers in order to enhance the writing of their learners (Aydın and Yıldız, 2014; Alghasab et al., 2019). As a CMC open source (Chao and Lo, 2011), wiki is a platform by which users can purposely create and edit the content of web pages (Mak and Coniam, 2008). Wikis are distinguishable from traditional course systems in terms of their features such as open editing and social media tools, therefore, they are likely to improve and promote online collaboration of learners (Leung and Chu, 2009). According to Wang et al. (2011), wiki pertains to "active participation, connectivity, collaboration, and the sharing of knowledge and ideas among users" (p. 216). Despite the fact that it was mainly evolved for the purpose of documenting software patterns (Decker et al., 2007), wiki is

currently being utilized in deferent educational settings to promote writing skills (Wichmann and Rummel, 2013; Pimlott and Tikasingh, 2021). Writing *via* wikis has recently become a focus of particular attention in various fields of study (i.e., EFL) and is now a significant part of many learner programs (Alharbi, 2020). As Wichmann and Rummel (2013) argued in their study, many learners are able to simultaneously collaborate as co-authors by remotely creating and editing the wiki-page in wiki-based writing process. Given the significance of cooperative learning in the context of L2 (Hung, 2019), Wiki platforms permits learners to write, edit and share the content collaboratively, and provides an environment for L2 teachers where they can examine and derive revision patterns from learners' writing and set their writing strategies and instructions based on learners' needs (Chin et al., 2015). Regarding Wikis' user-friendly and learner-centered features, L2 teachers are provided with various opportunities to teach writing with process-oriented approaches (Ng and Lai, 2012). Wiki software has been commonly viewed as the most appropriate Web 2.0 tool to both promote online collaborative writing and pave the way for monitoring the co-authoring process by researchers (Wang, 2015; Jiang and Eslami, 2021; Teng, 2021; Cheung, 2022). According to Li (2011), wiki consists of three modules that are significantly conducive to collaborative writing: Edit allowing learners to write and revise writing texts on wiki pages, History showing all the changes made on the page, i.e., a specific color or deleted and inserted texts, Discussion providing the opportunity by which learners can negotiate writing tasks and meanings through asynchronous communication.

There exists a body of literature examining learners' wiki writing process. For instance, in his study, Zorko (2007) concluded that wiki platforms can facilitate teacher-teacher and student-teacher collaboration, promote learners' motivation, and develop learner autonomy. In another study in Spain, Vurdien (2020) explored how learners used wikis and smartphones to improve their writing skills. Collecting data from a sample of 21 EFL learners, the results indicated that the EFL learners held positive attitudes toward wiki writing and that wiki's collaborative writing promoted the sharing of meaning and knowledge among participants. Gharehbagh et al. (2019) investigated the influences of written corrective feedback using wikis among 14 non-Malaysian ESL students in Kuala Lumpur. Utilizing the sample t-test, their results reported a major improvement regarding learners' language factors such as content, language use, organization, and vocabulary. Additionally, it was indicated that wiki-based writing significantly motivated L2 learners in terms of learning English. Liou and Lee (2011) compared learners' collaboratively and individually produced texts in wiki platform. To this end, 18 EFL students took part in this study. Their findings suggested that wiki-based collaborative writing can provide an environment in which learners are able to learn from each other. The results also revealed that EFL learners believed that collaborative activities can improve their writing performance. In another study in the United States, Elabdali (2016) examined the wiki-based collaborative writing in an L2 classroom.

Gathering data from a number of 9 ESL learners, the authors reported that learners held the belief that creative writing tasks, particularly wikis contributed to their sense of agency and authenticity. Similarly, Hosseini et al. (2021) carried out a study on 72 EFL learners from a language institute in order to first, investigate the impact of wikis as a collaborative tool on learners' writing fluency and second, to investigate their perceptions of using wikis. Administering a post-task attitude questionnaire entailing and four open-ended questions to the participants, the findings suggested that wiki tools significantly improved their writing fluency. Also, it was found that EFL students held positive attitudes toward the integration of wikis.

A review of the existing literature indicates that although the wiki-based writing has attracted much attention in various contexts like EFL (e.g., Chu et al., 2019; Ma, 2020; Vurdien, 2020; Rahimi and Fathi, 2021; Khezrlou, 2022), empirical evidence on its effects and consequences on L2 psychological factors and writing literacy is still fairly limited. Hence, as an attempt to bridge the identified gap in the literature, the present study sought to investigate the contributions of wiki-based writing instruction to EFL learners' psychological and writing resources such as writing competency and self-efficacy. In another words, we investigated the effect of learners' wiki-based writing instruction on their writing skills and writing self-efficacy in the EFL context.

2.2. Self-efficacy

As Bandura (1986) noted, self-efficacy is commonly viewed as one's belief or judgment regarding his/her own capabilities in order to perform a particular task or action. The higher an individual's level of self-efficacy, the more that individual is confident that he/she is able to complete a particular action at a specific level. Self-efficacy is rooted in Bandura's (1977) social cognitive theory and Rotter's (1966) locus of control theory, and is a multidimensional and domain-specific construct (Sezgintürk and Sungur, 2020). It is argued that self-efficacy is the basis of individuals' motivation, in fact, without a person's judgment of his own ability to effectively complete a task; it is not easy to motivate people to undertake it (Sezgintürk and Sungur, 2020). Extending this into education, self-efficacy pertains to learners' belief about their own capacities and capabilities to achieve a particular educational objective or outcome, (e.g., learners' capabilities to do well on a test or get desired grades in school Olivier et al., 2019). Zimmerman (2000) maintained that learners' self-efficacy can play a predictive role in affecting their motivation to learn, their performance, effort, persistence, and emotional reactions to setbacks during learning. Furthermore, Bandura (1989) noted that there is a strong and positive relationship between student's self-efficacy and the amount of effort they exert, which in turn, can lead to their higher academic achievements regardless of actual capability. In their study, Huang and Mayer (2019) concluded that learners' self-efficacy exerted a strong influence on their achievement in an online course. In fact, it is apparent that

self-efficacy and students' academic achievement and desired outcomes are positively and significantly correlated (Hayat et al., 2020; Tus, 2020).

Since self-efficacy is context-dependent (Bandura, 1986), online self-efficacy can be viewed as a warranted and worthwhile construct which is concerned with learners' beliefs in their competence in employing technology, online learning, and sustaining social interaction in online educational contexts (Tezer et al., 2018; Uzunboylu et al., 2020). As Stephen et al. (2020) suggested, self-efficacy plays a pivotal role in the development of learners' online persistence by which they are able to focus on their nontraditional, online needs, skills, and characteristics.

2.3. Writing self-efficacy

As mentioned earlier, self-efficacy is a domain-specific construct (Bandura, 2006), meaning that self-efficacy measures are in essence specific within one area of knowledge but not others. As Pajares and Valiante (2006) indicated, measures of self-efficacy must include "an understanding of both the domain under investigation and its different features, as well as of the types of capabilities the domain requires and the range of situations in which these capabilities might be applied" (p. 162). Therefore, as one can argue, this view highlights the value of framing writing self-efficacy in a way that can reflect learners' confidence regarding effectively meeting their psychological, linguistic, and behavioral challenges during the writing process (Bruning et al., 2013; Yilmaz Soylu et al., 2017). First coined by Pajares (2003), writing self-efficacy can effectively control a writer's thoughts, feelings, and actions (Hetthong and Teo, 2013). As a context specific construct (Chea and Shumow, 2017), writing self-efficacy is referred to as learners' beliefs about their abilities and capacities to effectively write a text (Schunk and Swartz, 1993; Woodrow, 2011; Sun et al., 2021). As affected by both learners' physiological and emotional reactions to an activity and their past experience and verbal feedback from peers (Bandura, 1986), writing self-efficacy can be conducive to learners' desired writing performance (Golparvar and Khafi, 2021). As Bruning et al. (2013) suggested, writing self-efficacy consists of three dimensions: Ideation, as the first step of the writing task, refers to learner's capability to create ideas, Convention referring to learner's capability to convey the created ideas *via* linguistics skills, and Self-regulation pertaining to learners' self-management and control of their own thoughts, feelings, and actions and also to learners' perception about their cognitive and linguistic capacities while writing a text. EFL learners' confidence in English writing can not only reflect their attitudes toward writing but it also can indicate learners' likelihood to master or avoid the writing process (Zhang and Guo, 2012). As Hetthong and Teo (2013) suggested in their study, if EFL learners are confident enough to complete a writing task, regardless of the fact that whether they are competent or not, they are more inclined to invest effort in coping with setbacks and difficulties while writing a text. Moreover, a growing number of studies have

highlighted the fact that EFL students who believed in their abilities to use their capacities and regulate their actions while writing, in return were more likely to invest effort in the writing process and seize the writing opportunities (e.g., Kim et al., 2015). For instance, Sun and Wang (2020) carried out a study to investigate the association between writing self-efficacy and writing self-regulated learning strategies and writing proficiency of EFL learners. To do so, two different questionnaires were administered to a sample of 319 EFL students in the context of China. Employing confirmatory factor analysis, their results demonstrated that both writing self-efficacy and writing self-regulated learning strategies positively and significantly predicted EFL learners' writing proficiency. In another study in China, Woodrow (2011) explored the association between learners' writing self-efficacy and writing performance. Collecting data from a sample of 738 EFL learners, the findings indicated that there was a strong and positive relationship between writing self-efficacy and writing performance of learners. In addition, it was revealed that writing self-efficacy negatively related with learners' anxiety.

It is worth noting that few if any studies have focused solely on the relationship between writing self-efficacy and wiki-based instruction, however, writing self-efficacy is argued to be promoted by other online tools and platforms. For example, Alberth (2019) investigated the influence of a social media (i.e., Facebook) on learners' writing performance and writing self-efficacy among 64 EFL students. The results demonstrated that Facebook not only improved the EFL learners' writing performance but also promoted their writing self-efficacy. In a study, Rahimi and Fathi (2021) conducted a sequential explanatory mixed-methods study to examine the influence of wiki-mediated collaborative writing on EFL learners' writing performance, writing self-regulation, and writing self-efficacy. To this end, 67 Iranian EFL students took part in this study. The results of the quantitative data revealed that both wiki-mediated and non-wiki collaborative writing instructions promoted EFL learners' writing performance, writing self-regulation, and writing self-efficacy. Additionally, in terms of the qualitative data, it was indicated that writing mediations positively predicted EFL learners' writing proficiency in the wiki platform. In the similar vein, Fathi et al. (2019) examined the impacts of a blog-mediated writing course on learners' writing motivation, self-efficacy, and self-regulation. To this aim, the authors collected data from a sample of 46 Iranian EFL students. Employing an explanatory sequential design, their results indicated that Blog-Mediated Writing Instruction significantly contributed to writing motivation and writing self-regulation of EFL learners. Nevertheless, it was found that the blog-mediated writing course decreased EFL students' writing self-efficacy.

2.4. Wiki-based writing instruction and writing skills

A mounting number of studies have delved into the effectiveness of wiki-based writing on writing skills of learners

(e.g., Chao and Lo, 2011; Sun and Qiu, 2014; Hsu, 2019; Vurdien, 2020; Rahimi and Fathi, 2021; Khezrlou, 2022). For instance, Li et al. (2014) examined the impacts of wiki-based collaborative writing on writing ability and writing perceptions of learners. Their findings demonstrated that wikis positively affected learners' writing ability. In another study, Pae (2007) explored the association between wiki-based English writing classes and learners' writing proficiency and anxiety among 15 EFL students. The findings revealed that the wiki-based instruction had a positive effect on learners' writing proficiency but had insignificant impact on their writing anxiety. In Brazil, Franco (2008) probed the effect of wiki-based tools on learners' writing skills. Administering a survey to sample of 18 EFL learners, the results reported a predictive role of wikis in developing learners' writing skills. In another study, in Iran, Akbari and Erfani (2018) investigated the impacts of wikis on writing skill of EFL learners. The results of statistical analysis indicated that utilizing wikis was associated with higher levels of writing skills among participants. In the same vein, Kioumarsi et al. (2018) investigated the influences of wikis and wiki-based process writing instruction on EFL learners' writing abilities. To do so, 16 Iranian EFL students took part in this research. The findings indicated that wiki-based instruction significantly contributed to EFL learners' writing skills and promoted their motivation and autonomy in writing.

The aforementioned literature highlights the critical role that wiki tools play in the process of learners' writing skills. Although there is a growing body of literature that deals with wikis in the L2 context, there has been a scarcity of research on its association with learners' writing proficiency and skills in the context of EFL. In addition, no other study, so far, has attended simultaneously to the associations between wiki tools and EFL learners' writing self-efficacy and writing skills. Hence, as an attempt to fill that void, the present study delves into the effects of wiki-based instruction on learners' writing self-efficacy and writing skills in the context of EFL.

3. Materials and methods

3.1. Participants

This was a quasi-experimental study in which two intact groups (53 students in total) were employed as the participants. In total, 53 Chinese EFL students took part in this study. These participants were students of two classes from a foreign language school in Zhejiang Province of China. Given the criteria of availability and willingness to participate, convenience sampling was used to select these EFL students who included male and female students. The two classes were assigned to an experimental group ($N = 25$) and a control group ($N = 28$). Participants' age ranged from 18 to 23 ($M = 22.36$, SD $= 3.27$) and they reported that they had the experience of learning English from 7 to 15 years ($M = 9.02$, SD $= 2.89$). This language school was preparing EFL students to take IELTS and whose purpose was to elevate the language competencies of the students in the four skills.

In this course, the students had enrolled in the writing skill course with duration of 3 months, 2 h per week. The two groups were taught by a trained IELTS teacher who was also familiar with wikis.

3.2. Instruments

3.2.1. English proficiency test

In order to investigate whether the EFL students were not substantially different in terms of global English proficiency, Oxford Placement Test (OPT) was administered to two groups. This test is considered as an appropriate test of proficiency which can gage English abilities of various students with differing levels (Allan, 2004). To compare the two groups in terms of English proficiency, their average scores were compared *via* performing an independent samples *t*-test. The result revealed that there no substantial difference existed between them, verifying their homogeneity before starting the intervention. The Cronbach's alpha reliability of the test was 0.87 in this research.

3.2.2. Writing performance test

EFL learners' writing skill was assessed using sample IELTS tasks selected from 'Collins writing for IELTS' (Williams, 2011). To this end, two sample tasks were administered as pre- and post-tests. The content validity of the two sample tasks was checked carefully by two domain experts specializing in L2 writing research in terms of content and suitability. In other words, the experts evaluated how well the tasks could measure the writing skill of the participants. As for scoring the written tasks, IELTS academic writing rubric (University of Cambridge ESOL Examinations, 2011) was used. The written tasks were rated by another writing expert who had the experience of using IELTS writing rubric. The inter-rater reliability coefficient as measured by Cohen's Kappa turned out to be 0.84.

3.2.3. Writing self-efficacy scale

Participants' self-efficacy in doing writing tasks was measured using a 9-item self-report scale developed by Han and Hiver (2018). This scale aims to assess the respondents' perceived confidence in doing written English tasks particularly in terms of organization, content, grammar as well as format, vocabulary, and sentence structure. The domain experts were again consulted to judge the content validity of this scale by checking the items and they agreed that this self-report scale could be used for measuring writing self-efficacy of the participants. This scale was administered twice as pre- and post-test. The reliability coefficients of this scale, as estimated by Cronbach's Alpha formula, were 0.82 and 0.85 in the pre- and post-tests, respectively.

3.3. Operationalization of the independent variable

Wiki-based instruction was use for doing the EFL collaborative writing tasks in the experimental group. Initially, the

instructor gave the learners a general discussion on how to employ wiki for doing writing tasks collaboratively. He explained the features of wiki including achieving, revising, and commenting in the forum. The participants of the experimental group were divided in groups of three or four individuals in order to construct their own wikis for doing writing tasks. These students were requested to do writing tasks together outside the class by giving feedback to each other on various aspects of writing in terms of language, content, and organization *via* wiki collaborative discussions. They were also asked to do a written task (e.g., to write about a topic) each session. There was a warm-up stage for each task prior to using wiki pages in order to activate the background knowledge of the participants. The instructor ensured that participants have sufficiently participated in group discussions and collaborative writing by monitoring wiki discussions and activities. In addition, tried to encourage the less active participants to become more actively involved in the wiki activities. The teacher also aided the students in providing more constructive and peer mediations on different aspects of writing.

On the contrary, the participants of the control group were requested to do similar writing tasks collaboratively but without the use of wikis or any other technology devices. In fact, all the procedures, content, and tasks of the two groups were the same except for the fact that the collaborative writing tasks were not wiki-mediated. These students were also required to give peer-feedback to each other with regard to different aspects of writing organization, language use, and content. There was a schema activation phase like that of the experimental group in which the students were involved in brainstorming about the topic. Like the wiki group, the students of the control group were also divided in groups of three or four. The teacher also checked the group activities and peer mediations of the participants.

3.4. Data collection

In the first session of the course (week 1), the instructor provided the students with a general discussion of the purpose of the course. Then the pre-tests including the sample IELTS task 1 and writing self-efficacy scale was administered to the students of both groups. At the end of the treatment which lasted for about 13 weeks, the post-tests were given to the participants. More specifically, the last session (week 13) was devoted to students' completing the writing self-efficacy scale and doing the sample IELTS task 2.

3.5. Data analysis

The data analysis was carried out using IBM SPSS program (version 23). To address the research questions of this research, both descriptive and inferential statistics were utilized. With regard to the descriptive statistics, mean, standard deviation, skewness, kurtosis, and reliability coefficients were calculated.

Concerning the inferential statistics, one-way analysis of covariance (ANCOVA) was used for each research question. In each ANCOVA analysis, the pre-test scores were a covariate, the post-test scores were considered as the dependent variables, and the instruction type with two levels (i.e., wiki-based or conventional) was the independent variable.

4. Results

Before calculating the descriptive statistics and performing ANCOVAs, some pre-requisite assumptions were checked. With regard to checking the normality of the data, skewedness and kurtosis values were taken into account. More specifically, the ratios of skewedness and kurtosis statistics to the standard errors were referred to.

As seen in Table 1, the ratios lay within the range from −1.96 to +1.96, confirming that the data were normally distributed. As required by ANCOVA analyzes, some other preliminary checks were made to ensure that the assumptions were all met and not violated. More particularly, the other assumptions of linearity, homogeneity of variances, homogeneity of regression slopes, and reliable estimation of the covariate were all investigated. These investigations revealed that none of the assumptions were violated, confirming that the ANCOVAs could be run.

As for the first research question which was concerned with exploring the impact of wiki-based writing course on EFL writing skill, as Table 2 displays, the writing mean score of the wiki group increased from 55.84 (SD = 8.99) to 88.92 (SD = 10.87) on the post-test. In the same vein, the mean score of writing skill for the control group rose from 56.53 (SD = 9.42) to 66.67 (SD = 9.97) on the post-test. Nevertheless, after adjusting for the covariate (writing pre-test scores), a significant difference was observed between the groups in terms of writing skill, F (1, 50) = 59.51, ($p < 0.001$, partial eta squared = 0.54; see Table 3). This outcome shows that the students of the wiki group enhanced their writing skill substantially greater than the those in the control group, verifying that the use of wikis in the writing instruction substantially enhanced the writing skill of the participants.

Research question 2 was set to explore the effect of wiki-based instruction on the writing self-efficacy of Chinese EFL learners, As seen in Table 2, the descriptive statistics data illustrate that the mean score of the experimental group on the writing self-efficacy score was 20.46 (SD = 4.65) in the pre-test and this value was

TABLE 1 Testing the normality of the data.

	N	Skewedness (Std. Error)	Kurtosis (Std. Error)
Writing 1	53	0.327 (0.293)	−0.337 (0.622)
Writing 2	53	−0.304 (0.301)	−1.21 (0.634)
Self-efficacy 1	53	−0.439 (0.303)	−0.118 (0.627)
Self-efficacy 2	53	−0.412 (0.299)	−0.375 (0.616)

raised to 30.38 (SD = 7.45) on the post-test. Likewise, the mean score of writing self-efficacy for the control group was raised from 20.10 (SD = 4.28) on the pre-test to 22.80 (SD = 4.90) on the post-test. After adjusting the covariate (i.e., self-efficacy scores), ANCOVA results (see Table 4) showed that a significant difference existed between the two groups in terms of writing self-efficacy, F (1, 50) = 23.11, ($p < 0.001$, partial eta squared = 0.31). This result highlighted the fact that the use of wikis in the writing instruction significantly contributed to improving the writing self-efficacy of Chinese EFL students.

5. Discussion

The current research aimed to investigate the effect of wiki-based writing instruction on the writing skills and writing self-efficacy of Chinese EFL learners. Regarding the purposes of the current research and the formulated research questions, the results of the ANCOVAs by comparing the two dependent variables (i.e., writing skills and writing self-efficacy) between two study groups on the posttest scores after controlling for the pretest scores yielded two notable findings.

First, the investigation of research question one revealed that the use of wiki-based writing improved writing performance of EFL learners. This result is in accordance with previous research on the usefulness of wikis in affecting learners' writing skills (e.g., Li et al., 2014; Akbari and Erfani, 2018; Khezrlou, 2022; Van Duong and Aslan, 2022). In addition, this finding supports Hsu's (2019) study which demonstrated that wiki collaborative Pae writing positively improved learners' writing performance. As one can argue, wiki-mediated collaborative writing can significantly promote writing skills of EFL learners. Following what Ma (2020) demonstrated in his study, learners using online wiki platforms are more likely to effectively peer correct and give feedback on the writing activities and contribute to their writing performance. Therefore, one possible explanation or this finding might be in light of the fact that due to the learner-centered feature of the wiki space, EFL learners might be provided with the opportunity to conveniently and collaboratively monitor and enhance their peers' writing proficiency. These results are in agreement with the empirical research of Liou and Lee (2011) who reported that wiki-based collaborative writing tasks can provide convenient environments in which students can learn from each other, which in turn, may lead to their enhanced writing. Furthermore, the findings can be justified in the light of the study of Zorko (2007) who points out that wiki-based instruction may contribute to learners' autonomy as they can be in control of their own learning and construct their own knowledge independently, which eventually, might promote their writing skills.

Second, the results of the data analysis for examining the second research question indicated that the use of wiki-based writing improved writing self-efficacy of Chinese EFL learners. The outcomes of this study are in line with the study by Rahimi and Fathi (2021) who suggested that wikis can significantly enhance the writing self-efficacy of EFL learners. The results partially corroborate the ideas of Alberth (2019) who reported that online application tools had positive effects on facilitating learners' writing self-efficacy. In addition, the findings are partially in line with those of Xu et al. (2011) who demonstrated that online

TABLE 2 Descriptive statistics for pre- and post-tests scores.

	Group	N	Mean	Std. Deviation	Std. Error mean
Pre writing	Experimental	25	55.84	8.99	1.79
	Control	28	56.53	9.42	1.78
Post writing	Experimental	25	88.92	10.87	2.17
	Control	28	66.67	9.97	1.88
Pre efficacy	Experimental	25	20.46	4.65	0.93
	Control	28	20.1	4.28	0.62
Post efficacy	Experimental	25	30.38	7.45	1.49
	Control	28	22.8036	4.9	0.73

TABLE 3 The results of ANCOVA on writing skill.

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Covariate (pre-test)	74.987	1	74.987	0.689	0.41	0.014
Between-subjects	6470.38	1	6470.38	59.416	0	0.543
Within-subjects	5444.96	50	108.899			

TABLE 4 The results of ANCOVA on writing self-efficacy.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Covariate (pre-test)	179.401	1	179.401	5.73	0.02	0.103
Between-subjects	723.829	1	723.829	23.119	0	0.316
Within-subjects	1565.409	50	31.308			

environments, in which learners have no limitations of time and space, may boost students' writing self-efficacy. A possible explanation seems valid in this regard: since learners use wiki tools for their writing tasks, they can collaborate and share ideas with other learners using wikis and find solutions for problems or be resistance in the face of difficulties while writing a text, and since solving problems and being resistance when facing setbacks is correlated with higher self-efficacy (Garza et al., 2014); therefore, it can be conjectured that wiki tools can contribute to learners' self-efficacy. Furthermore, following Bandura (1977), given the fact that students can write collaboratively in a comfortably and friendly online environment without any specific limitations which may promote their writing self-efficacy, we postulate that wiki-based instructions can increase learners' positive attitudes and perceptions regarding their writing skills and performance. Another rationale behind this prediction might be that while using wikis, learners can receive positive feedbacks from peers which in turn can enhance writing self-efficacy as feedbacks are positively associated with learners' self-efficacy (Wang and Wu, 2008). As such, EFL learners receiving positive feedback from other peers while writing can experience higher levels of writing self-efficacy (Rahimi and Fathi, 2021). However, this finding is partially in contrast with those of Fathi et al. (2019) who noted that blog-mediated writing course decreased learners' self-efficacy.

6. Conclusions and implications

To lend further support to the importance of online application tools and Web 2.0 in EFL contexts, this study sought to investigate the effect of wiki-based instruction on the writing skills and writing self-efficacy of Chinese EFL learners. As demonstrated by the results, the current study indicated that wiki was an effective Web 2.0 tool for promoting and improving writing skills and writing self-efficacy of the EFL learners. The current research was the first attempt to probe the simultaneous relationships among the constructs of wiki-based instruction, writing skills, and writing self-efficacy of EFL students. Given the fact that wiki tools have a significant role in affecting writing self-efficacy and writing performance, EFL teachers and methodologists should consider wiki-based instruction intervention programs in order to facilitate EFL learners' integration of wiki tools. The outcomes of the study can also offer some implications to policy makers and EFL teacher educators so that they can create more appropriate conditions for EFL instructors to design an effective online wiki context for EFL learners. Training teachers to use wikis more effectively will help their students to carry out writing collaboratively and successfully.

In the same vein, further initiatives should be taken to enhance EFL learners' writing self-efficacy and writing abilities by paying particular attention to utilizing effective strategies and approaches to promote their beliefs of competence in writing tasks

and their abilities to practically write texts. Despite the fact that the results generated valuable insights into the benefits of implementing wiki tools in EFL learning context, the findings complete just a small piece of a complex puzzle and therefore further research is needed to contribute to a better understanding and some ambiguity about the nature, features, dimensionality, and consequences of integration of Web 2.0 tools, specifically wikis in the realm of EFL learning and teaching. In addition, it is apparent that self-efficacy plays an integral role in L2 learning (Goetze and Driver, 2022), since it can significantly contribute to different skills of EFL students, particularly their writing (Bai and Guo, 2018). Hence, L2 officials and policy makers should make an attempt to bolster the self-efficacy of EFL learners in classrooms for a fruitful English learning.

Concerning the limitations of this research, it is worth noting that we utilized just a quantitative research method. Therefore, next researchers are invited to triangulate their findings with adding qualitative or mixed-methods research designs to shed more light on the utility of wikis in EFL writing courses. Also, the external validity of the results will be enhanced if the future researchers replicate studies by recruiting larger samples of participants with various proficiency levels in EFL contexts other than China. Given the potential effectiveness of wikis, future researchers are encouraged to explore the effects of wikis on other EFL skills and components.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by Wenzhou Medical University Academic Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Using social media for assessment purposes: Practices and future directions

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The use of social media across the world is rapidly increasing, and schools are advancing its use for learning, teaching, and assessment activities. Despite growing evidence for their accessibility and affordances for educational purposes, very little attention has been paid to their use in assessment. Using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA), this paper is an initial step to explore how social media have been used and reported in the literature, and describe some key challenges. A total of 167 articles were initially accessed from three databases, but only 17 were relevant after applying the exclusion criteria. Results show that the most dominant social media used in assessment are Facebook and Twitter. Also, the assessment practices are limited to sending and discussing assessment tasks, following up on progress, giving feedback, and engaging in self and peer assessment. Key issues include the trustworthiness of the assessment process and outputs, limited features of social media platforms, technical support, time commitment between teachers and students, and intersections of social and academic engagements. We discuss the implications of these findings with the critical gaps in the theorisation of using social media for assessment purposes.

KEYWORDS

social media, assessment, schools, learning, teaching

1. Introduction

Social media are used for various purposes, including communicating, sharing information, creating content, dating, and many others (Alalwan, 2022). Statista (2021) predicts that social media users will rise to 4.41 billion people worldwide by 2025. In educational contexts, schools are also advancing their use for learning, teaching, and assessment activities. Social media have become highly interactive platforms where students can share and discuss their ideas and information (Ashraf et al., 2021; Mahmud et al., 2022). Using social media in learning and teaching, including facilitating interactions between teachers and students and among students, is not

geographically limited or time-bound (Akgül and Uymaz, 2022). Thus, providing a mechanism for continuous transfer and co-construction of knowledge together. In addition, social media use facilitates synchronous and asynchronous interactions with many additional features, including links and resource sharing, and voice messaging (Ashraf et al., 2021). Moreover, the learning platform in social media facilitates parents to monitor their children's progress as they can access their work. Hence, it creates a more significant interaction for students, teachers, and parents/careers. In addition, by engaging in social media learning, students also create an opportunity to interact with people worldwide (Espinoza-Celi and Pintado, 2020). Other people become resources that can provide critical insights to their learning. As such, social media have become the most favored alternative platforms for educational systems that cannot subscribe to learning management systems (Al-Rahmi et al., 2022).

While this evidence highlights the use of social media for learning and teaching, there are only a few reports on how social media are used for assessment purposes. It has been shown that social media can facilitate the provision of immediate feedback (e.g., Annamalai and Jaganathan, 2017; Nuray, 2019). Teachers could respond as soon as students uploaded their work (Liu and Ko, 2020). Through this immediate feedback, students could monitor their learning progress and how they are meeting the learning outcomes (Espinoza-Celi and Pintado, 2020). In addition, the use of social media can facilitate peer assessment. Students can comment on each other's posts, identifying their strengths and providing suggestions to further improve their peer's work. This process increases students' motivation and confidence in learning (Vikneswaran and Krish, 2016; Lai et al., 2020). There is also evidence that social media have been used to administer pre- and post-tests to measure students' learning gains (e.g., Huang et al., 2014; Yuk and Yunus, 2021). Collectively, these few research articles provide evidence for social media use as alternative platforms for implementing assessment. However, it is quite limited with only few assessment strategies used. It is also unclear from the literature the intersections between assessment and social media use. Given that assessment plays a central role in improving learning and teaching (Assessment Reform Group, 2002; Black and Wiliam, 2018), and social media are gaining prominence as alternative platforms in learning and teaching, it is worthwhile exploring the use of social media for assessment purposes. Thus, we provide an initial step to scope how social media have been used in assessing students and the issues associated with their use in primary and secondary school contexts. We aim to identify critical gaps in the literature and provide future research directions. The following research questions guide this paper:

1. What are the main characteristics (e.g., study location, school level, and research design) of included studies reporting social media used in assessment?
2. What and how have social media been used for assessment?
3. What are the issues with using social media in assessment?

2. Literature review

We provide a brief review of the literature to provide evidence of using social media in learning, teaching and assessment activities.

2.1. Assessment in education

Assessment plays a central role in ensuring effectiveness of learning and teaching (Black and Wiliam, 2018). Theoretical and empirical evidence support the claim that assessment is collectively the most important intervention in the classroom with the highest effect size on increasing student outcomes (Hattie, 2009). However, despite this widely shared view, assessment processes and practices have long been debated in educational research (Bloom et al., 1971; Ramaprasad, 1983; Baird et al., 2017), with dichotomies emerging between summative (SA) and formative assessments (FA). The common understanding is that FA is routinely carried out to gather data to inform pedagogy (Bennett, 2011) and SA is used to evaluate whether learning has occurred (Lau, 2016). To address this issue, the Assessment Reform Group (2002) proposed the concept of Assessment *for* Learning (A*f*L) and defined it as "a process of seeking and interpreting evidence to identify where learners are, where they need to go, and how best to go there" (Assessment Reform Group, 2002, p. 2). This definition encompasses all assessment strategies used in the classrooms, including FA and SA, which the results are used to inform learning and teaching activities. Building on this definition, Davison (2007) offered a continuum of assessment practices from in-class contingent FA, planned formative assessment, mock SA, to the most formal SA, including high stake testing and international examinations whose results are used to support individual students. More recently, Black and Wiliam (2018) explicitly argued that that the dichotomy between FA and SA becomes irrelevant when assessments are conceptualized within a broader pedagogical model.

To optimize the impact of assessment on student learning, regardless of types, they should be an integral part of learning and teaching, and the results are used to identify learning needs of, and support needed by individual students. The design, implementation, and participation of students in the assessment process are critical for its effectiveness. There is a growing consensus in education that teaching, learning and assessing should aim to foster and develop students to actively engage, participate, contribute to, reflect on and evaluate their learning approaches and outcomes (Hannigan et al., 2022). Moreover, the social interactions and the dialogic nature of assessment (Ruiz-Primo, 2011), particularly eliciting and giving feedback, as conceptualized from a Vygotskian perspective, calls for student agency in the learning space and the necessity of knowledge exchange, regardless of the type of assessment in use. As such, exploring how social media can be used as alternative platforms for assessment purposes, in an ever changing and increasingly

dynamic educational landscape is important as educators seek to engage students in increasingly innovative and responsive ways, and create opportunities for students to demonstrate their learning.

2.2. Online assessment

The number of online resources available for learning and teaching has increased because of the advancement of information and communication technology (Özden et al., 2004). Subsequently, the use of online learning has increased dramatically, creating additional opportunities for interaction among students, students and teachers, and teachers themselves (Singh and Thurman, 2019). In comparison to traditional classroom settings, learning practices have changed as a result of the growth of online learning, allowing higher interactions among students and opportunities for students to adopt a more flexible approach (Robles and Braathen, 2002).

Moving classes from a traditional classroom setting to an online setting means that learning practices has fundamentally been shifted, including assessment techniques (Robles and Braathen, 2002). For example, the development of e-learning influences the broader opportunities for innovation in assessment beyond the limitation of the traditional paper-based test (Scalise and Gifford, 2006). In addition, within an online course, learning activities and assessment are very closely connected since teachers needs to carefully articulate the desired learning objectives and how those objectives are measured through an online assessment approach (Sewell et al., 2010). Moreover, the practice of online assessment depends greatly on teachers' competencies since it requires technical skills in scoring and providing real-time feedback for students (Olufisoye and Ola, 2013). The practice of online assessment is fundamentally dominated by summative assessment, measuring the overall learning achievement of students (Guangul et al., 2020). Herein, most online assessment platforms are built for one-way interaction where students are presented with assessment tasks and respond to it accordingly (Schultz and Callahan, 2022). These platforms do not allow for more meaningful assessment practices that mimic the classroom environment where teachers can implement assessment as an integral part of learning and teaching processes (Black and Wiliam, 2018).

Thus, social media can be viewed as an alternative platform for administering educational assessment. It has some distinctive features when compared with online assessment platforms. Social media also offers the opportunity for students to receive timely feedback from fellow classmates (Kio, 2015). Social media is primarily formative in nature and offers a more dialogic and interactive feedback as well as prompt responses from teachers, whereas online assessments are primarily delivering a one-way approach (teacher to student). In addition, the barriers of delayed responses from the assessment are diminished in social media platforms since student can ask questions any time, and the teacher can provide an immediate response to students' question.

2.3. Social media in education

Social media have become an integral platform for learning and teaching that helps students share ideas, bridge communication gaps, and browse information (Mahmud et al., 2022). Giroux and Moreau (2022) demonstrate teachers' use of social media to engage students both in structured and unstructured learning. In structured learning, they include watching YouTube videos in the classroom and using the content for further discussion. Unstructured learning activities using social media include finding relevant learning content as informal learning. Herein, evidence indicates that students use social media to communicate and fulfill their educational needs (Salih and Elsaid, 2018). For example, students use social media to improve their writing skills by posting their draft and receiving feedback from their peers and teacher (Haidari et al., 2020).

Different types of social media have been used in teaching, including Twitter, WhatsApp, Instagram, YouTube, and Snapchat (Alenezi and Brinthaupt, 2022; Noori et al., 2022). Research indicates that students have specific preference for the type of social media they use to support their learning (Ma et al., 2021). Facebook, including Messenger, is the widely preferred communication tool among students (Maulina Geelan et al., 2021), and students use it to communicate, share ideas, and discuss their assignments (Donlan, 2014). On the other hand, even though Instagram has not received much attention for learning and teaching, some teachers use it to engage students in learning activities (Handayani, 2015). In the study of Mahmud et al. (2022), classroom teachers asked students to post Instagram stories about their reading activities, including photos of their favorite books and a short book review. Their study reveals that this activity increased student motivation to read and learn. WhatsApp has also been used as a collaborative tool for sharing learning materials with students (Mangundu, 2022), and interacting with students beyond the classroom setting (Maulina Geelan et al., 2021).

The collaboration and engagement among students and teachers *via* social media have enhanced opportunities to share ideas and discuss them (Pujiati et al., 2019; Ansari and Khan, 2020; Alenezi and Brinthaupt, 2022). Teachers use social media to assign group posts in the course (Lai et al., 2021), where students then create groups on social media sites to engage in discussion, regardless of their physical presence. Students in the study of Donlan (2014) reported on the benefits of said social media usage in that they "can constantly communicate with each other like send links out, send photos, all the research we find. So, we all get it and all share it rather than texting someone or trying to email so we are all included in the same thing (p. 583)."

2.4. The use of social media for assessment purposes

Previous research highlighted using social media for assessment purposes to support students' learning. The use of social media in assessment can cultivate increasingly creative and enjoyable learning opportunities for students. Teachers use social media as a platform for students to discuss and submit their outputs (Mahmud et al., 2022). In addition, teachers use social media sites to assess student outcomes (Alabdulkareem, 2015), particularly by providing timely feedback (Giroux and Moreau, 2022). The interactivity of social media serves as a platform for students to clarify feedback (Alfahadi, 2017). Students can interact with their teachers to seek clarifications on the content of feedback and ask for suggestions on how to act on them. Lai et al. (2021) used social media to assign various tasks in the course and utilize various opportunities for students to engage in classroom activities. They have found out that the use of social media for learning and assessment purposes provide students greater sense of participation and ownership.

Specific social media have been used in assessment. For example, Facebook is used to enhance students' vocabulary. The interactivity, provision of immediate feedback, and availability of online resources facilitate students' learning and use of new words (Mukhlif and Challob, 2021). In addition, Facebook is used to improve students' reflective writing (Annamalai and Jaganathan, 2017). Students engage in peer assessment providing feedback to their peers. Twitter is used to develop students' writing skills by learning sophisticated vocabulary, expressions, idioms, and grammar structures (Espinoza-Celi and Pintado, 2020). Edmodo is used to develop the writing competence of primary school students at the pre-writing and drafting stage of writing (Yuk and Yunus, 2021).

While there is evidence for the use of social media for assessment purposes, there are reported issues related to its uptake and teachers' and students' beliefs and actual use. For example, in the study of Donlan (2014), Facebook was used for communication and assessment. However, the uptake is relatively low due to the perceived use of Facebook for personal space, and not for assessment purposes. There was a mismatch between the potential use of Facebook and students' attitude. This is corroborated by the study of Alabdulkareem (2015) that found that teachers and students are willing to use social media in assessment, but the actual practice is relatively low. Teachers and students still hold a strong belief that social media is for socialization platform only.

2.5. Impacts of using social media in learning and teaching

Using social media in learning and teaching has demonstrated several advantages. First, using social media creates stronger relationships between students and teachers, which students can benefit from through collaboration (Ashraf et al., 2021; Akgül and

Uymaz, 2022). By participating collaboratively on social media, students can create highly interactive environments where they can create and exchange ideas and interact with their teachers (Ashraf et al., 2021). In the study of Akgül and Uymaz (2022), research postulates that collaboration is one of the most significant variables impacting the educational use of Facebook. Second, students have higher trust in collaboration with their peers toward enhancing involvement and participation (Alalwan, 2022) because they can communicate freely and easily (Mahmud et al., 2022). Higher trust in collaboration results in 'increased involvement, participation, the reason for using social media, usefulness, and accessibility of the use' (Alalwan, 2022, p. 9786). Last, embedding social media use in classroom pedagogy can enhance students' learning performance by collaborating and engaging in learning activities that transform students from passive receivers to active learners (Alenezi and Brinthaupt, 2022).

3. Materials and methods

To answer the research questions, we conducted a literature review, including a search and analysis of the initial data collated from databases relevant to the study, then refined the selection for data synthesis according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009).

3.1. Data sources and literature search

An initial search of the literature was conducted through ProQuest (ERIC and Education), and Scopus. We first extracted all studies related to using social media for assessment in schools, published up to May 2022. We did not set a lower boundary for the year of publication to include and review important earlier research. The combination of keywords, *social media, Facebook, Twitter, TikTok, Instagram, YouTube, WhatsApp, Snapchat, Pinterest, Reddit, LinkedIn, student, formative assessment, summative assessment, feedback, self-assessment, peer assessment, assessment for learning, assessment of learning, assessment as learning, questioning, classroom assessment, teacher assessment, high school, junior, senior, secondary, primary,* and *elementary, K-12,* were used to identify the papers in each database. We included the 10 social media with the highest subscriber to expound our literature search. The detailed search strategy syntax used for each database can be seen in Table 1. Articles were included in this review if they were published in peer-reviewed journals in English. There were no restrictions regarding the design of studies: quantitative, qualitative, or mixed-methods.

3.2. Study selection

The literature search based on the inclusion/exclusion criteria identified a total of 167 articles (see Figure 1). After removing the

TABLE 1 Search strategy syntax.

Database	Syntax	Number of Articles
Web of Science	TS = [("social media" OR Facebook OR Twitter OR Tiktok OR Instragram OR Youtube OR WhatsApp OR Snapchat OR Pinterest OR Reddit Or LinkedIn) AND (student) AND ("formative assessment" OR "summative assessment" OR "feedback" OR "self-assessment" or "peer assessment" OR "assessment for learning" OR "assessment of learning" OR "assessment as learning" OR "questioning" OR "classroom assessment" OR "teacher assessment") AND ("high school" OR junior OR senior OR secondary OR primary OR elementary OR "K-12")]	52
Scopus	TITLE-ABS-KEY [("social media" OR Facebook OR Twitter OR Tiktok OR Instragram OR Youtube OR WhatsApp OR Snapchat OR Pinterest OR Reddit Or LinkedIn) AND (student) AND ("formative assessment" OR "summative assessment" OR "feedback" OR "self-assessment" or "peer assessment" OR "assessment for learning" OR "assessment of learning" OR "assessment as learning" OR "questioning" OR "classroom assessment" OR "teacher assessment") AND ("high school" OR junior OR senior OR secondary OR primary OR elementary OR "K-12")]	40
ProQuest	noft ("social media" OR Facebook OR Twitter OR Tiktok OR Instragram OR Youtube OR WhatsApp OR Snapchat OR Pinterest OR Reddit Or LinkedIn) AND noft (student) AND noft ("formative assessment" OR "summative assessment" OR "feedback" OR "self-assessment" or "peer assessment" OR "assessment for learning" OR "assessment of learning" OR "assessment as learning" OR "questioning" OR "classroom assessment" OR "teacher assessment") AND [noft ("high school") OR noft (junior) OR noft (senior) OR noft (secondary) OR noft (primary) OR noft (elementary) OR noft ("K-12")]	121

duplicates, the title and abstract of the articles were reviewed if they met the criteria. The inclusion criteria of our review were: (1) topics relating to social media in assessing students' learning; (2) school contexts of primary or secondary school settings (excluding studies focusing on adult learning, university, and vocational education); (3) peer-reviewed journal articles; (4) use of English language; and (5) access to full-text. The title and abstract of the articles that did not clearly articulate these criteria were excluded. After applying these criteria, 24 articles remained for full-text review.

The 24 full-text articles were downloaded and carefully reviewed by the first, second, and third authors to determine the relevance of the studies for our review purpose (i.e., selecting studies on social media in assessing students' learning). At the final stage, only 17 articles were found to be relevant to the aim of our paper. We synthesized them to answer our research questions (see Figure 1).

3.3. Approach to analysis and synthesis

We used the three stages of thematic synthesis for systematic reviews highlighted in Thomas and Harden (2008). These three stages are (a) line-by-line text coding; (b) identifying specific indicators; and (c) generating theoretical dimensions. The first author developed descriptive and analytical themes and were checked by the second and third. To ensure rigor and consistency of coding, the second and third authors coded the same two articles simultaneously and then compared their coding afterward. The first author confirmed the codes before moving on to the next two articles. Any inconsistencies were discussed to reach a consensus. This process was undertaken for three iterations until a higher degree of consistency was achieved. The interrater reliability (88.89%) was established by

calculating the percent agreement between these two authors. The remaining articles were coded by the second and third authors while frequently negotiating on emerging inconsistencies when they arrived. The first author then checked the final coding.

4. Results

In this section, the results of the thematic analysis of the synthesis literature are presented to answer the research questions.

4.1. Characteristics of included articles

This section presents the context of social media assessment used in the 17 reviewed articles to identify the research contexts, study designs, theoretical framework, and study purposes. Descriptive analysis answers Research Question 1: *What are the main characteristics (study location, school level, research design, and types of social media used) of included studies reporting social media used in assessment?*

4.1.1. Contexts of the studies

As shown in Table 2, studies on using assessment for assessment purposes were undertaken in Malaysia ($n = 3$), Taiwan ($n = 2$), China ($n = 2$), Brazil ($n = 2$), the United States, Australia, Indonesia, Ecuador, Hongkong, Iraq, Thailand, and Turkey. Asia dominated the geographical distribution with 10 out of 15 investigations conducted in Asian nations.

In terms of school level, most of the research was conducted in secondary school settings. This may indicate that students'

social media literacy influences the selection of school settings (e.g., Kio, 2015; Mukhlif and Challob, 2021). Regarding research design, two strategies have dominated the study: survey studies ($n=4$) and Quasi-Experimental ($n=4$). The use of surveys in those studies was accompanied by another approach: field study, intervention, and reflective journal. In contrast, the quasi-experimental design adopts a similar technique consisting of a pre-test at the beginning of the study, an intervention by the researcher in one experiment group, and a post-test at the conclusion of the study to assess students' comprehension of the supplied topics or courses.

4.1.2. Purpose of the study

Four major themes in the study's purposes emerged: social media influences on learning improvement, social media influences on learning activities, social media influences on learning assessment through feedback, and the instructional design comparison between learning through social media use and traditional method use. Although three of these themes are not directly about assessment purposes, they highlight the use of social media for assessment purposes. Hence, they provide important insights to achieve the aim of our paper.

4.1.2.1. Social media and student learning improvement

Six of the 17 articles explore the influence of social media use in improving students' language learning (e.g., Espinoza-Celi and Pintado, 2020). Social media in these papers were used as a medium to practice and improve writing skills (e.g., Miller and Olthouse, 2013; Yuk and Yunus, 2021). Teachers and students use Twitter to analyze their writing improvement (Espinoza-Celi and Pintado, 2020), while Facebook is used to investigate students' development in writing reflection in action (Annamalai and Jaganathan, 2017). Other social media, including Peer Modo in Edmodo (Yuk and Yunus, 2021) is used to evaluate the content quality of students' writing skills. On the other hand, StoryBird.com and KidsBlog (Miller and Olthouse, 2013) are used to examine the critical thinking skills of gifted students.

Apart from its focus on improving writing skills, other papers focus on the distinctive influences of social media use in learning. A study by Mukhlif and Challob (2021) examines the influence of Facebook in improving students' vocabulary knowledge compared to traditional teaching for secondary school students in Iraq. In addition, a study by Yu et al. (2020) investigates some factors that influence social networking in an online self-regulated learning activity through ZhiLiao, a commercial Chinese online learning resource platform for junior high school graduates. It primarily focuses on understanding how social media benefits students' self-regulated learning.

4.1.2.2. Social media and learning activities

Besides evaluating the improvement of students' outcomes, six articles focus more on examining the learning process. Those

articles investigate how social media influences the learning dynamic. For example, a study by Vikneswaran and Krish (2016) explores what motivates English as Second Language user students to write in English on Facebook. In addition, some research examines the use of different functions of social media, such as online schoolwork sharing (Lai et al., 2020), social media-integrated teaching (Liu and Ko, 2020), and synchronous and asynchronous students' online discussion (Huang et al., 2014). These studies highlight the critical role of social media in ensuring learning and assessment activities.

4.1.2.3. Social media and learning assessment through feedback

Three articles explicitly investigated how social media contributes to students' development by providing peer feedback. A study by Wuttisela et al. (2016) addresses the use of social media in improving students' learning by comparing feedback provided by the students and the teachers. It strives to analyze students' reflections as evaluators of the science projects using the D4L + P program compared to the reflections of teachers and experts in Project Based Learning. A study by Kio (2015) identifies the influence of students' feedback on learning activities. It investigates how social media enhance students' learning experiences through a connected feedback model provided by social media. A study by Miller and Olthouse (2013) analyzed the differences between gifted children's offline and online feedback in a writing workshop. These three articles show that social media can be used as a learning instrument to develop students' feedback literacy.

4.1.2.4. Social media and traditional instructional design

Two articles highlight the comparison between the use of social media and traditional instructional design (Miller and Olthouse, 2013; Mukhlif and Challob, 2021). This comparison consists of two aspects: examining the effectiveness of social media use and traditional instruction use in improving students' vocabulary knowledge (Mukhlif and Challob, 2021) and identifying the critical thinking of gifted students in administering online peer feedback within a writing workshop for talented writers (Miller and Olthouse, 2013). The articles strive to identify the influences of using social media on students' learning development compared to the traditional design.

4.2. Assessment in social media learning

A closer look at social media use in learning, assessment, and teaching reveals that various assessments have been used in different contexts. This section thoroughly analyses various social media used for assessment, the type of assessment used, and the outcome measured in the studies. The results below answer our Research Question 2: *What and how have social media been used for assessment?*

FIGURE 1
Study selection flow diagram.
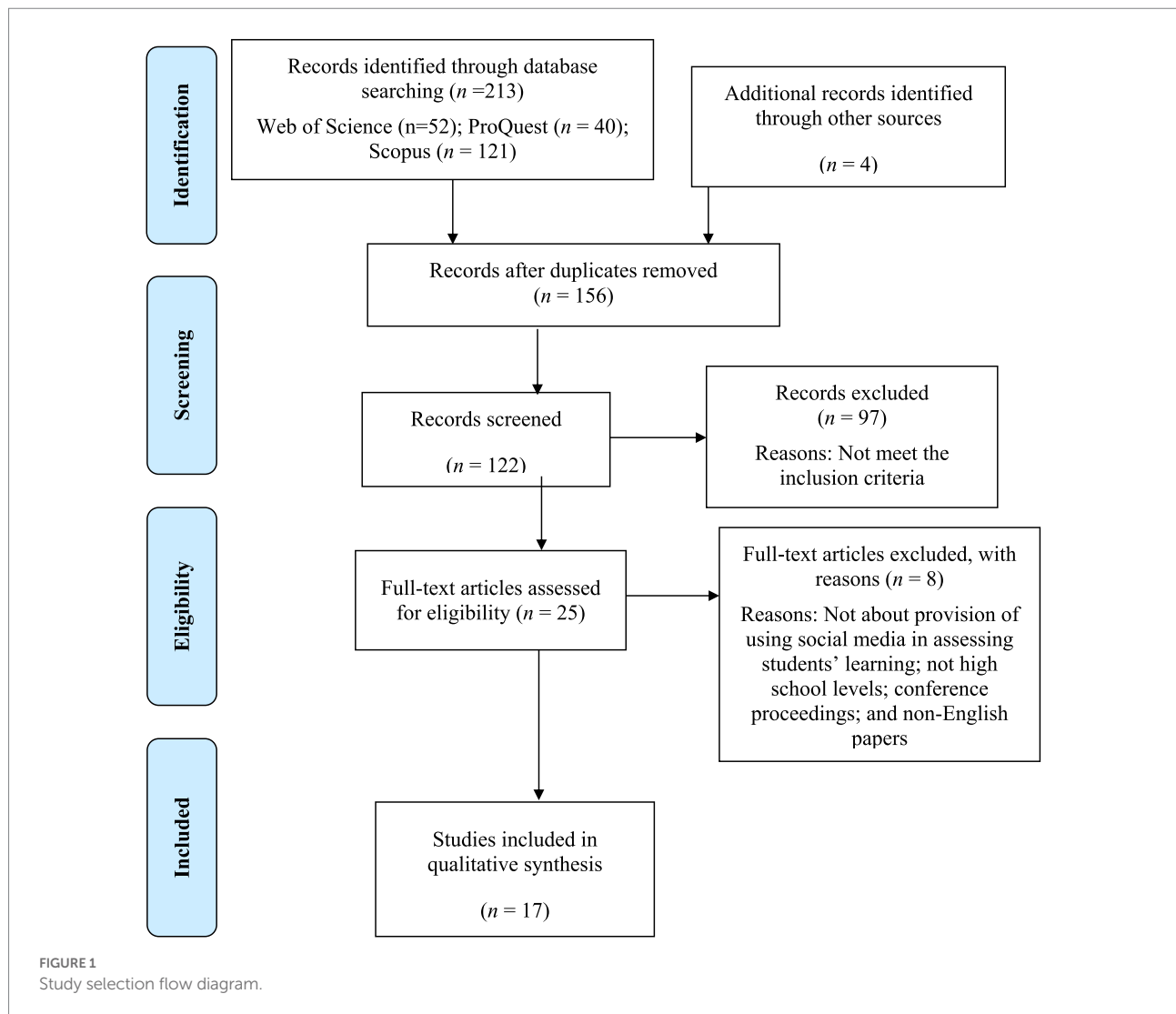
As evidenced in Table 3, various social media platforms have been identified, including Facebook ($n = 7$), WhatsApp ($n = 3$), Twitter ($n = 1$), Line ($n = 1$), Edmodo ($n = 1$), SeeSaw ($n = 1$), Ning ($n = 1$), ZhiLiao ($n = 1$), StoryBird.Com and KidsBlog ($n = 1$), and Designing for Learning and Portfolio or D4L + P ($n = 1$). These platforms are used to implement four assessment strategies.

4.2.1. Peer feedback

Peer feedback is the most common assessment strategy implemented using social media. Students engage and interact with their peers' work posted on social media. They engage in peer feedback through reading, reviewing, and commenting on their peers' work (Vikneswaran and Krish, 2016; Lai et al., 2020). Kio (2015) cites that using social media to elicit and provide peer feedback has benefits regarding the timeliness of the feedback received by students. In addition, students can benefit from various feedbacks received as the interactions and conversations are not limited to two individuals. However, the large number of feedback received by individual students may be overwhelming, and thus,

Casey (2013) proposes an approach by assigning three peers to provide feedback to individual students. Some studies use rubrics as guidelines for peer feedback. Yuk and Yunus (2021) used the Peer-Modo rubric for the content, format, and organization, and mechanics and grammar feedback. Wuttisela et al. (2016) used rubrics to assess content and student effort in completing their work.

4.2.2. Teacher feedback

In teacher feedback, there are two general approaches used. First, immediate teacher feedback is used when students publish their works on social media. Teachers provide immediate feedback upon reading and commenting on students' posted work. This process is seen to achieve timeliness of feedback where students can immediately reflect on feedback and act on it to revise their work (Kio, 2015; Annamalai and Jaganathan, 2017; Mukhlif and Challob, 2021). In addition to commenting on students' work, some teachers utilize this feedback approach to remind students of the deadline for uploading projects and assignments (Nuray, 2019). The feedback also serves as a

TABLE 2 Summary of the articles included in the review.

Authors	Country	Design	Theoretical approaches	Purposes	School level
Mukhlif and Challob (2021)	Iraq	Quasi experimental	Computer-Mediated Communication, Social Constructivism (Vygotsky)	Comparing the use of social media and the traditional instruction in learning vocabulary	High School & Mixed
Yuk and Yunus (2021)	Malaysia	Quasi Experimental	Not mentioned	The use of social media in improving writing skill	High School & Mixed
Liu and Ko (2020)	Taiwan	Quasi experimental	Design Thinking: brainstorming, lateral thinking and critical judgment	The use of social media in improving students' learning	Primary
Espinoza-Celi and Pintado (2020)	Ecuador	Survey and Field Research	Computer Assisted Learning (CALL)	The use of social media in improving writing skill	High School & Mixed
Yu et al. (2020)	China	Descriptive study	Self-Regulated Learning and Social Learning Theory of Bandura	The use of social media in improving self-regulated learning	Primary School
Lai et al. (2020)	Hongkong	Survey	Social Learning and Social Interaction	The use of social media in analyzing students' learning	Primary school
Nuray (2019)	Turkey	semi-structured interviews	Not mentioned	The use of social media in analyzing students' learning	High School & Mixed
Annamalai and Jaganathan (2017)	Malaysia	Case study	Reflection	The use of social media in improving writing skill	High School & Mixed
De Barros et al. (2017)	Brazil	Survey and Intervention	Complexity Thinking and Blended Learning	The use of social media in improving students' learning	High School & Mixed
Bezerra et al. (2021)	Brazil	Qualitative	Not mentioned	To analyze the creative feedback in the mathematics field	High school& Mixed
Wuttisela et al. (2016)	Thailand	Intervention	Not mentioned	The use of social media in improving students' learning	Primary school
Vikneswaran and Krish (2016)	Malaysia	semi-structured interviews	Not mentioned	The use of social media in improving students' writing	Primary School
Kio (2015)	China	reflective journal and survey	Feedback	The use of social media in improving students' learning through a connected feedback model	High School & Mixed
Huang et al. (2014)	Taiwan	Quasi Experimental	Nature of Science (NOS)	The use of social media in improving students' science learning	High School & Mixed
Casey (2013)	Australia	Action research	Not mentioned	Comparing the use of social media and the traditional instruction	High School & Mixed
Miller and Olthouse (2013)	United States	Comparative Study	Bloom's Taxonomy	Comparing the use of social media and the traditional instruction in writing	High School & Mixed
Herwin et al. (2021)	Indonesia	Transcendental Phenomonology	Not mentioned	Analyzing the learning organization strategies during the COVID-19 pandemic	Primary School

mechanism for teacher to strengthen students' understanding on the learning topic since learning does not take place in a real time context/distance learning (Herwin et al., 2021). The feedback is also viewed as a support system for students which facilitate them to reflect, analyze, and judge their own ideas when completing their assigned tasks (Bezerra et al., 2021).

Other articles report a more purposeful feedback mechanism. Using rubrics helps teachers and students improve clarity on the feedback process and content, which benefits students to improve their work further. Wuttisela et al. (2016) and Liu and Ko (2020) illustrate how teachers use rubrics in assessing students' work and providing detailed feedback based on criteria and standards included in the rubrics. Meanwhile, Vikneswaran and Krish (2016) use a checklist to analyze the students' writing posted on the Facebook wall. This checklist helps to ensure a more consistent and reliable assessment of and feedback on students' work.

4.2.3. Pre-test and post-test

Four articles employed social media to administer the pre/post-tests. Mukhlif and Challob (2021) and Huang et al. (2014) used Facebook to administer the pre-test and post-test. The former administered the pre-test by posting mini dialogues with omitted letters. The treatment period included weeks 2–11, and the post-test was given in the form of a crossword problem in week 12. The latter study utilized Facebook to engage students in discussing scientific news as a pre-test and post-test, which were administered before and after the intervention.

A study by Yuk and Yunus (2021) used Edmodo to administer the pre-test by providing an overview of the essay's key points and supporting arguments to the student in the experiment group. All group respondents reviewed the outline as peer feedback. The students then composed their initial draft based on these comments, which was regarded as the post-test. Meanwhile, Espinoza-Celi and Pintado (2020) administered the pre-test and post-test consisting of vocabulary and grammar derived from the students' textbooks *via* Twitter. Both tests were delivered to determine their initial English proficiency in writing. Another post-test was also used to examine students' knowledge retention, where students were asked questionnaires 3 weeks after the intervention.

4.2.4. Self-assessment

One article demonstrates the use of social media for self-assessment. The study of Yu et al. (2020), conducted on junior high school graduates, included students monitoring their learning using the self-evaluation checklist embedded in the platform and self-regulation through their completed learning and assessment activities.

4.3. Issues in using social media for assessment purposes

Three emerging issues have been identified when using social media for assessment purposes: workload issues, students'

inappropriate use of social media, and low student feedback literacy. These issues answer Research Question 3: *What are the issues with using social media in assessment?*

Apart from its benefits, five articles highlight emerging issues related to administering assessments through social media.

4.3.1. Workload issues

Due to its affordances for synchronous and asynchronous engagement, teachers reported receiving messages even at unreasonable hours. They describe spending more time responding to students' enquiries and providing feedback on their work (Nuray, 2019). The affordances of social media for flexibility blur the distinction between work and personal life. In addition, teachers report allocating extra hours to monitor students' engagement in assessment to check possible student outputs, particularly if the outputs are publicly available (Nuray, 2019). They are forced to check students' responses to assessment activities for language errors for fear of being criticized publicly (De Barros et al., 2017).

4.3.2. Students' inappropriate use of social media

One study raises an issue related to inappropriate language when responding to and commenting on other students' work. In a student discussion using the WhatsApp platform, Nuray (2019) reports that some students used inappropriate and offensive language in an educational environment. Also, students tend to share unrelated and inappropriate materials embedded in their responses or feedback on social media. In both scenarios, teachers need to moderate the discussions among students. Since feedback from students is not always positive, teachers need to ensure that they thoroughly moderate peer feedback as soon as students post them (Kio, 2015).

4.3.3. Insufficient feedback literacy for students

Two articles highlight the problem with students' feedback literacy, which is the ability of the students to give feedback to their peers or to reflect and act on teacher feedback to improve their work. A study by Annamalai and Jaganathan (2017) shows that proper feedback provision would benefit students to deliver more insightful feedback to their peers' writing. It would also leverage students' capacity to become self-critical when performing their writing works.

Meanwhile, a study by Miller and Olthouse (2013) discusses some emerging issues with student feedback. First, vague comments on students' feedback. Students' opinions were frequently expressed in social media content without a clear conception of their thoughts. This attitude is known as "informal lingo," where students provide vague comments that do not provide specific insights to help their peers improve their output. Second, informal language is used in giving feedback instead of formal language. Students assume an informal linguistic function within this social media use.

TABLE 3 Social media used for assessment.

Type of assessment	Social media used	Description of assessment	Study
Teacher Feedback	Facebook	Immediate feedback from teacher on the posted works.	Mukhlif and Challob (2021)
		Teacher provided feedback and students were able to reread, evaluate, and revise their own and their peers' texts.	Annamalai and Jaganathan (2017)
		Feedback was provided in the form of formative assessment aimed at contributing to the improvement of students' learning instead of measuring what was done. The feature of online discussion supplied teachers with sufficient information for formative assessment. However, regardless of that information, the mechanism for the assessment is not clearly mentioned.	De Barros et al. (2017)
		Students were required to produce drafts of their writings based on the three topics posted on the Facebook class page wall. These drafts were then analyzed by teachers using the designated checklist.	Vikneswaran and Krish (2016)
		Students receive timely feedback both from other students and teacher. Students were also able to collect feedback from multiple sources on Facebook as conversations were not limited to only two people. Feedback on Facebook is not limited to information but may include motivation and encouragement.	Kio (2015)
	Ning	Teachers provided feedback on their published work on the blog	Casey (2013)
	An online tool, Designing for Learning and Portfolio (D4L + P),	Teachers and experts assess students' proposal also based on the marking scheme rubric.	Wuttisela et al. (2016)
	Line App Instant Messaging and Facebook Instant Messaging	Students in the experiment class were assigned to a classroom assessment graded by teachers based on topic selection, logo structure, logotype structure, color application, and symbol pattern	Liu and Ko (2020)
	WhatsApp	Teachers delivered feedback within the process planning (class assignment). Teacher also reminded students about the deadline for projects and assignment.	Nuray (2019)
		The constant feedback exchanged between teacher and student during the ongoing work of completing assigned tasks on the Mathematical field	Bezerra et al. (2021)
		Teachers provided feedback on students' responses and work posted on WhatsApp during the asynchronous learning.	Herwin et al. (2021)
Peer-Feedback	Facebook	Immediate feedback from other students on the posted works	Mukhlif and Challob (2021)
		Peers provided feedback so that students were able to reread, evaluate and revise their own and their peers' texts. It motivated students to help each other;	Annamalai and Jaganathan (2017)
		Students receive timely feedback both from other students and teacher. Students were also able to collect feedback from multiple sources on Facebook as conversations were not limited to only two people.	Kio (2015)
		comments and likes from their friends on Facebook page during the writing process	Vikneswaran and Krish (2016)
	Line App Instant Messaging and Facebook Instant Messaging	Discussions and feedback among students and between the students and instructors using social media platform	Liu and Ko (2020)
	Edmodo	Students in the experimental outlined the main ideas and supporting ideas of their essay (pre-test). Then, all respondents in the group reviewed (peer-feedback) the outline. Based on those feedbacks, the students then wrote their first draft (post-test).	Yuk and Yunus (2021)
	ZhiLiao	One student answered the other student's questions or responded to the other student's thoughts on the platform.	Yu et al. (2020)

(Continued)

TABLE 3 (Continued)

Type of assessment	Social media used	Description of assessment	Study
	SeeSaw	Student engaged and interacted around peer works. They commented on their friends' work on SeeSaw. The peer-reviewed occurred when student commented each other's' work.	Lai et al. (2020)
	An online tool, Designing for Learning and Portfolio (D4L+P),	Each student gave feedback for the project proposals of the three files and assessed the project proposals based on Marking Scheme Rubric. Points for effort were awarded (1 to 5) for completion of the proposals.	Wuttisela et al. (2016)
	Ning	Quick feedback and responses on synchronous discussion. Students commented on the platform and provided constructive feedback to their peers. As part of this peer-to-peer interaction, students had three peer mentors who were asked to provide constructive feedback on the student's work, and these mentors were eventually expected to give peer assessment.	Casey (2013)
	Social writing sites, Storybird.com and KidsBlog	Offline and online. First, Offline feedback was submitted on a teacher designed rubric, and then incorporated into a revised manuscript using Microsoft Word. Each comment was coded according to one of the levels of Bloom's Taxonomy. Second, online feedback included students' writings in social writing sites. Each comment was coded according to one of the levels of Bloom's Taxonomy.	Miller and Olthouse (2013)
Pre-test and Post-test	Facebook	Pre-test was given in the pre-study phase by representing mini dialogues with omitting unneeded letters. The treatment phase was during week 2–11, and the post-test was given in week 12 by representing crossword puzzle.	Mukhlif and Challob (2021)
		Student discussed seven scientific news posted on Facebook. The questionnaires were asked before the intervention (the discussion), and immediately after. The test was administered to the students 3 weeks after the intervention (Retention Post-Test)	Huang et al. (2014)
	Twitter	Pre-test was applied to the students to examine their English level. Post-test was applied to determine whether there has been any writing skills improvement or setback. Similar tests were applied in both pre and post-test consisting of vocabulary and grammar. The topics are taken from their textbooks.	Espinoza-Celi and Pintado (2020)
	Edmodo	The writing product were evaluated for pre-test and post-test using Peer-Modo rubric (content, format and organization, and mechanics and grammar):	Yuk and Yunus (2021)
Self-Assessment	Zhi Liao	Some tools are provided on the platform, including some suggested self-evaluating learning.	Yu et al. (2020)

Rather than replying within the formal confines of the online writing space, students write as if they were texting the writer or making a Facebook comment. In addition, there are students who are reluctant to engage in peer feedback. The reluctance to publish anything too detailed may be due to the social view that criticizing a piece of writing has a bad connotation and might influence social relations with their classmates.

4.4. Recommendations from the Studies

Two main recommendations emerge from previous studies to provide a better learning and assessment experience: students' readiness to learn on social media and teachers' preparation to learn on social media.

4.4.1. Students' readiness to use social media in assessment

A study by Miller and Olthouse (2013) recommends some critical aspects of developing student readiness. Foremost, teachers must act as role models on how students should administer good feedback that promotes students' critical thinking. Social support for students using technology in learning is essential for effective assessment processes. A supportive learning experience will help students understand that providing constructive feedback is not always praising and identifying their peers' strengths. Instead, it is about exercising critical thinking skills to identify areas that can further be improved and, if possible, suggest strategies to improve. In addition to those challenges, two studies highlight the importance of providing explicit training to students before engaging them in peer feedback (Miller and Olthouse, 2013; Annamalai and Jaganathan, 2017).

This will address the purposes, content, process, and outcomes of engaging students in assessment.

4.4.2. Teachers' preparation to learn on social media

Two studies mention the importance of preparing teachers to administer assessment on social media. A study by Liu and Ko (2020) argues that teachers should be prepared to incorporate social media into their assessment practices. Teachers also need to be aware that students' use of social media requires close supervision and immediate feedback. In addition, a study by Vikneswaran and Krish (2016) reinforces the argument that teachers need to explore new ways of assessing students' learning using social media. It is inevitable that social media use for learning purposes has increased, so teachers should break away from the traditional method and embrace the contemporary methods to accommodate the needs of today's generation of students.

5. Discussion

Our study provides an initial step to understanding how social media for assessment purposes has been researched and reported in the literature and identifies future directions for practice and research. There are noteworthy findings that emerged in this paper.

Foremost, there is emerging evidence that social media can be used as alternative platforms for assessment purposes. Outcomes published are mostly positive ranging from providing timely and effective feedback (e.g., Annamalai and Jaganathan, 2017; Nuray, 2019; Espinoza-Celi and Pintado, 2020; Liu and Ko, 2020; Mukhlif and Challob, 2021), monitoring student progress and providing support to those who need assistance (Espinoza-Celi and Pintado, 2020; Liu & Ko, 2020), increased student outcomes (De Barros et al., 2017; Lai et al., 2020; Yuk and Yunus, 2021), and improving teachers' practices through the reflection of their experience (De Barros et al., 2017). The outcomes reported by the 17 studies provide preliminary evidence that social media can serve as alternative platforms for implementing various assessment strategies. Despite methodological differences among studies investigating the use of social media for assessment purposes, positive outcomes have been reported. Eliciting and giving feedback using social media has a positive impact on improving student learning (Kio, 2015; Annamalai and Jaganathan, 2017; Mukhlif and Challob, 2021). The immediate feedback received by students enables them to revise their work, which is consistent with the principle of effective feedback practices where timeliness is critical for supporting student learning (Hattie and Timperley, 2007; Black and Wiliam, 2018). Positive outcomes are also found in administering peer assessment using social media (Casey, 2013; Miller and Olthouse, 2013; Yuk and Yunus, 2021). Individual students benefit from the feedback provided by their peers. The same evidence is seen in face-to-face peer assessment activities where students' engagement in identifying some areas needing improvement and analyzing their classmate's work and identifying some areas needing improvement improve their learning (Hovardas et al., 2014). Students who receive peer feedback can use it to revise their work while those who give feedback benefit from understanding how their classmates interpret the assessment, which can provide them another lens to review their work (Kaufman and Schunn, 2011). Moreover, self-assessment is also successfully implemented using social media. Although the study of Yu et al. (2020) is limited only to using a checklist to engage students in self-assessment, it has demonstrated that this process increases student-regulation. The intersection between self-assessment and self-regulation was shown by Yan et al. (2020), although they used diaries to engage students in self-assessment.

There are three major issues on the use of social media for assessment purposes, including teacher working, inappropriate use of technology and student engagement and feedback literacy. Firstly, the workload implications of using social media. Due to the accessibility and affordances of social media for immediate feedback (Alenezi and Brinthaupt, 2022), teachers spend more time reading students' work and providing feedback (Nuray, 2019). Teacher workload in assessment has been an ongoing issue especially when providing individual feedback for many classes (Carless and Winstone, 2020), but there is extra pressure in an online platform because it is publicly available. Teachers take extra time to correct students' work for fear that the output of students will reflect the effectiveness of their teaching (De Barros et al., 2017). Secondly, there is a tendency for students to use inappropriate language when responding to and commenting on their peer's work (Nuray, 2019). Addressing this concern requires enhancing students' digital literacy to become responsible users of social media to support their learning without the risk of engaging in inappropriate behavior online (Gleason and Sam von, 2018). Thirdly, the effectiveness of using social media for assessment purposes depends largely on students' effective engagement in assessment (Miller and Olthouse, 2013; Annamalai and Jaganathan, 2017). This means that students should have a certain level of assessment knowledge and skills, known as assessment literacy (Hannigan et al., 2022), to understand the purpose and aim of assessment, and the processes required to optimize the impact of their engagement in assessment on their learning. In our findings, students' ability to engage in peer assessment is limited by their insufficient feedback literacy. There are students who provide vague comments that are not aligned to the learning outcomes and criteria, which the recipient finds difficult to act on (Miller and Olthouse, 2013).

Apart from the outcomes and issues reported, there are significant gaps we have identified. With only 17 relevant articles extracted from three databases, this number indicates that research on the use of social media for assessment purposes is very limited. Among those studies, 66% were conducted in Asian countries, with only one study from countries like the United States, Australia, Brazil, Ecuador, and Turkey. The limited number of studies highlights one apparent gap in the literature in terms of the adoption of social media for assessment purposes.

We cannot make any assumptions relating to the preferential use of social media or issues that make them less popular for assessment purposes. In addition, it is difficult to make inferences about the contextual differences in using social media for assessment purposes, even though there is a range of evidence for the context-based nature of assessment (Taylor, 2013; Alonzo et al., 2021). Notably, 35.39% of the studies synthesized focus on language learning, and thus limit the insights of the utility of social media in other key learning areas. The use of social media in other key learning areas is worthwhile exploring because the effectiveness of assessment requires adaptation for each key learning area (Scarino, 2017). What is evident at this stage is that critical enquiries about the intersections of assessment and social media are limited only to exploring if they can be used as alternative platforms.

Moreover, in 52.94% of the studies, the use of social media for assessment purposes is tacked on to the pedagogical use of assessment. This approach is consistent with the true nature of the intersections of assessment, learning, and teaching, where assessment is the central feature of learning and teaching (Broadfoot et al., 1999). Investigation of assessment within a broader pedagogical model is ideal because it highlights how assessment is used to inform learning and teaching activities (Black and Wiliam, 2018). However, in the studies mentioned above, the link between assessment, learning and teaching and their intersections with the use of social media are not explicitly discussed. In most articles (76.47%), assessment is not clearly positioned as driving the learning and teaching activities. The disconnect between assessment and pedagogy is one of the major criticisms in assessment (Baird et al., 2017). For research involving the pedagogical functions of assessment, the findings must clearly demonstrate how assessment and assessment data inform pedagogical approaches, such that learning, and teaching activities are modified to adequately address the learning needs of the students (Alonzo, 2016, 2020).

In addition, research on the use of social media for assessment is fragmented. There is a distinct gap in the literature regarding the effective use of social media for assessment purposes. The studies analyzed in this paper did not explicitly investigate the intersections between assessment and social media. At this stage of research, what has been reported is the outcomes of using social media and the gains in student outcomes. We need broader investigations of the direct and indirect effects of using social media for assessment on teacher pedagogical approaches and student learning, engagement, and outcomes. Additional investigations should critically explore what factors influence teachers and students to use social media for assessment purposes. The question of whether factors of convenience or affordances influence the use of specific social media remains inconclusive.

Even more so, the number of social media reports for assessment purposes is limited. Only nine social media have been reported, with Facebook being the most popular (e.g., Huang et al., 2014; Annamalai and Jaganathan, 2017; De Barros et al.,

2017). This limited number of research presents an enormous opportunity as most of the students and teachers are using or have access to social media. Exploring other social media platforms for assessment purposes may highlight two important issues: What should be the affordances of social media to become effective assessment platforms and are social media perceived by teachers and students to be just for social networking?

Subsequently, another significant gap is the investigation of teachers' and students' dispositions in using social media for assessment purposes. It is well documented that a person's beliefs and perceptions influence their actual action (Fives and Buehl, 2016; Beswick and Alonzo, 2022); hence, this critical enquiry area is notably important to contribute to the theorisation of using social media for assessment purposes. The interplay between teachers' and students' dispositions, knowledge and skills will provide insights into social media adoption in the assessment context. This gap in the literature is directly related to the issue raised above on the perception of teachers and students on the function of social media.

Finally, the discussion around ensuring the integrity of assessment implemented using social media is lacking in the literature. Issues related to trustworthiness (Alonzo, 2020), ethical practice and cheating (Sadler, 2009) in online assessments continue to raise validity concerns.

6. Conclusion

Our study aimed to investigate the extant literature on how social media are used for assessment purposes. Our review of the literature using the PRISMA methodology extracted 17 articles from three databases. Our findings indicate emerging evidence that social media can be used as alternative platforms to implement assessment strategies. There are reported positive outcomes, including providing timely and effective feedback, monitoring student progress and providing support to those who need assistance, increasing student outcomes, and improving teachers' practices. There are also issues that hinder the effectiveness of social media for implementing assessment. These include increased teacher workload, the need for constraint moderation of students' peer feedback, particularly if they are publicly available, and students' feedback literacy. We need more studies to better understand the intersections of social media, assessment and learning to develop a strong theorisation.

Like many studies, we acnowledge some limitations to our research. The combination of our keywords might have limited our search. For future studies, the social media keyword can be further expounded to include all other emerging social media platforms. Also, we excluded gray literature, book chapters, reports, and books. These publications might have other critical information about using social media for the implementation of assessment. Furthermore, we did not include studies from the higher education context. It would be worthwhile to explore how higher education uses social media for assessment purposes.

Author contributions

DA conceptualized the paper, identified the key insights, searched the literature, performed coding and analysis, wrote the draft, and monitored the progress of the team. CO conceptualized the paper, searched the literature, performed coding and analysis, and wrote the draft. WW performed coding and analysis and wrote the draft. CH edited and proofread the paper and wrote the conclusion section. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Investigating the impact of online language exchanges on second language speaking and willingness to communicate of Chinese EFL learners: a mixed methods study

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Introduction: The current study aims to investigate the impact of online language exchanges on the speaking skills and willingness to communicate (WTC) of Chinese postgraduate students in an advanced English program. The study compares two intact classes: e-tandem, who communicate with foreign English speakers through the Tandem language exchange application, and conventional, who participate in collaborative speaking tasks inside the class. The study also examines the attitudes and perceptions of the EFL learners toward the online language exchanges.

Methods: 58 Chinese postgraduate students were recruited from a second-year advanced English program and divided into two intact classes: e-tandem and conventional. The e-tandem group used the Tandem language exchange application to communicate with foreign English speakers online, while the conventional group participated in collaborative speaking tasks inside the class. The data were collected through the IELTS speaking module, WTC scale, and semi-structured interviews. The data were analyzed using descriptive and inferential statistics.

Results: Both groups showed improvement in their speaking skills and WTC. However, the e-tandem group outperformed the conventional group. The findings indicate that online language exchanges have a positive impact on the speaking skills and WTC of EFL learners. The EFL learners also had positive attitudes and perceptions toward the online language exchanges, although some expressed reservations.

Discussion: The study concludes that online language exchanges can be an effective tool for improving the speaking skills and WTC of EFL learners. The study also suggests that collaborative speaking courses in EFL settings should consider incorporating online language exchanges. However, the study also highlights the need to address the concerns and reservations expressed by some EFL learners regarding online language exchanges. Overall, the study has important pedagogical implications for EFL settings, suggesting that online language exchanges can enhance speaking skills and WTC.

KEYWORDS

online language exchanges, e-tandem, EFL context, speaking skills, WTC

1. Introduction

Second language (L2) speaking is a complex skill which requires learners' integration of various language components such as vocabulary, grammar, and pronunciation to communicate effectively. However, in traditional English as a foreign language (EFL) classrooms, opportunities

for students to practice speaking are often limited (Hwang et al., 2016). Moreover, learners may lack motivation and confidence in using their L2, resulting in low willingness to communicate (WTC) levels (Tai and Chen, 2020). Online language exchanges might provide a promising avenue for learners to engage in authentic conversations with native speakers and other L2 learners (Hagley, 2016, 2020; Watkins, 2019; O'Dowd, 2021), which can enhance their speaking competencies and increase their WTC levels (Rahimi and Fathi, 2022).

Virtual exchanges have been studied and explored from a wide range of angles (O'Dowd, 2018; Walker, 2018; Baroni et al., 2019; Hauck, 2019; Resnik and Schallmoser, 2019; Dooly and Vinagre, 2021; Lenkaitis and Loranc, 2021; Wu and Miller, 2021; Yeh and Heng, 2022). According to academics, all programs that enable online interpersonal interactions between students from various countries to learn languages or other courses should be referred to as virtual exchanges (O'Dowd, 2018; Hilliker, 2020). E-tandem, as a type of virtual exchange, is the online exchange between two language learners with various native languages who exchange their own language knowledge and abilities with their partners (Belz, 2003; Dooly and Sadler, 2013). Through online communication with their partners, learners can improve their language learning skills, such as speaking and writing skills (Gilmore, 2009; Bakar et al., 2013; Sangeetha, 2016; Fathi and Rahimi, 2022; Rahimi and Fathi, 2022).

Online exchanges are believed to address the time constraints and administrative restrictions which are common in speaking classes (Watkins, 2019; Wulandari, 2019; Zhao et al., 2020; Kinasih and Olivia, 2022; Pratiwi et al., 2022). Through online exchanges, learners can mediate each other's speaking abilities (Rahimi and Fathi, 2022). Due to more exposure to and use of English in English-speaking contexts, learners also have more opportunities to connect with and develop their classmates' speaking abilities outside of the classroom (Wu et al., 2017; Wu and Miller, 2021). Because of this, learners in non-English-speaking nations can have more chances to participate in group speaking activities, which are meant to help students improve their speaking abilities (Liu et al., 2023).

The majority of prior research on tandem language learning focused on peer interaction between tandem partners in various settings (Bower and Kawaguchi, 2011). For example, it has been revealed that e-tandem language learning can enhance learners' engagement in interactive language learning activities (Ware and Kessler, 2016) and increase learners' academic achievement (Jaime et al., 2013). However, as there is a limited number of research in the EFL context focusing on the authenticity of tandem learning in formal educational situations, more research on tandem learning is needed. On the other hand, insufficient research studies have concentrated on the role of e-tandem language learning in developing EFL learners' oral proficiency and engagement.

In the meantime, English language learning has become growingly important in China, both as a tool for communication in the global economy and as a means to enhance one's career prospects. While many Chinese EFL learners have opportunities to study English in a traditional classroom setting, there is a growing interest in online language exchanges as a way to improve speaking skills and increase willingness to communicate in English. However, despite the potential benefits of online language exchanges, little research has been conducted on their efficacy among Chinese EFL learners. Therefore, the aim of the present study is to investigate the impact of online language exchanges on the speaking skills and willingness to communicate of Chinese EFL learners.

Additionally, given the unique characteristics of the Chinese EFL context, including cultural factors and educational practices, it is important to explore how these factors may impact the effectiveness of online language exchanges. Additionally, while previous research has examined the impact of language exchanges on language learning outcomes, little is known about how Chinese EFL learners perceive and experience these exchanges. As a result, the present study investigated the effect of e-tandem language learning on Chinese EFL learners' speaking performance and willingness to communicate. Willingness to communicate is referred to as learners' motivation to participate in communicative speaking activities (Kruk, 2019). The findings implied that EFL learners communicate with English language speakers from various nations to improve their language learning skills, such as their speaking performance. Pedagogical implications are proposed for EFL teachers to engage EFL learners in more interactive, engaging, and authentic communicative speaking activities with online language learners of English.

2. Literature review

2.1. Theoretical framework

The interactive speaking activities in both classrooms in the current study adhere to Vygotsky's (1984) social constructivism of learning. Vygotsky (1984) contends that interactions between pupils and smart peers can help them gradually internalize and activate higher forms of consciousness on their own. In other words, "every function in [students'] cultural development appears twice: first, on the social level, and later, on the individual level; first, between [students] (inter-psychological), and then, inside [individual students] (intra-psychological)" (Vygotsky, 1986, p. 57). The gap between [students'] developmental level as defined by autonomous problem solving and the greater level of potential development as identified through problem solving… in partnership with more capable peers is at the heart of Vygotsky's social constructivism which is referred to as learners' zone of proximal development (ZPD) or potential level of functioning (Vygotsky, 1984; Poehner et al., 2015). Learners can reach their ZPD via the support and interaction with other learners.

Several scholars suggest that learners' interactive activities with peers can extend beyond interactions between less and more capable learners to interactions between students in pair and group work activities. In such activities, students can play the roles of both more and less capable people to help one another complete tasks (Storch, 2002; Kim, 2008). This can enable students to interact, co-construct their language skills, and reach their ZPD by sharing their diverse language abilities and knowledge. The current study employs Vygotsky's social constructivism to engage EFL students in interactive speaking exercises in both traditional and e-tandem classes. However, the way the two groups conduct their speaking exercises distinguishes the two groups.

2.2. E-tandem language learning

E-tandem is defined as students' online communication with either students from different geographical areas or native speakers of the target language (Telles and Vassalo, 2006; Dooly and Sadler, 2013). It entails the use of online communication technologies by language

learners who are geographically distant to foster the development of (1) linguistic proficiency in a foreign language and (2) intercultural competence. In other words, by engaging in such communication, students can offer and receive real input and output while also developing their language learning skills (Belz, 2003, p. 68).

A number of studies addressed the effect of e-tandem language learning on different factors in the English language context (Garcia and Appel, 2016; Pomino and Gil-Salom, 2016; Fondo and Erdocia, 2018). For instance, Resnik and Schallmoser (2019) investigated the effect of e-tandem on language students' language learning achievement. German students from the United Kingdom and the United States were paired with English speakers from an Austrian institution. The study attempted to pinpoint the connections between e-tandem language learning and foreign language enjoyment using information from 19 in-depth interviews. The results showed that most interviewees believed that e-tandem language learning increased their enthusiasm for studying other languages. Additionally, a variety of explanations for why students felt that learning a language via e-tandem was enjoyable were revealed, including having real-world conversations in the target language with native speakers, viewing one another as cultural interpreters, and a different power dynamic from language classroom contexts that put students at ease. The interviewees claimed that these features in particular boosted their happiness and raised their interest in using and studying the language. The results show that e-tandem language learning can be a tool to increase foreign language learners' perceptions of enjoyment, and they also show that the social and private aspects of foreign language enjoyment appear to be connected.

Garcia and Appel (2016) studied the effect of an e-tandem program on learners' communication with native English speakers and use of the target language. The e-tandem program included various discussion contexts and goals for the students to achieve. Data was collected through observations of video-recorded conversations of two language learners. The study found that learner interaction was influenced by task types and proficiency levels. Similarly, Kobayashi (2021) investigated the impact of e-tandem on students' anxiety and reluctance to speak English when conversing with foreigners. The study focused on three Chinese undergraduate students in the United States and two Japanese undergraduate students in Japan through questionnaires before and after eight e-tandem sessions. The study found that students' anxiety and unwillingness to speak in English significantly decreased after participating in the e-tandem program.

Lewis and Qian (2021) explored the use of e-tandem learning by adult distance learners with minimal second language skills. United Kingdom and Chinese learner engagement and development were checked via analysis of email correspondence, transcripts of conversations and interviews, surveys, and learning diaries. The results revealed that there was a lot of evidence for both intercultural learning and the acquisition of a second language. The findings provided pedagogical recommendations for how e-tandem language learning should be designed, with a focus on how to support e-tandem exchanges where participants have limited second language proficiency.

2.3. E-tandem and speaking performance

Several researchers have also corroborated the effective role of e-tandem language learning programs on learners' oral skills (Elia,

2006; Canals, 2020; Lewis and Qian, 2021; Huilca Centeno, 2022). For example, Canals (2020) examined the motivation, communication, and teamwork of EFL learners as they interacted with native speakers in an online language exchange setting to see how their speaking abilities were developing. The results demonstrated that online language interaction improved the learners' oral communication skills, motivation, and cooperation with other peers during the communicative tasks. Further analysis of the data revealed that learners with lower competence levels were more significantly affected by virtual language exchange in terms of oral abilities. In addition, Ware and Kessler (2016) investigated how interactions between second language learners are affected by online language exchange. According to the results, the students' frequent information-seeking queries helped them get involved in partner-based interactive activities. The findings also suggested that the teacher may enhance student participation in the secondary learning setting by offering cues, fostering a secure online environment, and monitoring, directing, and interacting with the students.

In the study of Kawaguchi (2016), an e-tandem second language learning activity was evaluated using synchronous text-based computer-mediated communication. This exercise involved Japanese second language students in Australia and English second language students in Japan collaborating on a predetermined topic over three lessons, exchanging texts with each other. The results showed that engaging in meaning discussions and receiving corrective feedback had very positive effects. Furthermore, compared to casual conversation, the pace of the negotiation turns was significantly higher, and most students demonstrated growth in morphological and/or grammatical aspects. Therefore, while the use of synchronous computer-mediated communication for e-tandem learning in a second language can be beneficial, the instructor should carefully evaluate the activity and monitor student progress to ensure that it promotes language learning.

In a recent study conducted by Rahimi and Fathi (2022), the impact of e-tandem on the speaking abilities and willingness to communicate of EFL students was examined. EFL students in the e-tandem class used the Tandem language exchange application to communicate with foreign English speakers online, while those in the traditional class engaged in group speaking exercises in class. Results indicated that both groups showed improvement in speaking abilities and willingness to communicate, with the e-tandem group performing better than the traditional group. Qualitative analysis also produced several themes and categories representing the positive perceptions of the e-tandem speaking activities among students.

3. Purpose of the study

The research study demonstrated that e-tandem helped learners improve both their speaking abilities (Canals, 2020; Rahimi and Fathi, 2022) and their overall language learning (Garcia and Appel, 2016; Resnik and Schallmoser, 2019). The effect of e-tandem on EFL students' speaking abilities and willingness to communicate in EFL contexts, however, appears to have not been sufficiently studied up to this point. In order to get further insight into the related literature, the current study investigated the effect of e-tandem on the speaking ability and willingness to communicate of Chinese EFL students.

4. Methods

The present study utilized an explanatory sequential mixed methods research design (Ivankova et al., 2006) to investigate the impact of online language exchanges on the speaking skills and WTC of Chinese EFL learners. The researcher began with the collection and analysis of quantitative data through the administration of the IELTS speaking module and the WTC scale. Then, the qualitative data were gathered through semi-structured interviews to explain and elaborate on the quantitative results. The qualitative data provided valuable insights into the learners' perceptions and attitudes toward online language exchanges, resulting in a more comprehensive and in-depth understanding of the impact of online language exchanges on EFL learners.

4.1. Participants

To conduct this study, the convenience sampling method (Rose et al., 2019) was utilized to recruit two intact classes of Chinese EFL learners from a second-tier comprehensive university in central China. The sample consisted of 58 Chinese postgraduate students in psychology who were enrolled in a second-year mandatory advanced English program. The entry-level English proficiency required to join this program was a College English Test 4 (CET-4) which is equivalent to an IELTS score of 6.0. The participants were randomly assigned to either an experimental group (e-tandem class) consisting of 30 learners or a control group (conventional class) consisting of 28 learners. The participants were non-English major learners with Mandarin Chinese as their first language, and their ages ranged from 22 to 32 years with a mean age of 25.6 years. The course aimed to improve the EFL learners' speaking skills, and none of the participants had prior experience using e-tandem for language learning. An experienced English instructor who was competent in technology use taught both the experimental and control classes.

In addition, the e-tandem (i.e., experimental) participants in this study comprised native and non-native English speakers from diverse regions worldwide who had a common objective of enhancing their English-speaking competencies or exchanging knowledge and cultural understanding with their e-tandem peers. This meant that the Chinese EFL students in the e-tandem group had the opportunity to participate in collaborative speaking tasks with their e-tandem partners, which facilitated the enhancement of their speaking abilities and understanding of their partners' first language and culture. Additionally, the Tandem application provided filters to select appropriate partners for collaborative speaking tasks according to the Chinese EFL learners' interests, ensuring that their e-tandem partners shared interests.

4.2. Instruments

The researcher used the IELTS speaking skill test to evaluate the Chinese EFL learners' speaking abilities. This test is comprised four equally weighted areas, namely fluency and coherence, vocabulary, grammatical range and accuracy, and pronunciation. The IELTS speaking test topics were used to evaluate the learners' performance in each area. The IELTS Speaking Band Descriptors were used to

assign a score from 1 to 9 to each learner in each area of speaking skill. These scores were added up and then divided by four to determine the global speaking score of each student. To ensure consistency, the learners' speaking skills were assessed by two trained raters, including the researcher and another experienced EFL speaking instructor. The inter-rater reliability was acceptable at 0.83, as measured by the Cohen's kappa coefficient.

The L2 WTC scale included eight items that were taken from Yashima (2009) and aimed to measure the participants' L2 WTC in real-life communication situations. These items were designed to prompt the participants to think about their willingness to communicate in various scenarios, such as when you have a group discussion in an English class. The items were rated on a six-point Likert scale, with responses ranging from 1 (definitely not willing) to 6 (definitely willing), and the even-numbered scale was used to prevent neutral responses.

Finally, to investigate the participants' perceptions and attitudes toward the overall process and its impact on their speaking skills, semi-structured interviews were carried out. After transcribing the interviews, the technique of member checking was used to validate the accuracy and credibility of the obtained results.

4.3. Data collection

For the pre-test, both the experimental and control groups of EFL learners were assessed using the Cambridge IELTS 9 speaking test. This test required the learners to speak about themselves and familiar topics for around 5 min, followed by a specific topic for which they were given 3 min to prepare notes. The learners were evaluated based on the IELTS Speaking Band Descriptors, which covered the four aspects of fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation. After the pre-test, both groups were exposed to speaking instruction which was tailored to enhance IELTS speaking competencies. The experimental group engaged in e-tandem exchanges for out-of-class speaking practice, while the control group had out-of-class speaking practice in a language lab.

The Chinese EFL students in the experimental group were introduced to the Tandem application through instructional videos and were given 10 days to find suitable language partners. This period served as a trial to familiarize themselves with the e-tandem method and the application. During each session, learners started with warm-up activities by discussing topics introduced in the coursebook with the researcher/instructor before collaborating on speaking tasks in groups of four or five. After class, the students were involved in collaborative speaking tasks with their foreign peers using the Tandem application, focusing on the same topics as the previous session. The selection of e-tandem partners was based on similar interests and a willingness to follow the learners' selected topics for group speaking tasks. These topics were already integrated into the Tandem application. The students used various communication modes, such as text messages, audio or video calls, and voice notes. Finally, the students were requested to think over their experiences of online exchanges and share their perceptions.

Similarly, the control group received the identical course materials and speaking instruction content as the e-tandem group but did not engage in telecollaboration tasks with foreign and native English speakers. Instead, they discussed the speaking topics with their

instructor and collaborated with their classmates during class time. After class, the conventional learners gave face-to-face presentations inside the classroom. To avoid exhaustion and accommodate time preferences, the presentation sessions were spread over several sessions per week, and participants were free to attend one or more sessions. Each presenter had a 15-min preparation time before their presentation, and their classmates provided feedback and comments on their performance.

4.4. Data analysis

In order to evaluate the effect of e-tandem and traditional speaking instruction on EFL learners' speaking skills and compare the effectiveness of these two methods, one-way ANCOVA was employed. The ANCOVA analysis was also used to investigate the impact of and compare the two types of instruction in affecting the learners' WTC. To control for any pre-existing differences between the two groups, learners' pre-test marks were considered as covariates. Thematic analysis was used to analyze the transcribed interviews. Inter-rater reliability was ensured by the researcher and two other

expert L2 researchers who checked the coding and labeling for accuracy and consistency. The disagreements among the researchers were discussed and resolved.

5. Results

5.1. Quantitative data

The first step in analyzing the data was to use descriptive statistics to compare the mean scores of the EFL learners' speaking skills in both the experimental and control classes before and after the study. Table 1 displays the results of these descriptive statistics, which show some differences in the mean scores for fluency between the pre- and post-tests for both groups. Additional statistical analyses, such as paired samples t-tests and one-way ANCOVA, were conducted to determine if these differences were significant. The paired samples t-tests were used to compare the pre- and post-test mean scores for each group.

The results displayed in Table 2 suggest that there were substantial changes in the EFL learners' speaking skills between their pre- and post-test scores in the experimental group, indicating that e-tandem had a significant impact on enhancing their speaking abilities. For example, the difference between the pre-test mean score of fluency and the post-test mean score of fluency was −0.92, which represents a significant improvement in the EFL learners' fluency, as evidenced by the value of p [t (29) = −4.82, p = 0.00]. Paired samples t-tests were also used to determine the distinctions between the pre- and post-test mean scores of the control group learners. As seen in Table 2, the outcomes of paired samples t-tests indicates that the traditional instruction was useful in boosting the EFL learners' speaking skills. Then, to compare the two groups' improvements in speaking skills, ANCOVA was conducted. Table 3 shows the results of ANCOVA that investigates the differences between e-tandem and control classes in boosting the EFL learners' fluency.

The findings presented in Table 3 suggest that there were significant disparities in the post-test scores of fluency skill between the experimental and control groups. This confirms that the experimental condition was more efficient in enhancing the EFL learners' fluency skills than the traditional instruction. Additionally, Table 4 displays the outcomes of the ANCOVA conducted to compare the two groups' effectiveness in enhancing vocabulary skills. It indicates that the e-tandem significantly improved the EFL learners' vocabulary skills compared to the conventional group, as significant differences were observed in the post-test marks of vocabulary skills, even after controlling for pre-test scores. Likewise, Table 5 demonstrates the results of the ANCOVA, which was conducted to examine the disparities between the two groups in improving accuracy skills.

Table 5 shows that significant differences were observed between the experimental and control classes in terms of accuracy skill improvement. This indicates that the experimental treatment was more useful in fostering the EFL learners' accuracy than the traditional instruction.

Table 6 illustrates the ANCOVA results, which examined the differences between the experimental and control classes' pronunciation skill. The findings indicate that the treatment was substantially effective in enhancing the EFL learners' pronunciation skills.

TABLE 1 Descriptive statistics.

	Group	N	Mean	Std. deviation
Fluency 1	Experimental	30	4.9933	0.56569
	Control	28	5.1250	0.60965
Fluency 2	Experimental	30	5.9200	1.04240
	Control	28	5.3304	0.83961
Vocabulary 1	Experimental	30	4.5550	0.62330
	Control	28	4.6471	0.60578
Vocabulary 2	Experimental	30	5.9517	0.98139
	Control	28	5.1007	0.69224
Accuracy 1	Experimental	30	5.5630	0.72776
	Control	28	5.3364	0.74961
Accuracy 2	Experimental	30	6.5567	0.83364
	Control	28	5.6786	0.78733
Pronunciation 1	Experimental	30	4.7020	1.21316
	Control	28	4.4389	0.65566
Pronunciation 2	Experimental	30	6.5433	0.87600
	Control	28	5.5768	0.77573
Global speaking 1	Experimental	30	4.1071	0.35068
	Control	28	4.0931	0.28632
Global speaking 2	Experimental	30	5.9428	0.59399
	Control	28	5.4804	0.48586
WTC 1	Experimental	30	3.0733	0.59766
	Control	28	2.8714	0.67651
WTC 2	Experimental	30	4.2567	1.14038
	Control	28	3.5125	0.79810

TABLE 2 Paired samples *t*-test results.

Group			Mean	SD	*t*	Df	*Sig.*
Experimental	Pair 1	Fluency	−0.92667	1.05238	−4.823	29	0.000
	Pair 2	Vocabulary	−1.39667	0.83166	−9.198	29	0.000
	Pair 3	Accuracy	−0.99367	0.52893	−10.290	29	0.000
	Pair 4	Pronunciation	−1.84133	1.69624	−5.946	29	0.000
	Pair 5	WTC	−1.18333	1.02051	−6.351	29	0.000
	Pair 6	Global Speaking	−1.83571	0.44085	−22.807	29	0.000
Control	Pair 1	Fluency	−0.20536	0.44369	−2.449	27	0.021
	Pair 2	Vocabulary	−0.45357	0.32978	−7.278	27	0.000
	Pair 3	Accuracy	−0.34214	0.27087	−6.684	27	0.000
	Pair 4	Pronunciation	−1.13786	1.05675	−5.698	27	0.000
	Pair 5	WTC	−0.64107	0.58989	−5.751	27	0.000
	Pair 6	Global Speaking	−1.38730	0.30824	−23.815	27	0.000

TABLE 3 ANCOVA results of fluency.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	18.646	2	9.323	13.883	0.000	0.335
Intercept	1.415	1	1.415	2.108	0.152	0.037
Fluency 1	13.610	1	13.610	20.267	0.000	0.269
Group	7.009	1	7.009	10.437	0.002	0.159
Error	36.935	55	0.672			
Total	1897.493	58				
Corrected total	55.580	57				

TABLE 4 ANCOVA results of vocabulary.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	28.491	2	14.245	34.265	0.000	0.555
Intercept	1.620	1	1.620	3.897	0.053	0.066
Vocabulary 1	18.003	1	18.003	43.304	0.000	0.441
Group	12.613	1	12.613	30.338	0.000	0.356
Error	22.866	55	0.416			
Total	1832.023	58				
Corrected total	51.356	57				

Table 7 further confirms the superiority of the experimental class over its traditional counterpart in improving the EFL learners' global speaking performance, as significant differences were observed between the two groups' post-test scores of total speaking performance after controlling for the covariates.

The researchers conducted quantitative statistical analyses to investigate the effect of experimental and traditional instructions on EFL learners' WTC. Descriptive statistics was utilized to examine the pre- and post-test mean scores of WTC scale in both groups, and the results are presented in Table 1. The table shows differences between the pre- and post-test mean scores of WTC in each group, as well as differences between the two groups' post-test mean scores of WTC. The researchers then performed paired samples *t*-tests to determine whether significant differences existed between the pre- and post-tests in each group. Table 2 presents the results of paired samples *t*-tests for the experimental group, indicating substantial changes in pre- and post-test marks of WTC, which suggest that the experimental program was effective in enhancing the learners' WTC. The researchers also conducted paired samples *t*-tests for the conventional group (see Table 2).

The results demonstrate that significant differences existed between the pre- and post-test scores of WTC among the control group learners, indicating that the traditional speaking instruction also played a vital role in improving the EFL learners' WTC. Nevertheless, to compare the two groups' WTC improvements, ANCOVA was conducted. The results of this analysis are presented in Table 8, which examines the differences between the experimental and control groups in improving the EFL learners' WTC. Table 8 shows that after controlling for the pre-tests as covariates, significant differences were found between the two groups' post-test marks of WTC, demonstrating that the experimental instruction was more useful than the conventional instruction in enhancing the EFL learners' WTC.

5.2. Qualitative data

In the qualitative phase of this research, the purpose was to explore the perceptions of participants of the experimental group toward e-tandem. Thematic analysis was used to identify recurring patterns and themes in the data. The following themes were identified:

5.2.1. Comfort and confidence

Participants spoke about their initial hesitancy and lack of confidence in using video chat to practice their speaking skills. However, over time, they began to feel more comfortable and confident in their abilities. For example, one participant said, "At first, I was hesitant to use video chat because I wasn't confident in my speaking skills. However, after some time, I started feeling more comfortable and it became easier for me to have a conversation with my partner."

5.2.2. Correction and technical difficulties

The experimental group students appreciated the correction function on the app as it helped them understand their mistakes and learn from them. Nevertheless, some technical difficulties with the photo uploading option were reported. For example, one participant said, "I appreciated the correction function on the app because it helped me understand my mistakes and learn from them. However, there were some technical difficulties with the photo uploading option."

5.2.3. Finding suitable partners

Some students reported that finding a suitable tandem partner who was dedicated to learning the language was challenging. Some people seemed to be more interested in flirting than actually practicing the language. For example, one participant said, "It was challenging to find a suitable tandem partner who was dedicated to learning the language. Some people seemed to be more interested in flirting than actually practicing the language."

TABLE 5 ANCOVA results of accuracy.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	38.078	2	19.039	104.922	0.000	0.792
Intercept	1.013	1	1.013	5.580	0.022	0.092
Accuracy 1	26.911	1	26.911	148.303	0.000	0.729
Group	6.260	1	6.260	34.496	0.000	0.385
Error	9.980	55	0.181			
Total	2229.480	58				
Corrected total	48.058	57				

5.2.4. Colloquial expressions and motivation

EFL students found it difficult to understand some of the colloquial expressions used by their partners at first. However, this motivated them to improve their listening and speaking skills in order to communicate better with their partners. For example, one participant said, "I found it difficult to understand some of the colloquial expressions used by my partners at first. However, this motivated me to improve my listening and speaking skills in order to communicate better with them."

5.2.5. Enjoyment and motivation

Also, students reported that they enjoyed talking with some partners more than others. This made them more motivated to practice their speaking and to prepare for their next conversation. For example, one participant said, "I enjoyed talking with some partners more than others. It made me more motivated to practice my speaking and to prepare for our next conversation."

5.2.6. Personal boundaries

Few students also reported that some people asked personal questions that they did not feel comfortable answering. This made them realize the importance of setting boundaries in language exchanges. For example, one participant said, "There were some people who asked personal questions that I did not feel comfortable answering. It made me realize the importance of setting boundaries in language exchanges."

5.2.7. Different dialects and accents

The participants reported that they noticed some of their partners from the Middle East used very formal language that was different from what they were used to hearing. It was interesting to learn about the different dialects and accents of English. For example, one participant said, "I noticed that some of my partners from the Middle East used very formal language that was different from what I was used to hearing. It was interesting to learn about the different dialects and accents of English."

5.2.8. Tandem as a supplement

Additionally, a number of participants reported that while they preferred more traditional classroom settings, Tandem was a useful supplement to their language learning. It allowed them to practice speaking and connect with people from around the world. For example, one participant said, "I prefer more traditional classroom settings, but I found Tandem to be a useful supplement to my language

TABLE 6 ANCOVA results of pronunciation.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	15.523	2	7.761	11.693	0.000	0.298
Intercept	119.649	1	119.649	180.252	0.000	0.766
Pronunciation 1	1.993	1	1.993	3.002	0.089	0.052
Group	14.706	1	14.706	22.155	0.000	0.287
Error	36.508	55	0.664			
Total	2193.773	58				
Corrected total	52.031	57				

TABLE 7 ANCOVA results of global speaking.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	11.799	2	5.899	41.052	0.000	0.599
Intercept	0.158	1	0.158	1.102	0.298	0.020
Global1	8.702	1	8.702	60.556	0.000	0.524
Group	2.870	1	2.870	19.969	0.000	0.266
Error	7.904	55	0.144			
Total	1917.112	58				
Corrected total	19.702	57				

TABLE 8 ANCOVA results of WTC.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	23.938	2	11.969	16.882	0.000	0.380
Intercept	4.801	1	4.801	6.771	0.012	0.110
WTC 1	15.918	1	15.918	22.451	0.000	0.290
Group	4.670	1	4.670	6.586	0.013	0.107
Error	38.994	55	0.709			
Total	943.942	58				
Corrected total	62.932	57				

learning. It allowed me to practice speaking and connect with people from around the world."

6. Discussion

Drawing on Vygotsky's (1984) social constructivism of learning, the present study investigated the impact of using online language exchanges via e-tandem on the speaking performance and willingness to communicate of EFL students. The findings indicated that e-tandem class enhanced the speaking performance of EFL students and outperformed its conventional counterparts in that regard. The findings are in line with those of Canals (2020) and Rahimi and Fathi (2022) who confirmed the positive impact of e-tandem language learning programs on EFL students' speaking performance. The findings might be due to the effect of the foreign speakers of English which, as a new experience, motivated the e-tandem learners to have more engaging communicative speaking activities with their online partners and enhance their speaking abilities accordingly. The online experience of the e-tandem class also engaged the learners of the e-tandem class to communicate with their partners whenever and wherever they thought was convenient for them, which could have a positive impact on their speaking performance.

Following Vygotsky's (1984) social constructivism of learning, the learners' speaking abilities in the e-tandem class were mediated by

their online partners. Initially, the learners had communicative speaking activities with their online partners in an interactive manner which, according to Vygotsky (1984), could help them regulate their own speaking abilities and those of their partners. The learners' other-regulation via the interactive speaking activities gradually contributed to the learners' self-regulation of speaking abilities. The learners who achieved their self-regulation could act autonomously and perform their speaking tasks without the contribution of other learners. The findings drew on the fact that the e-tandem learners were more successful than the conventional learners in achieving their self-regulation of speaking performance.

In harmony with the findings of Liu et al. (2023), the aforementioned findings might be also due to the cultural elements the learners acquired during their communicative speaking interactions with their online foreign speakers of English. As the learners and their online partners had different cultural backgrounds, they could share their cultural knowledge with their partners which was thought to be engaging for the learners. The enthusiasm for learning new cultural elements could also contribute to the e-tandem learners' speaking performance. The e-tandem learners' successful internalization of cultural elements might be another reason behind the e-tandem learners' more successful speaking performance.

The findings further revealed that the e-tandem program improved the learners' willingness to communicate and outperformed its conventional counterpart. The findings are in agreement with the findings of Rahimi and Fathi (2022) who corroborated the beneficial effects of the e-tandem program in enhancing EFL learners' willingness to communicate. E-tandem learners were more willing to communicate and utilize the target language in real-world situations and develop their speaking skills. E-tandem learners were also more open to participating in communicative speaking tasks and would communicate outside of the classroom with their online partners, which could significantly contribute to their speaking performance and willingness to communicate. Moreover, the e-tandem learners were willing to communicate and achieve their autonomy in speaking tasks, which could corroborate their more successful performance in linguistic skills and pursue their language learning goals.

The findings may be also the result of the students' stronger drive to have interactive speaking activities via e-tandem language learning model and their perception that working in an e-tandem program was far more motivating than working alongside their classmates during class time. Rahimi and Fathi (2022), among other studies, indicated that these kinds of interactions affected motivation and WTC with native speakers. Therefore, interacting with native speakers seems to have the benefit of increasing learners' motivation to communicate and work interactively (Garcia and Appel, 2016). When students perceive a genuine need for communication, they are much more likely to be willing to engage in it and view the activities assigned to them to be more interesting (Kobayashi, 2021). The dual positions that each student assumed—as both a learner and an expert—could also have a favorable impact on their speaking performance and willingness to communicate. That is, although the learners learned different English language items from their online partners, they taught their online partners about the rules and items of their own native language, which further motivated the learners to have more engaging interactive speaking activities with their online partners.

It is suggested that implementing an e-tandem program can engage students in a comfortable online space where they can interact with English speakers all over the world and increase their speaking ability and willingness to converse more successfully. According to the present study, EFL students actively participate in interactive speaking activities with their online partners, which improves their speaking abilities and willingness to communicate more properly. It is thought that these collaborative speaking activities help learners develop their ability to self-regulate their speaking and communication behaviors. According to Vygotsky (1986), learners with various aptitudes and talents can aid one another in reaching their optimal level of functioning. In the present study, the online course assisted the students in having more successful engaging communicative speaking tasks (other-regulation) by enhancing favorable impressions of their online members' cultures and skills (Liu et al., 2023) for cooperative and comprehension reasons. This is in line with Rahimi and Fathi's (2022) findings. Because the participants in the current study had a variety of cultural backgrounds, they were able to significantly improve their partners' cultural self-regulation, and hence, their speaking performance and willingness to communicate.

The findings of the qualitative data analysis suggest that online language exchanges revealed the benefits and challenges of using e-tandem for language learning. One of the major benefits identified was the increase in confidence and comfort levels of the participants in speaking the target language. Participants reported that, although they were initially hesitant, the experience of using e-tandem helped them to overcome their fear of making mistakes and gain confidence in their language abilities. This finding is consistent with previous research that has shown the importance of creating a supportive environment for language learners to practice their skills without fear of judgment (Shih, 2010; Wang and Vásquez, 2012; Yousefifard and Fathi, 2021).

Another benefit highlighted was the opportunity to practice with native speakers, which allowed participants to improve their pronunciation and vocabulary in a more authentic context. The use of colloquial expressions by partners also presented a challenge for participants, but motivated them to improve their listening and speaking skills to better communicate with their partners. The present study's identification of the opportunity to practice with native speakers aligns with previous research that has shown that interactions with native speakers via technology can provide learners with valuable opportunities to improve their language skills (Yeh and Lai, 2019; Mumford and Dikilitaş, 2020; Russell, 2020). Similarly, Marull and Kumar (2020) also reported that online language exchanges provided opportunities for learners to practice authentic language in real-life situations. However, the study also identified some challenges associated with the use of e-tandem for language learning. One such challenge was the difficulty in finding suitable tandem partners who were dedicated to learning the language. Some participants reported encountering partners who were more interested in flirting than language practice. This highlights the importance of setting clear boundaries and expectations for language exchanges. The identification of the importance of setting clear boundaries and expectations for language exchanges aligns with previous research that emphasizes the significance of establishing clear goals and expectations for language exchange programs to ensure their effectiveness (Sevy-Biloon and Chroman, 2019; Yeh and Heng, 2022).

Another challenge identified was the technical difficulties that some participants faced while using the app, such as problems with photo uploading. This suggests the need for continuous improvement of the technological features of e-tandem to enhance the user experience. This finding supports previous research that underscored the significance of ensuring the usability of language learning technologies to enhance the user experience (Fernández-López et al., 2013; Chen et al., 2021). Overall, the findings suggest that e-tandem can be a useful supplement to traditional classroom methods for language learning, providing learners with opportunities to practice speaking and connect with people from around the world. However, the challenges identified in this study emphasize the need for careful consideration of the design and implementation of e-tandem programs to ensure their effectiveness and usability for language learners.

7. Conclusions and implications

The current research aimed to investigate the impact of online language exchanges on the speaking skills and WTC of Chinese EFL learners. The researcher concentrated on an e-tandem language learning program which was designed to help EFL learners improve their speaking performance and willingness to communicate. Following Vygotsky's social constructivism, the findings indicated that the e-tandem class was more effective in improving the EFL learners' speaking performance and willingness to communicate than the conventional class.

The study's findings showed that the e-tandem class had a beneficial impact on the students' speaking abilities and willingness to communicative. The results may be directly related to the students' interactions with online foreign English speakers, which they perceived as being more enthusiastic than in-person speaking learner interactions. The results suggested several instructional implications. It is advised to use the e-tandem class in EFL interactive speaking courses since it is consistent with contemporary notions of student-centeredness and produces positive results for EFL students' speaking performance and willingness to communicate. According to the research, EFL educators should encourage EFL teachers and students to apply an e-tandem program for interactive speaking activities so that the EFL students' speaking abilities and willingness to communicate can be enhanced.

It is suggested that EFL teachers create an e-tandem class to give EFL students interesting interactive speaking activities with online foreign English speakers. This allows EFL students to engage in more cooperative and interpretive communicative speaking tasks in order to enhance their speaking ability and their willingness to communicate more effectively. EFL students could have and get more peer speaking mediations on the speaking assignments by having an e-tandem classroom designed specifically for interactive speaking activities. The students can also make greater use of engaging communicative speaking tasks, improve their speaking performance, and increase their willingness to communicate as a result. Given the importance of oral communication in English, this finding is particularly relevant in the Chinese context, where many students struggle with spoken English due to a lack of opportunities for practice. Finally, the study highlights the need for EFL teachers to be trained in the use of technology-enhanced language learning. While the e-tandem learners had positive attitudes toward the technology, some

expressed reservations, and it is possible that these reservations may have affected their learning outcomes. EFL teachers in China may benefit from training in the use of technology-enhanced language learning, both to ensure that they can effectively integrate technology into their teaching and to address any concerns that students may have about the technology.

Despite the valuable insights obtained by this research, there might be some limitations which need to be taken into account while interpreting the outcomes. Firstly, the present sample size was relatively small, consisting of only postgraduate students in one university. As such, it is less likely to extend the findings to other EFL learners in various settings. Secondly, this research only concentrated on the effect of online language exchanges on speaking skills and WTC. Future researchers might explore the impact on other language skills, such as listening, reading, and writing, and other affective constructs that may influence language learning, such as motivation and anxiety. Additionally, the study did not consider the impact of cultural differences and their potential impact on the success of online language exchanges. Finally, future researchers can also explore the impact of various online language exchange programs and applications on language learning outcomes to identify the most effective tools and strategies for facilitating language learning through online exchanges.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation. Requests to access these datasets should be directed to AZ, 20041029@zzut.edu.cn.

Ethics statement

The studies involving human participants were reviewed and approved by School of Foreign Languages, Zhengzhou University of Technology, Zhengzhou, Henan. The patients/participants provided their written informed consent to participate in this study.

Author contributions

AZ has completed the project and is the sole contributor.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Development and validation of the social media perception scale for preservice physical education teachers

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Background: Social media has become a mainstay of preservice physical education teachers' professional development. However, previous studies have been dominated by qualitative research, and there is still a lack of quantitative research based on samples from eastern countries. The objective of this study is to develop and validate of the Social Media Perception Scale for Preservice Physical Education teachers (SMPS-PPE).

Method: Items of questionnaire created from 70 concepts of the perception model described in our previous study. Questionnaire survey was used to collect quantitative data from a sample of 977 preservice physical education teachers through surveys. We analyzed the data using SPSS 26.0 and AMOS 24.0, conducting item analysis, exploratory factor analysis and confirmatory factor analysis to examine the data.

Results: SMPS-PPE consists of 26 items grouped into three factors: value perception, risk perception, and overall perception. Our findings indicate that SMPS-PPE has acceptable content validity, internal structure validity, and internal consistency.

Conclusion: SMPS-PPE is a reliable and valid measurement to evaluate social media perception among preservice physical education teachers. Future studies should include larger and more diverse teacher samples to enhance generalizability. The SMPS-PPE should also be modified to better cater to the specific requirements of school teachers and university-based teacher educators in the field of physical education.

KEYWORDS

preservice physical education teachers, social media, perception, scale development, exploratory factor analysis, confirmatory factor analysis

1. Introduction

Social media has emerged as a prevalent and widely used form of new media, embraced by youth demographic. As for the youngest cohort of physical education teachers, preservice physical education teachers, who possess an insatiable curiosity but lack teaching guidance and experience, social media presents a double-edged sword of opportunities and challenges.

On one hand, social media offers various benefits such as free access to professional knowledge, skills, and opinions, serving as a primary source for news retrieval, and providing avenues for global communication. As a result, social media has become an essential tool for professional development among physical education teachers (Carpenter and Harvey, 2020a). On the other hand, the prevalence of social media has introduced new challenges in managing and processing health-related information in physical education. Filter failure is a significant challenge for preservice physical education teachers who struggle to sort out irrelevant information from social media feeds, resulting in information overload and feelings of being overwhelmed (Hobbs, 1997; Ong and Cabañes, 2018). This, in turn, contributes to technostress and other media disorders such as anxiety, depression, headaches, and eye strain, potentially hindering the professional development of preservice physical education teachers (Ong et al., 2019; Lanuza, 2020; Lanuza and Arguelles, 2022; Ong and Tapsell, 2022). In addition, media disorders such as addiction, misinformation, and echo chambers can be detrimental to individuals and society as a whole (Hobbs, 1997, 2010, 2018). Additionally, the use of manipulative algorithms in social media has led to the proliferation of networked propaganda, sustained by online communities and reinforced through a powerful feedback loop between mainstream media, politicians, and internet subcultures. This networked propaganda is distributed through a wide range of outlets, both controlled by propagandists and independent, and is characterized by its ability to assume the properties of credible sources. Deeply, the use of these algorithms to distribute and receive news has led to a sense of cynicism toward media and has made it challenging to adopt a consistently truth-focused strategy without being expelled from the network and losing influence in relevant segments of the public (Mihailidis and Cohen, 2013; Mihailidis and Foster, 2021). Moreover, the growing prevalence of fake news on social media is a concern, especially in fields such as physical education and health (Goodyear et al., 2019). Hence, the dissemination of false information through social media can harm the reputation and credibility of preservice physical education teachers and have a negative impact on their professional standing. To overcome these challenges, preservice physical education teachers must be aware of the consequences of fake news and use social media responsibly and knowledgeably to ensure effective professional development.

The potential influence of preservice physical education teachers' perception of social media has on their involvement in social media usage as a professional learning tool in new era. Thus, it is essential for developing and verifying a effective tool of social media perception among preservice physical education teachers. Several studies have explored the perception of social media among physical education teachers to address the issues faced by preservice physical education teachers. Most of these studies have used a qualitative approach. For example, Goodyear et al. (2019) explored the characteristics of #pechat, a Twitter-based professional learning community used by physical education teachers to engage with each other and share practices (Goodyear et al., 2019). The researchers found that #pechat is a representative example of an established group of practitioners who use social media for professional development. McNamara et al. (2021) focused on communication and learning processes in physical education teachers and found that physical education teachers were more likely to engage in communication through learning activities such as exchanging knowledge, networking, posting or viewing

motivational content, and learning about employment opportunities (McNamara et al., 2021). Hyndman and Harvey (2019) determined pre-service teachers' perceptions of the potential of using Twitter within Health and Physical Education Teacher Education training. They found that values such as facilitating learning, technology engagement, capturing international insight, enhancing collaboration and communication, were perceived. However, some barriers such as receiving adequate training, privacy, excessive technology use, and determining Twitter's functionality and application across educational contexts were identified (Hyndman and Harvey, 2019). Hyndman and Harvey (2020) investigated preservice teachers' perceptions of the value of using Twitter for health and physical education teacher education. They found that physical education teachers valued autonomy, relatedness, and competence. However, there were also concerns due to Twitter's public exposure to undesired Twitter users and how to navigate the platform (Hyndman and Harvey, 2020). Carpenter and Harvey (2020b) compared and contrasted the previous findings related to social media usage among physical education teachers. They suggested that current research informs the wise use and non-use of social media for professional development and learning by those involved in the field of physical education and sport pedagogy. The research illustrates the positives, negatives, and tensions associated with social media use for professional development and learning (Carpenter and Harvey, 2020a).

While there has been a considerable amount of research exploring the perception of social media among physical education teachers, little attention has been given to examining this topic within Eastern countries. To address this gap, Xu et al. (2023) conducted research focused on one of the largest Eastern countries with a significant number of physical education teacher education programs (Xu et al., 2023). While their study employed qualitative research methods, guided by the bottom-up grounded theory, it comprehensively explored the social media perception structure of pre-service physical education teachers and identified the basic elements of their social media perception. It should be noted that qualitative research is inherently more subjective than quantitative research and typically relies on a smaller participant pool. Though some studies used quantitative methods via questionnaire survey to investigate the use of social media (Popovic et al., 2021; Viana et al., 2021; Sari et al., 2022), but the objectives of preservice physical education teachers and eastern samples are still under-research. As a result, it is essential to conduct further objective quantitative research to validate and refine a scientific evaluation scale for assessing social media perception among pre-service physical education teachers. This tool would serve as a reliable and practical means of universally evaluating pre-service physical education teachers' social media perception levels in the future. Moreover, the development and implementation of this tool could enhance the methodology for comprehending and addressing pre-service physical education teachers' social media perceptions.

To address the lack of validated instruments that can scientifically explain the complexity of social media perception among preservice physical education teachers, this study is to develop and validate the Social Media Perception Scale for Preservice Physical Education Teachers (SMPS-PPE). We created a questionnaire survey based on the previously constructed social media perception model (Xu et al., 2023) and administered it to 977 preservice physical education teachers in China to assess the reliability and validity of the scale. SMPS-PPE developed and described here has the potential to

contribute to methodology for understanding and addressing perceptions of social media for preservice physical education teachers engaged with technology change for improvement in future practice.

2. Methods

2.1. Item generation

The Convergence model (Creswell and Clark, 2017) was employed in this study to analyze both qualitative and quantitative data. By triangulating the findings, a more comprehensive understanding of the research questions was obtained. The qualitative phase of the study, which provided rich data for analysis, has already been published in Xu et al. (2023). The quantitative phase will validate the findings and offer insight into the perception of social media among preservice physical education teachers, as outlined below:

Xu et al. (2023) conceptualized social media perception model for preservice physical education teachers (Xu et al., 2023). It clearly defined 70 concepts that Social Media Perception Scale for Preservice Physical Education teachers (SMPS-PPE) scale is intended to measure. Xu et al. (2023) involved conducting a thorough review of the existing literature, consulting with experts in the field, collecting online posts and conducting semi-structured interviews with preservice physical education teachers. Specifically, Xu's study utilized a mixed methods approach to gather data from various sources. To begin with, a comprehensive literature search was conducted using both domestic and international databases including CNKI (China National Knowledge Infrastructure) and Web of Science. The objective of this search was to collect information on the perception model of social media among pre-service physical education teachers. A total of 48 relevant articles in Chinese and 203 in English were obtained and analyzed to extract initial concepts and support the theoretical framework proposed in the study. In addition, social media posts related to physical education, such as those under hashtags #pechat and #pe, were gathered from popular social media platforms such as WeChat, Twitter, and TikTok. Finally, semi-structured interviews were conducted with 17 pre-service physical education teachers to gain a deeper understanding of their views and experiences regarding the use of social media in their profession. It suggested that reliability for generating items of SMPS-PPE. Hence, these 70 concepts used for the Pretest version of the SMPS-PPE construction, details can be found in Table 1.

2.2. Participants and procedure

As previously mentioned, we developed the Pre-test version of SMPS-PPE, which includes 70 items and six basic information items (gender, ethnicity, geography, grades, type of university, and level of university). The SMPS-PPE was scored using a 5-point Likert scale, which is common in the research of social media perception (Bicen and Uzunboylu, 2013; Caliskan et al., 2018; Yildiz, 2019). All 70 items scored on a five-point Likert scale: 1 = "strongly disagree," 2 = "disagree," 3 = "undecided," 4 = "agree," 5 = "strongly agree." The higher the score, the higher the level of social media perception from preservice physical education teachers or the stronger the importance of influencing factors. And the SMPS-PPE was administered through

Sojump,[1] a professional online survey platform widely used in China (Zhang et al., 2017; Mei and Brown, 2018). To ensure the reliability of the returned SMPS-PPE, the system recorded the commit time, completion time, IP address, and city of respondents.

To ensure the face validity of items, we followed a similar procedure as in the initial study (McNamara et al., 2022). From August 2021 through September 2021, We distributed a draft of the items of SMPS-PPE to 78 undergraduate students majoring in physical education at East China Normal University (ECNU) and requested their feedback regarding the items, such as suggestions for minor alterations in wording and sentence structure and checking for redundancy. All 70 items were then reviewed, revised, and compiled based on their feedback.

To test the internal structural validity of SMPS-PPE, we followed the recommendations of Costello and Osborne (2005) and utilized three different samples: one for item analysis, another for exploratory factor analysis (EFA), and a third for confirmatory factor analysis (CFA) (Costello and Osborne, 2005), see below for details:

Firstly, we generated the Pre-test version of SMPS-PPE, consisting of 70 items. From October 2021 through November 2021, we distributed this Pre-test version of SMPS-PPE to a sample of 114 Chinese preservice physical education teachers. This sample used for the item analysis. Table 2 provides further details regarding this sample.

Next, we created a Beta version of the SMPS-PPE based on the data analysis of the Pre-test version. Different samples were collected to perform exploratory factor analysis (EFA). Participants were recruited using the same procedures described above, and the samples were collected at two different time periods using different internet links. From December 2021 through January 2022, we then distributed this Beta version of the SMPS-PPE to a sample of 429 Chinese preservice physical education teachers, as shown in Table 3.

Finally, we administered the final version of the SMPS-PPE, consisting of 26 items. Similarly, from February 2022 through March 2022, we then distributed this final version of the SMPS-PPE to a sample of 434 Chinese preservice physical education teachers. The samples were collected to perform confirmatory factor analysis (CFA). Participants were recruited using the same procedures described above, and the samples were collected at different time periods using different internet links. Please refer to Table 4 for further details regarding this sample.

2.3. Measures and statistical analyze

In the first stage, to assess the appropriateness, feasibility, and relevance of the scale items to the intended constructs, we performed an item analysis on the first sample ($N = 114$). We utilized the Critical Ratio method to determine the deletion of items based on the achievement of the critical value, along with homogeneity tests and correlation analysis. Since the SMPS-PPE was scored on a five-point Likert scale, it is standard practice to use the Critical Ratio method and correlation analysis to conduct item analysis (Bryant and Yarnold, 1995).

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1 www.wjx.cn

TABLE 1 t-test for high and low grouping of each item in SMPS-PPE (Pre-test version) (N=114).

Items	t	p
1. I find the graphic videos related to sports or teaching practices in social media smooth and clear	3.386	0.001**
2. I think there is a lack of communication boards for issues related to physical education	3.822	0.000**
3. I think pre-service physical education teachers are happy to share or exchange motor knowledge skills in social media	4.560	0.000**
4. I find it difficult to screen the authenticity of basic sports theory or specific sports data in social media	2.507	0.015*
5. I believe that pre-service physical education teachers can demonstrate strong professional ethics in their interactions with users	4.213	0.000**
6. I feel that the information on sports skills practice and sports theory is too fragmented	2.249	0.029*
7. I think that physical education students and teachers are using social media	4.121	0.000**
8. I feel that pre-service physical education teachers who lack teaching experience are prone to misunderstandings or arguments during the sharing process	4.139	0.000**
9. I feel that there is a lack of authoritative sources of information such as frontline physical education teachers, sports research experts and official sports bodies	0.449	0.655
10. I feel that the division between motor skills and sport theory in social media is unclear	2.843	0.006**
11. I think that in the future, all social media will be interconnected to make it easier to access physical education resources	2.853	0.006**
12. I feel that social media resources for physical education widen the only access to knowledge and skills for pre-service physical education teachers	4.088	0.000**
13. I feel that for pre-service physical education teachers the typographic interface of social media is clean and clear	3.588	0.001**
14. I feel that social media has freed pre-service physical education teachers from the constraints of uniform offline teaching content and pace	5.564	0.000**
15. I feel that social media will encourage the sharing of knowledge on sports, health and nutrition, fitness skills in the future	4.217	0.000**
16. I found that pre-service physical education teachers were more proactive in engaging in discussions on physical education topics in an anonymous setting	3.309	0.002**
17. The limited camera angles of live or recorded video may affect the learning of technical movements	4.357	0.000**
18. I think the future of online sports courses in social media will be more systematic and complete	4.516	0.000**
19. I feel that in the future there will be more and more clear categories of knowledge about sports skills practice and sports theory	4.053	0.000**
20. I found the video clips and other applications needed to share motor skills very easy to use	2.568	0.013*
21. I think the video replay and the speed change feature make the dynamics of the techniques and tactics of each event easier to understand	4.319	0.000**
22. I am concerned that my personal information can be easily compromised or stolen	3.990	0.000**
23. I believe that most of the latest sports information and statistics available on social media are true and reliable	3.407	0.001**
24. I feel that the intelligent pushing of sports information meets the needs of pre-service physical education teachers for learning about different sports specialties	5.991	0.000**
25. I think that the vehicles of picture, sound and text are very suitable for the overall development of the professional knowledge of pre-service physical education teachers	4.733	0.000**
26. I feel that social media enables pre-service physical education teachers to communicate across school and classroom boundaries	6.819	0.000**
27. I believe that resources in social media can meet the needs of pre-service physical education teachers at different levels	4.888	0.000**
28. I feel that the language translation function has helped pre-service physical education teachers to connect internationally	4.115	0.000**
29. I think it's time consuming to find the right sports resources in a social media world where resources are confusingly categorized	2.824	0.007**
30. I feel that social media provides a database of physical education information that pre-service physical education teachers need	5.695	0.000**
31. I believe that sport resources in social media enable pre-service physical education teachers to connect their daily lives with sport	6.597	0.000**
32. I feel that intelligent push content can inspire me about physical education (e.g., health education perspectives)	5.707	0.000**
33. I find that social media makes it easy for me to collaborate and communicate with in-service physical education teachers	5.125	0.000**
34. I feel that there was a lively atmosphere of discussion about motor skills in the virtual community, topic discussions and other divisions	6.710	0.000**
35. I feel that it is easy to retrieve and collect sports information in social media	5.790	0.000**
36. I feel that paid sports resources in social media are affordable	6.669	0.000**
37. I feel that sports videos, graphics, etc. are very suitable for pre-service PE teachers to build sport representations	6.913	0.000**
38. I feel it is difficult to receive timely responses from high level physical education teachers or research experts in social media	4.585	0.000**
39. I feel that social media has made it easy for pre-service PE teachers to collaborate on interdisciplinary communication	4.834	0.000**
40. I am worried that my fellow students and teachers on campus will misunderstand or make fun of what I post on social media	5.206	0.000**

(Continued)

TABLE 1 (Continued)

Items	t	p
41. I find physical education resources through social media helpful in reinforcing what I have learned in class	5.745	0.000**
42. I feel that most of the technical aspects of physical education related sharing in social media are not clearly presented	4.598	0.000**
43. I think social media can help break down the unequal distribution of resources for physical education	7.246	0.000**
44. I find that there are many users in social media who are interested in exercise and fitness	3.969	0.000**
45. I feel that the different scales of interaction met the different communication needs of pre-service physical education teachers	6.913	0.000**
46. I feel that the effectiveness of learning in social media is vulnerable to offline noise or other distractions	6.490	0.000**
47. I feel that social media lacks a screening mechanism for outdated poor quality and fraudulent sports information	7.048	0.000**
48. I feel that there are many authoritative physical education experts in social media	5.803	0.000**
49. I feel that most sports knowledge skills in social media are not very credible	3.222	0.002**
50. I feel that funny emojis in social media meet the social and entertainment needs of pre-service physical education teachers	3.600	0.001**
51. I feel that the resources in social media can serve pre-service physical education teachers' understanding and practice of the details of skill movements	5.701	0.000**
52. I am concerned that pre-service physical education teachers do not have the quality of self-discipline to concentrate on learning about physical education in social media	2.110	0.040*
53. I feel that positive physical activity messages can ignite my enthusiasm for extracurricular exercise	7.898	0.000**
54. I feel that most of the active sports users are motivated by the intention of selling skills courses or nutritional supplements, etc.	2.799	0.007**
55. I think the vivid and colorful interface matches the esthetics of all pre-service physical education teachers	4.418	0.000**
56. I feel that social media has integrated the information resources I need for my major	4.554	0.000**
57. I feel that the capabilities of social media can support multiple perspectives on the endless appeal of sport	8.497	0.000**
58. I think social media can provide me with scientific and effective exercise training programs	5.244	0.000**
59. I think pre-service physical education teachers have access to a lot of information content outside the classroom	6.837	0.000**
60. I found conflicting explanations of physical skills training methods in different sports social media	3.698	0.001**
61. I am concerned that asking for unsolicited professional information related to physical education may be perceived as an invasion of privacy	2.497	0.016*
62. I feel that other users in social media are friendly toward pre-service physical education teachers	2.246	0.029*
63. The information on social media about non-sports professions makes me feel a big cultural difference	2.534	0.014*
64. I feel that the size of the online user base of physical education teachers and related practitioners is large	8.749	0.000**
65. I feel that the knowledge and skills acquired are only applicable to non-physical education majors who are physical education enthusiasts	3.756	0.000**
66. I found the exchange of physical education type topics carried out by pre-service physical education teachers to be sincere and in-depth	4.441	0.000**
67. Seeing my classmates follow, bookmark and retweet the key points of physical education makes me feel very stressed	5.377	0.000**
68. I believe that social media has solved the learning and training paradox faced by many pre-service physical education teachers	7.400	0.000**
69. I feel that the novelty of motor skills in social media is more engaging than offline classes	4.797	0.000**
70. I feel that the large number of categories of information makes it difficult to focus on content relevant to the subject	3.755	0.000**

*indicates $p < 0.05$; **indicates $p < 0.01$.

In the second stage, to statistically determine the number of factors and items that should be retained in the SMPS-PPE, we conducted a series of EFAs on the second sample ($N = 429$). We used KMO value Bartlett's test and varimax rotation, as recommended for scale development by Kaiser (1974). Following Tabachnick and Fidell (2001), the KMO value 0.60 and higher value of KMO test is essential for good factor analysis (Tabachnick and Fidell, 2001). We then conducted a factor analysis to determine the number of factors (Matsunaga, 2010; Wu, 2010; Escobar-Viera et al., 2018), with the following criteria: (i) each item has a commonality of >0.40; (ii) each factor contained at least three items; (iii) items were consistent with factor meanings and difficult to combine with other items.

In the third stage, CFA has been recommended over the use of exploratory factor analysis as it provides a more rigorous method of examining construct validity by enabling comparisons of alternative *a priori* theoretical models (Kline, 1998). Before CFA, using the third sample ($N = 434$), we assessed the reliability and validity of the final version of the SMPS-PPE. Subsequently, we tested the three factors and the structural equation model of the SMPS-PPE that emerged from the EFA analyses through CFA using AMOS version 24.0 software. To determine an acceptable model fit, we assessed the following criteria: GFI, AGFI, IFI, NFI, TLI, and CFI above 0.90, while RMSEA <0.1 (Hu and Bentler, 1999; Schermelleh-Engel et al., 2003; Kline, 2013).

TABLE 2 Information of participants for item analysis by SMPS-PPE (Pre-test version) (*N*=114).

Variables	Content	Fre.	Percent (%)
Sex	Male	64	56.1
	Female	50	43.9
Ethnicity	Han	81	71.1
	Minority	33	28.9
Location	Eastern	34	29.8
	Middle	37	32.5
	Western	24	21.1
	North-Eastern	19	16.6
Grade	First	29	25.5
	Second	20	17.5
	Third	38	33.3
	Fourth	27	23.7
Type of university	Comprehensive University	44	38.6
	Normal College	29	25.4
	Sports College	41	36.0
Level of university	985	19	16.7
	211	22	19.3
	Key	34	29.8
	Average	39	34.2

TABLE 3 Information of participants for exploratory factor analysis (EFA) by SMPS-PPE (Beta version) (*N*=429).

Variables	Content	Fre.	Percent (%)
Sex	Male	287	66.9
	Female	142	33.1
Ethnicity	Han	314	73.2
	Minority	115	26.8
Location	Eastern	145	33.8
	Middle	115	26.8
	Western	69	16.1
	North-Eastern	100	23.3
Grade	First	113	26.4
	Second	126	29.4
	Third	141	32.9
	Fourth	49	11.3
Type of university	Comprehensive University	147	34.2
	Normal College	123	28.7
	Sports College	159	37.1
Level of university	985	114	26.6
	211	94	21.9
	Key	102	23.8
	Average	119	27.7

(1) According to the Classification Methods of Eastern, Central and Western Regions and Northeast Region released by the National Bureau of Statistics, the eastern region refers to Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; the central region refers to Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan; the western region refers to Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang; and the northeast region refers to Liaoning, Jilin, and Heilongjiang; (2) Universities in 985 and 211 are highly selective and competitive, and their graduates are highly sought after by employers in China and around the world. For the rank, 985 is better than 211, 211 is better than key, and the average. The same explanations as the tables of participants' information below.

3. Results

3.1. Item analysis

Critical Ratio Method. Using independent sample *t*-tests, the items of SMPS-PPE were divided into high (top 27% of total score) and low (bottom 27% of total score) groups to examine their relationship with the total score of the SMPS-PPE (Fan, 1954). Based on the criteria for significant differences, items that did not meet the criteria were removed. Items 4, 6, 9, 20, 52, 61, 62, and 63 were found to not meet the criteria, while other items had significant discrimination (*p*<0.01). Please refer to Table 1 for further details. These results indicated that the remaining items in the pre-test version of SMPS-PPE had high discrimination and better discriminatory power.

Correlation analysis method. The correlation analysis method is used to explore the relationship between the total score of SMPS-PPE and the scores of each item in SMPS-PPE. Under the precise guidance of the correlation coefficient standard, items with correlation coefficients that do not meet the standard should be deleted. Specifically, Based on Ebel's (1951) recommendations for developing

scales, items with a discriminant index below 0.20 should be eliminated (Ebel, 1951). To assess the relationship between each item and the overall scores of SMPS-PPE, a Pearson correlation analysis was conducted separately for each of the 114 Pre-test version of SMPS-PPE returned. The correlations between each of the 70 items and the overall scores of the SMPS-PPE were highly significant (*p*<0.01, see Table 5 for details), with correlation coefficients greater than 0.40. This indicates that each item was highly related to the overall SMPS-PPE and was closely related to the psychological trait or underlying behavior being measured.

Based on the results of both Critical Ratio Method and Correlation Analysis Method, items 4, 6, 9, 20, 52, 61, 62, and 63 removed from the SMPS-PPE. Therefore, a total of 62 items were deemed suitable and retained used for developing and validating SMPS-PPE continuingly.

3.2. Exploratory factor analysis

A questionnaire named SMPS-PPE (Beta Version) with the remaining 62 items was created for EFA. In the process of EFA, we conducted KMO and Bartlett's tests, maximum variance, and factor naming. More information on the analysis can be found below:

3.2.1. KMO and Bartlett's tests

To assess the suitability of the SMPS-PPE for EFA, the KMO and Bartlett's tests were conducted on the total of 62 items from SMPS-PPE (Beta Version). The coefficient analysis showed a KMO value of 0.904 and a highly statistically significant (*p*<0.01) χ^2 value of 1,667.535 for

TABLE 4 Information of participants for confirmatory factor analysis (CFA) by SMPS-PPE (Final version) (*N*=434).

Variables	Content	Fre.	Percent (%)
Sex	Male	288	66.4
	Female	146	33.6
Ethnicity	Han	244	56.2
	Minority	190	43.8
Location	Eastern	172	39.6
	Middle	127	29.3
	Western	34	7.8
	North-Eastern	101	23.3
Grade	First	54	12.5
	Second	126	29.0
	Third	113	26.0
	Fourth	141	32.5
Type of university	Comprehensive University	158	36.4
	Normal College	129	29.7
	Sports College	147	33.9
Level of university	985	109	25.1
	211	107	24.6
	Key	104	24.0
	Average	114	26.3

the Bartlett's spherical test (refer to Table 6 for details). The KMO value of 0.904 indicates that the correlation between the items is suitable for factor analysis since it is not significantly different. Additionally, the Bartlett's spherical test results rejected the null hypothesis, indicating that the individual items of SMPS-PPE are not independent of each other, and there are common factors present between the correlation matrices of the parent groups, making them suitable for factor analysis. These results provide consistent information that supports the suitability of the SMPS-PPE for EFA (Table 7).

3.2.2. Maximum variance

After conducting a principal component analysis with Varimax rotation on the initial 62 items of the SMPS-PPE (Beta Version), 36 components were retained based on the Kaiser-Guttman rule (Kaiser, 1960). Items 2, 3, 4, 7, 9, 11, 12, 13, 18, 19, 20, 21, 23, 25, 26, 32, 33, 36, 37, 38, 40, 43, 44, 46, 48, 49, 51, 53, 55, 56, 57, 58, 59, 60, 61, and 62 were removed based on a threshold of <0.4 for the loading coefficients. The remaining 26 items met the requirements and are presented in Table 8. The factor loadings ranged from 0.648 to 0.817, and all items in SMPS-PPE had a commonality of >0.40. Factor 1 (10 items) included items 1, 5, 8, 10, 14, 27, 35, 45, 50, and 54. Factor 2 (9 items) included items 15, 16, 17, 24, 28, 29, 31, 42, and 47. Factor 3 (7 items) included items 6, 22, 30, 34, 39, 41, and 52.

Furthermore, the steep slope plot (see Figure 1) shows that the slope tends to flatten out after the third principal component, indicating that retaining three factors is appropriate.

3.2.3. Factor naming

After analyzing the items of SMPS-PPE, we found that all items were aligned with the professional expectations in the field of physical education. There was a strong correspondence between factors and items, and we named factor 1 as Overall Perception, factor 2 as Value Perception, and factor 3 as Risk Perception. After completing the EFA, we deleted items 2, 3, 4, 7, 9, 11, 12, 13, 18, 19, 20, 21, 23, 25, 26, 32, 33, 36, 37, 38, 40, 43, 44, 46, 48, 49, 51, 53, 55, 56, 57, 58, 59, 60, 61, and 62. Totally, 44 items were removed from the SMPS-PPE of pre-test version (Table 9).

3.3. Scale structure exploration based on confirmatory factor analysis

Before conducting CFA for SMPS-PPE's structure exploration, the data from the third round of SMPS-PPE (*N* = 429) were analyzed for reliability, validity:

3.3.1. Reliability analysis

The Cronbach's coefficient alpha was used to examine the internal consistency reliability of the SMPS-PPE. Table 10 shows that the overall alpha coefficient of the SMPS-PPE was 0.982. The alpha coefficients for the Overall Perception, Value Perception, and Risk Perception factors were 0.907, 0.929, and 0.852, respectively. These results indicate that the consistency or homogeneity among all the items of SMPS-PPE was good, and the scale had high reliability.

3.3.2. Folded half reliability

After eliminating the required items, the 26 remaining items were sorted into two parts, and the results are displayed in Table 11. The first half had a Cronbach's alpha coefficient value of 0.948, and the second half had a value of 0.946, both of which exceeded 0.8. Additionally, the correlation coefficient value between the first and second halves was 0.881, and the coefficient of confidence in the fold was 0.936, both of which were also greater than 0.8, indicating high-quality reliability. According to Cronbach's (1951) criteria, a fold-half reliability greater than 0.8 indicates high-quality reliability (Cronbach and Meehl, 1955). Therefore, all scales met the criteria and can be used in subsequent analyses. To further investigate the consistency of individual items within the SMPS-PPE across dimensions, Table 11 provides the corresponding item-wise statistics for the three dimensions.

In accordance with psychometric requirements, a Cronbach's α coefficient greater than 0.9 indicates good reliability, while a split-half reliability greater than 0.8 indicates high-quality reliability. Based on these criteria, this scale meets the standards and can be used for further analysis. To further examine the consistency of each item within the internal dimensions of the SMPS-PPE, Table 12 provides the corresponding item-total statistics for the three dimensions.

3.3.3. Validity analysis

Various types of scale validity tests exist, such as structural validity, content validity, and calibration validity. However, given that the SMPS-PPE was still in its early stages of development, there was a lack of comparable scale both domestically and internationally. As a

TABLE 5 Correlation between the 70 items and total score of SMPS-PPE (Pre-test version) (N=114).

Number	Average	Standard deviation	Correlation coefficient	Number	Average	Standard deviation	Correlation coefficient
1	3.880	1.0943	0.619**	37	3.880	0.9351	0.813**
2	3.300	1.2102	0.467**	38	3.780	0.9907	0.553**
3	3.820	1.1315	0.627**	39	3.660	0.9125	0.659**
5	3.700	0.9692	0.613**	40	3.180	1.2979	0.534**
7	4.100	0.9482	0.596**	41	3.980	0.9533	0.713**
8	3.400	1.1721	0.458**	42	3.380	1.0228	0.680**
12	3.820	1.0767	0.535**	43	3.600	0.9640	0.783**
13	3.600	0.9211	0.607**	44	4.000	0.9640	0.617**
14	3.480	1.0869	0.576**	45	3.840	0.9505	0.759**
15	4.100	0.8103	0.703**	46	3.660	1.1479	0.639**
16	3.700	1.0299	0.506**	47	3.800	1.1371	0.634**
17	3.900	1.0101	0.627**	48	3.420	1.0841	0.592**
18	3.980	1.0539	0.684**	49	3.280	1.0644	0.429**
19	4.060	0.9081	0.637**	50	3.500	1.1055	0.652**
21	4.000	0.8989	0.570**	51	3.680	0.9732	0.655**
22	3.120	1.1658	0.416**	53	3.920	0.9394	0.723**
23	3.400	0.9428	0.603**	55	3.540	1.0093	0.616**
24	3.560	0.9673	0.677**	56	3.240	1.1817	0.634**
25	3.980	0.9099	0.723**	57	4.000	0.8040	0.721**
26	3.940	0.9301	0.783**	58	3.540	1.0291	0.584**
27	3.560	0.9673	0.656**	59	3.860	0.8764	0.709**
28	3.880	0.9773	0.690**	60	3.540	0.9684	0.427**
30	3.520	1.1054	0.699**	64	3.480	0.9043	0.614**
31	3.680	0.9307	0.736**	65	3.120	1.0943	0.380**
32	3.740	1.0012	0.749**	66	3.680	0.6799	0.532**
33	3.840	0.9070	0.730**	67	3.240	1.0162	0.510**
34	3.660	1.0562	0.663**	68	3.480	0.8100	0.566**
35	3.740	0.8718	0.764**	69	3.380	0.8502	0.520**
36	3.200	1.3027	0.640**	70	3.640	0.8935	0.390**

*indicates $p < 0.05$; **indicates $p < 0.01$.

TABLE 6 KMO and Bartlett's sphericity test results for the SMPS-PPE (Beta version) (N=429).

KMO values	Bartlett 's test		
0.904	χ^2 (approximate cardinality)		1,667.535
	df (degrees of freedom)		153
	Sig. (p)		0.000**

*indicates $p < 0.05$; **indicates $p < 0.01$.

result, this study primarily focused on testing content validity and construct validity.

3.3.4. Content validity

The development of this scale involved a systematic process, which included an extensive literature review, online posts collected in social media, personal interviews, and continuous expert consultation (Khan, 2017; Xu et al., 2023). Firstly, a literature review on preservice physical education teachers' perceptions of social media was conducted both domestically and internationally, including a total of 48 Chinese and 203 English articles were obtained and analyzed to extract preliminary concepts and support the theoretical framework developed in this study. Secondly, 17 preservice physical education teachers were interviewed using semi-structured interviews, and the generated theory underwent a rigorous coding process based on grounded theory. The concepts from this systematic theory were used as a foundation for developing items. Additionally, online posts related to physical education, such as those using the hashtags #pechat and #pe, were collected from popular social media platforms such as WeChat, Twitter, and TikTok. Finally, five professors in physical education were invited to provide guidance on the items, and with the joint efforts of the experts and research assistants, the scale was

TABLE 7 Variance explained results for the SMPS-PPE (Beta version) (*N*=429).

Factor number	Characteristic roots			Explanation of variance before rotation			Explanation of variance after rotation		
	Characteristic roots	Explanation of variance %	Cumulative %	Characteristic roots	Explanation of variance %	Cumulative %	Characteristic roots	Explanation of variance %	Cumulative %
1	13.979	53.765	53.765	13.979	53.765	53.765	7.154	27.515	27.515
2	2.431	9.351	63.116	2.431	9.351	63.116	6.443	24.780	52.294
3	1.854	7.131	70.247	1.854	7.131	70.247	4.668	17.953	70.247
4	0.945	3.636	73.883	–	–	–	–	–	–
5	0.852	3.277	77.160	–	–	–	–	–	–
6	0.691	2.659	79.819	–	–	–	–	–	–
7	0.617	2.371	82.190	–	–	–	–	–	–
8	0.538	2.071	84.262	–	–	–	–	–	–
9	0.485	1.867	86.128	–	–	–	–	–	–
10	0.458	1.762	87.890	–	–	–	–	–	–
11	0.373	1.434	89.324	–	–	–	–	–	–
12	0.347	1.334	90.658	–	–	–	–	–	–
13	0.319	1.225	91.883	–	–	–	–	–	–
14	0.310	1.193	93.076	–	–	–	–	–	–
15	0.273	1.049	94.125	–	–	–	–	–	–
16	0.235	0.902	95.027	–	–	–	–	–	–
17	0.220	0.845	95.872	–	–	–	–	–	–
18	0.183	0.702	96.574	–	–	–	–	–	–
19	0.171	0.657	97.231	–	–	–	–	–	–
20	0.153	0.590	97.821	–	–	–	–	–	–
21	0.148	0.569	98.391	–	–	–	–	–	–
22	0.115	0.443	98.834	–	–	–	–	–	–
23	0.104	0.399	99.232	–	–	–	–	–	–
24	0.089	0.341	99.573	–	–	–	–	–	–
25	0.058	0.222	99.795	–	–	–	–	–	–
26	0.053	0.205	100.000	–	–	–	–	–	–

continually revised and adjusted through several rounds of feedback from test results. Therefore, the scale can be considered to have good content validity.

3.3.5. Structural validity

The correlation coefficients between the three dimensions and the total SMPS-PPE score were found to be 0.923, 0.991, and 0.895, respectively. According to Tuker's theory (1949), a reasonable level of construct validity is indicated by a correlation between items and the total SMPS-PPE score between 0.30 and 0.80, and a correlation between factors between 0.10 and 0.60 (Tucker, 1951). Therefore, the observed correlation coefficients suggest a reasonable degree of independence between the factors within the SMPS-PPE, and that each factor is measuring what the overall SMPS-PPE intends to measure. Hence, the SMPS-PPE demonstrates good structural validity, as presented in Table 8.

3.3.6. Confirmatory factor analysis

The construction of an ideal theoretical model should take the following criteria into account: (i) The range of variation for GFI, AGFI, NFI, TLI, CFI, and IFI should be between 0 and 1, with values closer to 1 indicating a better fit. (ii) A lower value of χ^2, with χ^2/df $\leq$ 5 (if $1 < \chi^2$/df < 2, then the fit is considered good). (iii) Lower values of RMSEA, with RMSEA ≤ 0.05 (RMSEA ≤ 0.08 is also acceptable). Furthermore, a good model fit is indicated when χ^2/df < 2, RMSEA < 0.05, and the values for GFI, AGFI, NFI, TLI, CFI, and IFI are all above 0.90 (values above 0.80 are also acceptable).

3.3.7. Structural equation model

This process aimed to validate the scientific nature and model fit of the theoretical model. To achieve this, the covariance matrix of the sample was obtained and used to validate the model. The validation factor analysis results are presented in Table 13, and the structural model plot is shown in Figure 2. The results in Table 13 indicate a good overall fit of the theoretical model for the scale, with χ^2/df $= 1.053$, GFI $= 0.940$, RMSEA $= 0.012$, AGFI $= 0.928$, CFI $= 0.940$, IFI $= 0.984$, and TLI $= 0.982$.

Upon reviewing Table 13, it can be observed that all the fit indices of the model have achieved the level of good model fit. Therefore, the formal survey data have validated that the three-factor structure is reasonable and valid. The three-factor structure model is illustrated in Figure 2.

4. Discussion

This study followed a rigorous procedure for psychological scale development to create the SMPS-PPE. The SMPS-PPE consists of three dimensions, including total of 26 items: overall perception, value perception, and risk perception. Ten items in the overall perception dimension, 9 items in the value perception dimension, and 7 items in the risk perception dimension. The development process included item analysis, EFA, reliability testing and CFA, ensuring that the scale is standardized and rigorous. In this study, we utilized the Convergence model (Creswell and Clark, 2017) to examine the qualitative and

TABLE 8 Results of the correlation matrix for the SMPS-PPE (Beta version) (*N*=429).

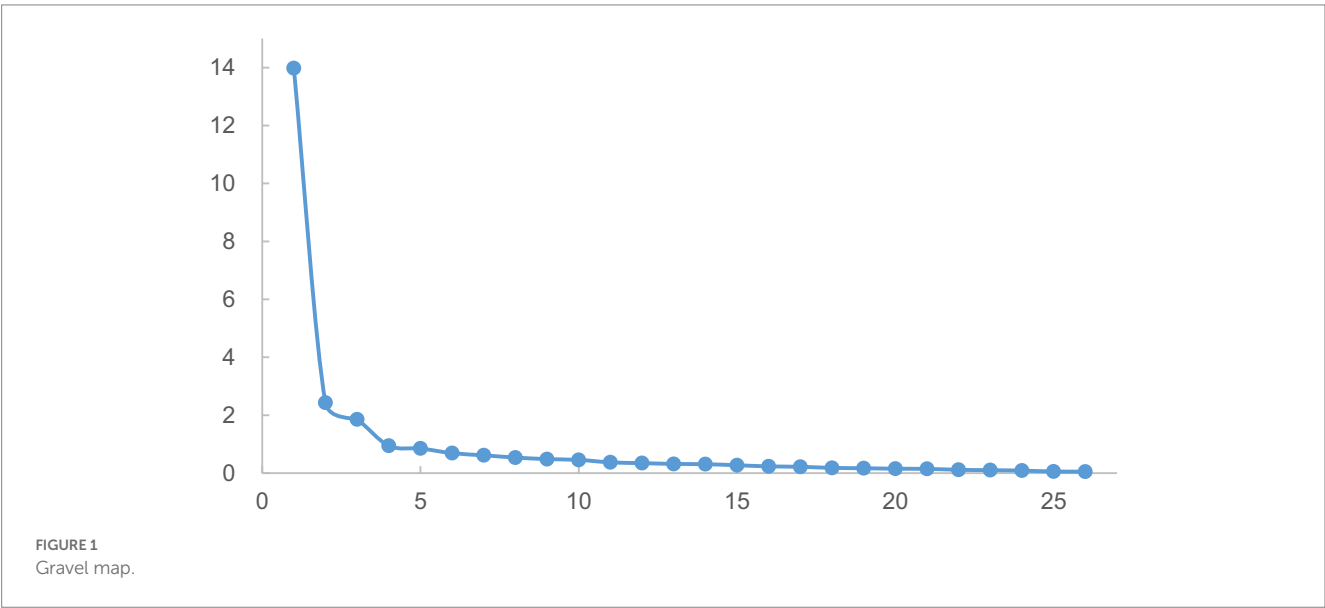|	Overall perception	Value perception	Risk perception	Total score
Overall perception	1.000	0.705**	0.761**	0.923**
Value perception	0.705**	1.000	0.773**	0.881**
Risk perception	0.761**	0.773**	1.000	0.895**
Total scale	0.923**	0.881**	0.895**	1.000

*indicates *p* < 0.05; **indicates *p* < 0.01.

FIGURE 1
Gravel map.

TABLE 9 Rotation matrix of three factor loadings of 26 items in the SMPS-PPE (Beta version) (*N*=429).

Item		Public factor		
		Factor 1	Factor 2	Factor 3
A50.	I found that the size of the online user base related to physical education is very large	0.817	0.321	0.224
A5.	I find myself surrounded by students and teachers who use social media a lot	0.796	0.243	0.124
A1.	I felt that the sport or teaching related graphics and videos were presented smoothly and clearly	0.793	0.324	0.194
A8.	I feel that for pre-service PE teachers social media typography is simple and easy to understand	0.753	0.326	0.186
A45.	I think the color scheme and other designs are in line with the aesthetics of pre-service PE teachers	0.737	0.141	0.250
A27.	I feel that sports information in social media is easy to retrieve and collect and organize	0.719	0.361	0.246
A35.	I think social media can help break down the unequal distribution of resources for physical education	0.704	0.434	0.121
A54.	I feel that the content shared by users in social media is fragmented	0.703	0.427	0.209
A10.	I find that information content such as sports and fitness has a high level of interest in social media	0.668	0.431	0.107
A14.	I feel that in the future there will be a clearer classification of content related to the teaching of physical education	0.664	0.476	0.140
A16.	I think social media can provide me with cutting-edge information on physical education	0.272	0.778	0.307
A17.	I feel that social media integrates the learning of physical education majors	0.369	0.767	0.151
A31.	I think an inclusive sharing atmosphere is good for pre-service PE teachers to develop interdisciplinary perspectives	0.313	0.765	0.197
A47.	I think the sharing function of social media can showcase all aspects of sport	0.259	0.762	0.185
A29.	I feel that formats such as graphic videos are good for building the image of movement for pre-service PE teachers	0.247	0.724	0.329
A42.	I think funny emojis can meet the social entertainment needs of pre-service PE teachers	0.368	0.704	0.259
A15.	I feel that applications such as replay shifting make the dynamics of technique and tactics more clear	0.402	0.676	0.138
A28.	I feel that access to physical education related information is mostly free or low cost	0.442	0.674	0.193
A24.	I feel that the Smart Push service has enabled me to learn about other knowledge skills outside of sport	0.237	0.648	0.380
A34.	I am concerned that the limited perspective of formats such as video or graphics may affect the learning of technical essentials	0.166	0.262	0.813
A22.	I am concerned that other users may steal or misappropriate my personal knowledge and skills in physical education	0.029	0.196	0.771
A52.	Seeing students around me share information about pre-service PE teachers made me feel heavy pressure	0.063	0.406	0.732
A6.	Pre-service PE teachers who lack teaching experience are prone to misunderstandings or arguments in sharing	0.491	−0.013	0.715
A41.	I feel that most of the sports knowledge and skills shared by users in social media are not very credible	0.185	0.286	0.712
A39.	I think social media lacks a screening mechanism for outdated, poor quality, fraudulent sports information	0.420	0.236	0.697
A30.	I feel it is difficult to receive timely responses from high level PE teachers or experts in social media	0.501	0.123	0.675

quantitative data. By combining the findings, we gained a more comprehensive understanding of the research questions. Our previous publication, Xu et al. (2023), focused on the qualitative phase of the study, which yielded rich data for analysis. In this article, we will present the results of the quantitative phase, which validates the earlier findings and offers new insights into the perceptions of social media among preservice physical education teachers. Specifically, the model constructed in Xu et al. (2023) also found there are three dimensions (Xu et al., 2023), it implies that our studies was consistent with previous studies and theory.

The main purpose of the item analysis was to assess the differentiation between the items in the SMPS-PPE, to prevent redundancy and ensure that each item focused on distinct elements. To ensure accuracy, both the critical ratio method and correlation analysis were used for cross-validation. Specifically, the critical ratio method involved conducting an independent samples *t*-test for 27% of the high and 27% of the low subgroups. After testing for differentiation and correlation, it was found that items 4, 6, 9, 20, 52,

61, 62, and 63 did not meet the criteria, while the remaining 62 test items were highly differentiated ($p < 0.01$), indicating good discriminatory power. Correlation analysis showed that each item in the SMPS-PPE had a correlation greater than 0.40 with the total score of the SMPS-PPE, indicating high homogeneity. Combining the results of the critical ratio method and correlation analysis, it was found that the items in the pre-test version of the SMPS-PPE were highly independent but had a high correlation with the total score of the SMPS-PPE, thus confirming the appropriateness of the items. Then, based on the 429 returned questionnaires, EFA was conducted on the 62-item SMPS-PPE (beta version). After applying the principal component analysis with maximum variance (Varimax) for positive cross-rotation, 36 components were obtained. However, items 2, 3, 4, 7, 9, 11, 12, 13, 18, 19, 20, 21, 23, 25, 26, 32, 33, 36, 37, 38, 40, 43, 44, 46, 48, 49, 51, 53, 55, 56, 57, 58, 59, 60, 61, and 62 did not meet the requirements and were removed, leaving a total of 26 items with loadings that met the criteria. Additionally, we analyzed the reliability and validity of the three dimensions and 26 items in SMPS-PPE. The

TABLE 10 Three factors and alpha coefficients of SMPS-PPE (*N*=429).

Factors	Overall perception	Value perception	Risk perception	SMPS-PPE
Internal consistency reliability (α coefficient)	0.907	0.929	0.852	0.982

TABLE 11 Results of discounted half confidence analysis (*N*=429).

Cronbach's alpha coefficient				Correlation coefficient values	Discount factor		Guttman coefficient
First half		Second half			Equal length	Unequal length	
Value	Number of items	Value	Number of items	0.881			0.937
0.948	13	0.946	13		0.937	0.937	

TABLE 12 Overall statistics for SMPS-PPE items for each dimension (*N*=429).

Dimensionality	Title item	Dimensions when items are deleted average	When an item is deleted the scale variance of	Amended total project relevance	Relevance Square	Cronbach at the time of item deletion alpha factor
Overall perception	A50	35.020	57.527	0.866	0.790	0.945
	A5	35.110	56.772	0.824	0.741	0.946
	A1	35.045	57.119	0.831	0.709	0.946
	A8	35.055	57.409	0.845	0.779	0.945
	A45	35.280	57.569	0.693	0.547	0.952
	A27	35.115	56.997	0.829	0.742	0.946
	A35	35.140	57.890	0.676	0.556	0.953
	A54	35.105	57.431	0.857	0.756	0.945
	A10	35.225	58.145	0.798	0.699	0.947
	A14	35.175	58.045	0.782	0.689	0.948
Value perception	A16	31.295	38.822	0.856	0.768	0.948
	A17	31.335	38.736	0.850	0.752	0.948
	A31	31.365	39.198	0.844	0.733	0.949
	A47	31.280	39.479	0.777	0.651	0.952
	A29	31.435	38.579	0.813	0.680	0.950
	A42	31.320	38.792	0.812	0.687	0.950
	A15	31.345	40.157	0.769	0.609	0.952
	A28	31.255	39.528	0.841	0.757	0.949
	A24	31.370	39.129	0.807	0.685	0.951
Risk perception	A34	23.930	22.839	0.879	0.803	0.927
	A22	23.910	23.771	0.836	0.748	0.931
	A52	23.930	24.166	0.747	0.613	0.939
	A6	23.830	24.574	0.764	0.640	0.937
	A41	23.910	23.801	0.820	0.748	0.932
	A39	23.895	24.295	0.744	0.630	0.939
	A30	23.935	23.217	0.875	0.800	0.927

alpha coefficient of each of the three dimensions and the alpha coefficients of the front and back parts of the scale were all greater than 0.90, indicating that the items in the SMPS-PPE had good consistency and homogeneity, and the SMPS-PPE had high reliability.

The validity analysis showed that the content validity of the SMPS-PPE was appropriate, and the correlation matrix coefficients between the items and within the dimensions met the requirements, indicating that the SMPS-PPE was well-structured and had good validity.

TABLE 13 CFA model fit results (*N*=434).

Commonly used standards	χ^2/df	GFI	RMSEA	AGFI	CFI	IFI	TLI
Judgment criteria	<3	>0.9	< 0.1	>0.9	>0.9	>0.9	>0.9
Value	1.053	0.940	0.012	0.928	0.940	0.984	0.982

FIGURE 2
A three-factor model of the SMPS-PPE. e residual error.
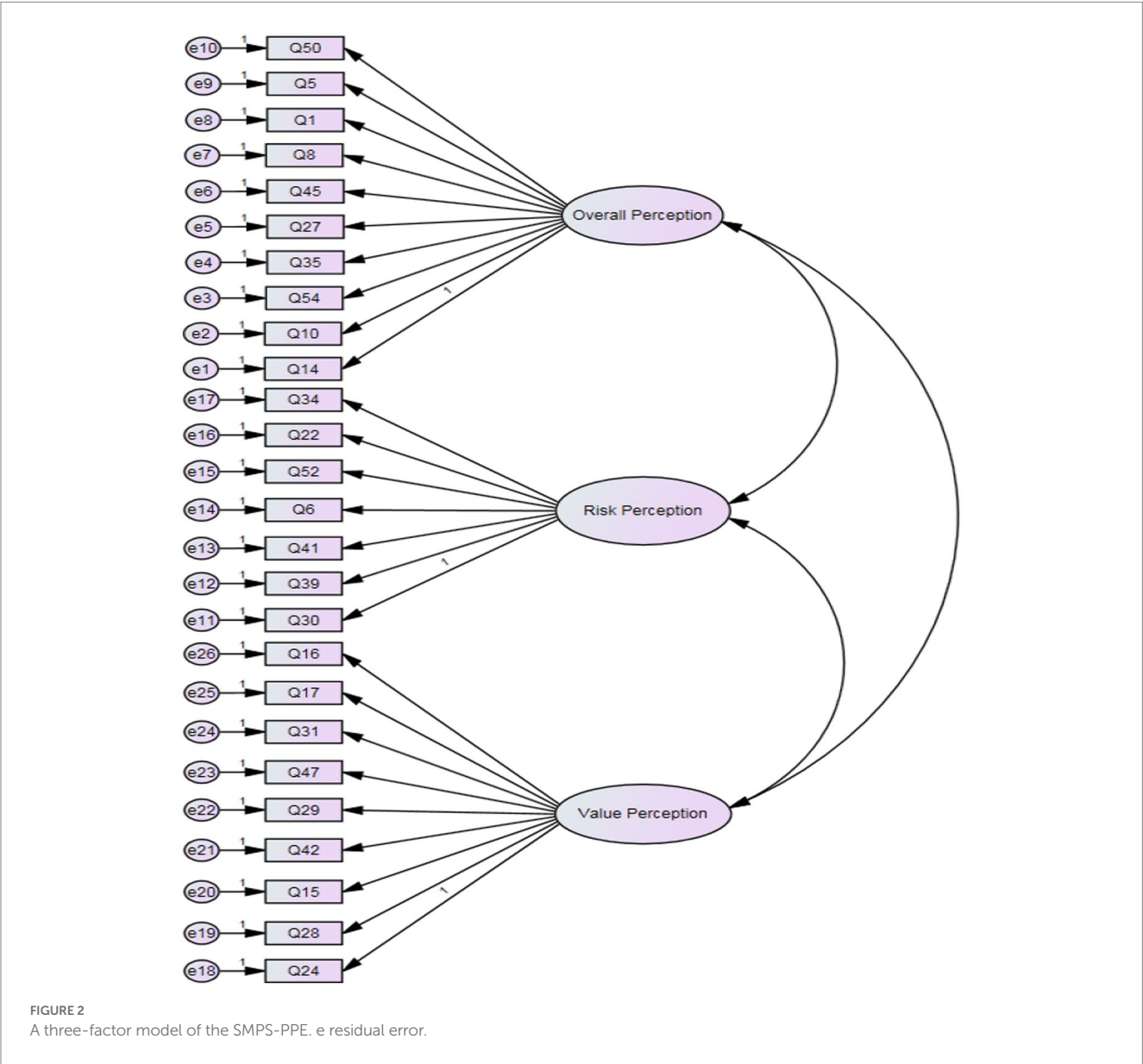
Based on the systematic and scientific quantitative analysis process described above, the SMPS-PPE (Official Version) was developed, consisting of 26 items. The SMPS-PPE (Official Version) was administered to 434 participants and subjected to CFA using structural equation modeling. The fit indices of the three-factor structural model, including χ^2/df, GFI, AGFI, IFI, NFI, TLI, CFI, RMR, and RMSEA, all reached the level of a good model fit. This indicates that the three-factor structure of pre-service physical education teachers' social media perception was found to be reasonable and valid by EFA and CFA. Therefore,

the structure of the SMPS-PPE is reasonable and can be validated. Overall, this study culminated in the development of a validated SMPS-PPE.

The SMPS-PPE implicates that social media perception is a complex interrelationship of discourse. Posits that social media perception is a complex interplay of discourse, involving the interrelationships among social media perception, value perception, and risk perception. This intricate relationship can significantly influence the attitudes and behaviors of preservice physical education teachers toward social media. It is crucial for preservice

teachers to comprehend that their engagement and perception of social media are shaped by their overall perception of it, as well as their appraisal of its value and associated risks. For instance, preservice physical education teachers can utilize this knowledge to deliberately reflect on their use of social media, taking into account its potential impact on their professional development and instructional practices. By acknowledging the multifaceted and complex nature of these factors, preservice teachers can make informed decisions about how to leverage social media to enhance their knowledge and skills, and keep abreast of the latest advancements in their field.

For the explanation of each dimension, we found that the value dimension of social media is mainly about authenticity and credibility, while digital divide and fragmentation are widely discussed in the risk perception of social media. In social media, authenticity refers to the extent to which social media content reflects the genuine thoughts and behaviors of its creators (Hobbs, 1997, 2018), while credibility refers to the degree to which social media content is perceived as accurate and trustworthy by its consumers (Hobbs, 2010). Based on our data, the use of social media in physical education has both positive and negative impacts on authenticity and credibility. On the positive side, the large online user base and prevalence of social media use among students and teachers create a convenient platform for sharing and organizing sports-related information. The graphics and videos presented on social media are also clear and esthetically pleasing, and the typography is simple and easy to understand. Social media can help break down the unequal distribution of resources for physical education and provide cutting-edge information to pre-service physical education teachers. However, there are also concerns about the authenticity and credibility of information shared on social media. The content shared by users is often fragmented and lacks a screening mechanism for outdated or fraudulent information. Pre-service PE teachers without teaching experience may be prone to misunderstandings or arguments, and the pressure to share credible information can be overwhelming. It is also difficult to receive timely responses from high-level physical education teachers or experts. Overall, while social media can be a valuable tool for sharing information and breaking down barriers, it is important to approach it with caution and critical thinking among preservice physical education teachers.

To summarize, a valid scale for assessing the SMPS-PPE was developed through exploratory and confirmatory factor analysis. The overall perception factor comprises 10 items (1, 5, 8, 10, 14, 27, 35, 45, 50, 54), the value perception factor includes 9 items (15, 16, 17, 24, 28, 29, 31, 42, 47), and the risk perception factor comprises 7 items (6, 22, 30, 34, 39, 41, 52). The scale demonstrated good reliability, indicating that it is a scientifically sound and dependable instrument.

5. Conclusion

The social media perception assessment scale developed in this study can serve as a valuable tool for evaluating the current stages of social media perception among preservice physical education teachers. It can also be used to identify current issues reflected in their perception of social media and provide guidance for administrative departments to design education programs for physical education teachers and assess the information technology capabilities of preservice physical education teachers.

6. Limitations and future research

As no research is impeccable, the present research of developing and validating SMPS-PPE also possessed some limitations that offer further research opportunities:

To facilitate the professional development of preservice physical education teachers in social media context, it is advisable to implement appropriate assessment tools to measure their social media literacy levels in various regions. For getting a global and comprehensive understanding, this is particularly important in Asian countries where previous research has identified a gap in this area, such as China, India, Korea, and Japan. This will enable preservice physical education teachers to gain a scientific, objective, and comprehensive understanding of their social media perception and provide a reference for improving the application of social media to promote their professional development effectively.

Given the limited sample size and locations of this study, it may not be representative of all preservice physical education across the world, which may affect the generalizability of our results. Thus, it is recommended that future research includes a larger sample size and wide sample locations to further validate and refine the scale, enhancing its applicability and scientific accuracy. Furthermore, in order to ensure that the SMPS-PPE is a valid and reliable assessment tool for measuring social media literacy levels among preservice physical education teachers, it is important to tailor it to the specific needs of this target population. Given that school teachers and university-based teacher educators in physical education have unique requirements, it is recommended that the SMPS-PPE be revised to address these needs. This may involve modifying the language used in the scale, adjusting the format of the questions, or including additional items that are relevant to the specific context of physical education. By doing so, the SMPS-PPE can provide a more accurate assessment of social media literacy levels among this population, which can inform the development of effective strategies for supporting their professional development in this area. Also, another avenue for future research could be to examine the moderating effects of additional demographic factors, such as the frequency of social media use and preferences for specific social media platforms. By doing so, a more comprehensive understanding of social media perception among physical education teachers can be attained, and effective strategies for promoting professional development in this field can be formulated.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Author contributions

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Conflict of interest

Publisher's note

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The effect of online collaborative writing instruction on enhancing writing performance, writing motivation, and writing self-efficacy of Chinese EFL learners

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Introduction: This study investigates the influence of online collaborative writing instruction on the writing performance, writing self-efficacy, and writing motivation of Chinese English as a foreign language (EFL) learners. The research was conducted at a language school in mainland China with 58 participants divided into an experimental group (n=30) and a control group (n=28).

Methods: The experimental group utilized Tencent Docs, an online platform, for collaborative writing and peer-editing activities outside the classroom, while the control group received traditional in-class instruction. The study spanned a duration of 13 weeks, during which writing tasks, writing motivation scales, and writing self-efficacy scales were employed to collect data.

Results: The findings revealed that the experimental group exhibited significantly greater improvement in writing performance, motivation, and self-efficacy compared to the control group. These results indicate the positive impact of incorporating Tencent Docs into collaborative writing instruction.

Discussion: The outcomes of this study provide valuable insights for language educators regarding the benefits of integrating online tools into EFL instruction to enhance writing skills. By leveraging platforms like Tencent Docs for collaborative writing, instructors can foster improved performance, increased motivation, and enhanced self-efficacy among EFL learners. Overall, this research highlights the effectiveness of online collaborative writing instruction and its potential as a valuable tool for language educators seeking to optimize EFL learners' writing abilities.

KEYWORDS

online collaborative writing instruction, writing performance, writing self-efficacy, writing motivation, EFL learners, Tencent docs

Introduction

English as a Foreign Language (EFL) writing is a critical component of language proficiency and has received considerable attention from researchers in the field of second language (L2) education (Hwang et al., 2014). The increasing importance of English in the global arena has led to a growing interest in the teaching and learning of English writing (Zhao, 2010). Writing, being a complex and dynamic task, requires a significant amount of effort and practice to become proficient. In recent years, technology has revolutionized the way English is taught, and technology-assisted writing instruction has become a critical component of EFL writing (Barrot, 2021; Cancino and Panes, 2021; Loncar et al., 2021; Lin et al., 2022).

The increasing use of technology and the Internet has had a significant impact on language education, including EFL instruction (Hung, 2021). The use of online tools and platforms, such as wikis, blogs, podcasts, and Google Docs, has gained popularity as a means of creating interactive and collaborative writing environments for EFL students (Strobl, 2014; Dizon, 2016; Ebadi and Rahimi, 2017; Reinhardt, 2019; Saricaoglu, 2019; Xu et al., 2019; Hafner and Ho, 2020; Fathi et al., 2021; Hung et al., 2022). These tools allow students to practice English in an engaging and dynamic setting, while also promoting active learning, teamwork, and the development of social skills (Ravid et al., 2008; Xu et al., 2019; Barrot, 2021; Liu et al., 2023). The notion of using technology to support writing instruction via online collaborative writing is becoming increasingly appealing to EFL educators, as it offers solutions to limitations in time and space in traditional learning settings (Xu, 2021; Rahimi and Fathi, 2022).

The online environment provides opportunities for learners to receive immediate and constructive feedback from their peers and instructors, and engage in peer-editing and revision activities. This learning context also provides students with access to a range of resources, such as online dictionaries, grammar checkers, and writing samples, that can help students develop their writing skills (Reinhardt, 2019; Hafner and Ho, 2020). Google Docs is one such platform that is well-suited for facilitating peer feedback and collaboration among students (Ebadi and Rahimi, 2017; Fathi et al., 2021; Hoang and Hoang, 2022). The platform provides an easy means of uploading, sharing, and editing documents, allowing students to work together in real time and enhancing their learning experience (Yang, 2010; Liu and Lan, 2016; Ebadi and Rahimi, 2017). The use of such online collaborative writing platforms as a tool for writing instruction also offers benefits for EFL teachers, allowing them to encourage free expression and provide timely feedback (Chukharev-Hudilainen and Saricaoglu, 2016; Lai et al., 2016; Cho, 2017; Li, 2018; Fathi et al., 2021).

In this study, we investigate the impact of using a word processing tool on the writing performance of Chinese EFL learners. Specifically, we examine the effects of Tencent Docs, a commonly used word processing tool in China, on the writing development participants. It is worth mentioning that Tencent Docs, while having most of the features of Google Docs, was used in this study instead of Google Docs. This is because Google Docs is not widely used in China and Tencent Docs is the most commonly used alternative. Tencent Docs is a popular software suite used for productivity and document management in China. As a platform that offers multiple functionalities, including word processing, spreadsheets, and presentations, Tencent Docs is well-suited for language learning. In particular, the word processing component provides a rich environment for English writing learning, particularly for Chinese EFL learners (Tan et al., 2022). This is due to the software's various tools that support EFL learners as they work on writing assignments and develop their writing skills. For instance, Tencent Docs Tencent Docs includes spell checkers, grammar checkers, and text-to-speech technology, which can help learners identify and correct errors in their writing (Zou et al., 2021), as well as improve their pronunciation and intonation. Moreover, the software offers a range of formatting options, including font size, style, and color, which can help learners develop their writing style and improve the overall readability of their texts.

Additionally, Tencent Docs enables learners to easily save, store, and share their documents in the cloud, allowing them to collaborate with peers and receive feedback from their teachers. This feature facilitates peer review and feedback, which can help learners refine their writing skills and gain confidence in their abilities. Furthermore, Tencent Docs offers templates and sample documents that can help learners develop their writing skills in various genres, such as academic essays, business letters, and personal narratives.

Concerning L2 writing, previous research has shown that collaborative writing instruction can enhance students' writing performance, motivation, and self-efficacy (e.g., Rahimi and Fathi, 2022). Nevertheless, exploring the effectiveness of using online collaborative writing tools, such as Tencent Docs, in L2 writing instruction is still under-researched. Although some studies have investigated the use of Google Docs and other collaborative writing tools (e.g., Ebadi and Rahimi, 2017; Zou et al., 2021; Hoang and Hoang, 2022), to the best of our knowledge, no previous studies have explored the use of Tencent Docs in L2 writing instruction.

Tencent Docs has several unique features that may contribute to the effectiveness of online collaborative writing instruction. Firstly, Tencent Docs is a widely used online writing tool in China, making it readily accessible for language learners in mainland China. Secondly, Tencent Docs offers a wide range of writing resources, such as dictionaries, grammar checkers, and online writing communities, that can facilitate the collaborative writing process (Tan et al., 2022). Thirdly, Tencent Docs allows for real-time collaboration and peer feedback, which can enhance students' writing skills and engagement in the writing process (Ma and Au, 2014; Li et al., 2020).

As such, this study aims to address this research gap and investigate the effectiveness of using Tencent Docs as an online collaborative writing tool in enhancing Chinese EFL learners' writing performance, writing self-efficacy, and writing motivation. Through examining the unique contributions of Tencent Docs to the collaborative writing process, this study aims to provide valuable insights for language educators on the advantages of using online tools in improving EFL learners' writing skills.

The results of this study are expected to contribute to the literature on EFL writing instruction and provide valuable insights into the use of Tencent Docs as a tool to enhance writing performance, motivation, and self-efficacy of Chinese EFL learners. The findings of this study have implications for language educators, curriculum designers, and policy makers, who are interested in incorporating technology-assisted writing instruction into the EFL writing curriculum. As such, this study also seeks to answer the following research questions:

1. What is the effect of Tencent Docs on the writing performance of Chinese EFL learners?
2. What is the effect of Tencent Docs on the writing motivation of Chinese EFL learners?
3. How does the use of Tencent Docs impact the writing self-efficacy of Chinese EFL learners?

Literature review

Online collaborative writing

Online collaborative writing is a promising field of research in second language writing that involves learners working together to

co-create a single text using computer-mediated communication technologies. With advancements in technology devices, computer-mediated collaborative writing (CMCW) has become a popular field of research for L2 writing (Li, 2018; Liu et al., 2023). CMCW allows learners to enjoy ample chances for interaction, writing independence, and time–space convenience. Numerous studies have explored the impact of CMCW on various aspects of writing, such as patterns of interaction, writing outcomes, learners' attitudes, types of learning tasks, and writing processes (e.g., Wang, 2015; Wu et al., 2015; Bikowski and Vithanage, 2016; Cho, 2017; Hafner and Ho, 2020; Barrot, 2021; Hoang and Hoang, 2022). These studies have demonstrated that CMCW can improve students' writing complexity, accuracy, and fluency, as well as their overall writing performance (Reinhardt, 2019; Xu, 2021; Fathi and Rahimi, 2022; Jiang and Eslami, 2022).

In comparison to traditional face-to-face classes, online learning has been criticized for its inadequate social interaction and its limitations in overcoming the physical distance between students owing to its asynchronous and text-based nature (Lai et al., 2016; Akcaoglu and Lee, 2018). To address these challenges, methods such as synchronous online interactions, forums, and collaborative learning tasks have been proposed (Tu and Corry, 2003; Liu and Lan, 2016). Many studies have documented the beneficial influences of these activities on fostering social presence and individual communications in online learning settings. These remedial activities in educational contexts might consist of online peer-editing using Google Docs, Facebook group interactions, online collaborative assessments, blog-mediated instruction, and virtual exchanges (e.g., Pham and Usaha, 2016; Ebadi and Rahimi, 2017; Bugden et al., 2018; O'Dowd et al., 2020; Tan et al., 2022).

The integration of online educational devices in classrooms has been proven to be an effective means of promoting collaboration (Herrington et al., 2014). Web 2.0 offers various opportunities for collaboration through tools including wikis, blogs, social networks, online forums, virtual exchanges, and electronic portfolios (O'Dowd, 2020; Rahimi and Fathi, 2022). One popular application among these few tools is Google Docs, which is free and user-friendly, making it very appropriate for learners with few technology-related competencies. Google Docs is frequently employed for collaborative writing activities as far as peer-editing or peer-reviewing activities are concerned (Abrams, 2016, 2019; Rahimi and Fathi, 2022). Nevertheless, recent research indicates that there is room for improvement in terms of interactivity and enjoyment, as well as in increasing students' satisfaction and intentions to use this learning method (Dinh and Nguyen, 2020).

The process of collaborative writing, as described by Storch (2013), involves multiple learners working together to create a shared text through the exchange of information, negotiation, and decision-making. The end result reflects collective learning, and collaboration is a crucial aspect at every stage of the writing process, including planning, drafting, and editing. Li and Zhu (2013) have noted that consistent collaboration can lead to language learning opportunities, while Wang (2015) suggests that it can also foster a sense of collaboration among learners and result in improved learning outcomes (Bikowski and Vithanage, 2016). As stated by Kessler and Bikowski (2010), the evolution of collaborative writing has been influenced by technological advancements, as they provide new opportunities for collaboration. Collaborative writing has been shown to play a significant role in language development from both a socio-cultural perspective

(Vygotsky, 1978) and in the context of L2 acquisition theories (Kang and Lee, 2019; Ellis, 2021). Despite the perception of writing as a solitary activity, research has demonstrated that collaborative writing can have a positive impact on language learners' writing processes, including increased accuracy, fluency, syntactic complexity, and overall writing performance (Jekiel, 2014; Ellis, 2021). Collaboration also helps to alleviate anxiety and low confidence levels, provides opportunities for learners to support each other, co-construct their second language knowledge, and receive immediate feedback (Brooks and Swain, 2009; Storch, 2011, 2013; Ellis, 2021).

However, online collaborative writing instruction is a relatively new approach to teaching writing that has gained popularity in recent years (Bikowski and Vithanage, 2016; Cho, 2017; Abrams, 2019). Compared to traditional face-to-face collaborative writing instruction, it offers several advantages. First, it enables learners to communicate and collaborate with their peers in real-time, regardless of their geographical location (Hsu, 2020). This feature of online instruction allows learners to work together and receive feedback from peers who may not be physically present in the same location, thus broadening the scope of the collaborative writing experience. Second, online collaborative writing instruction provides learners with access to a wide range of online writing resources (Lai et al., 2016; Abrams, 2019). These resources include online dictionaries, grammar checkers, and online writing communities, which can be used to support learners' writing development. By using these resources, learners can enhance their writing skills and overcome common writing challenges more effectively (Li and Zhu, 2013; Hoang and Hoang, 2022).

According to Li (2018), the study of computer-mediated/online collaborative writing (CMCW) has been significantly influenced by sociocultural theory and social constructivism. In this context, collaborative writing is viewed as a social activity in which students interact and support one another's learning and writing development. The sociocultural theory proposed by Vygotsky (1978) emphasizes the role of interaction in the learning process, particularly the use of language as a mediating tool and the concept of scaffolding. In collaboration, one partner (the expert) supports the other partner (the novice) in their learning, and this support takes place within the Zone of Proximal Development (Vygotsky, 1978). The partners can switch roles, with the novice becoming the expert and vice versa, during the course of the collaboration (Wells, 1999). Collaboration and language mediation (Lantolf and Thorne, 2006) enable the partners to communicate and work together effectively on tasks such as knowledge construction, problem-solving, and meaning-making (Rassaei, 2014; Hafner and Ho, 2020; Hung and Nguyen, 2022).

The use of CMCW in L2 classrooms is on the rise, with an increasing recognition of the benefits brought about by Web 2.0 technologies (Cho, 2017; Li, 2018). The positive impact of computer-mediated communication (CMC) on the design of collaborative writing tasks and the collaboration process, as well as learners' writing quality and motivation, has been demonstrated in a number of studies (e.g., Armstrong and Retterer, 2008; Wang, 2015; Ebadi and Rahimi, 2017; Barrot, 2021). For example, Li and Zhu (2013) found that the use of wikis provided learners with greater flexibility in collaborative writing, while Wang (2015) reported improved learning outcomes in writing content, structure, and grammatical accuracy when using wikis for collaborative writing.

Despite the growing recognition of the benefits of CMCW in EFL contexts (Aydın and Yıldız, 2014; Wang, 2015; Xu et al., 2019; Fathi

and Rahimi, 2022), challenges remain in its implementation, particularly in areas such as China, where technical difficulties and limited exposure to educational technology have been identified as barriers to its use (Rao and Lei, 2014; Lai et al., 2016; Paul and Liu, 2017; Barrot, 2021). Benson (2019) highlights the need to consider contextual factors and individual differences when incorporating CMCW tasks into the classroom to enhance their ecological validity.

Several studies have found that web-based collaborative writing has a positive impact on the writing skills and competencies of EFL learners. Aydın and Yıldız (2014) conducted a study on the effect of three types of collaborative writing tasks on intermediate level university students using wikis in EFL learning classrooms. The results indicated that wiki-based collaborative writing tasks enhanced the use of grammatical structures and were enjoyed by students. Another study by Bikowski and Vithanage (2016) investigated the impact of in-class web-based collaborative writing tasks on individual writing scores of L2 writers. The collaborative web-based writing group showed significantly greater gains in their individual writing scores and valued the collaborative writing tasks overall. Lai et al. (2016) explored the nature of collaboration and perceived learning in wiki-based collaborative writing among university EFL learners. The study revealed that collaboration patterns featuring high equality and mutuality were associated with positive attitudes and perceived learning. Lastly, Selcuk et al. (2021) aimed to analyze Turkish high school EFL learners' self-reported accounts of their writing process in English with the support of group leaders in a web-based collaborative writing activity. The study found that group leaders facilitated planning tasks, provided corrective feedback, and emotional support such as praise and motivational phrases that increased self-confidence and motivation toward writing in English. Also, Teng (2021) aimed to explore the benefits of using interactive whiteboard technology for collaborative writing among English language learners. The study included 120 EFL students, and the results indicated that the use of interactive whiteboard technology with collaborative writing instruction led to greater improvement in students' writing performance compared to traditional whiteboard-integrated collaborative writing and traditional collaborative writing instruction without whiteboard technology. The study also found that learners who received interactive whiteboard-integrated collaborative writing instruction exhibited higher levels of metacognitive activities and were more engaged in coregulation. This study highlights the potential of interactive whiteboard-integrated collaborative writing instruction in promoting writing instruction and suggests that it should be considered in language learning classrooms.

Online collaborative writing and L2 writing affective factors

A growing amount of research shows that good L2 writing is significantly impacted by affective and non-cognitive factors since L2 writing is a cognitively demanding activity (Piniel and Csizér, 2015; Han and Hiver, 2018; Fathi et al., 2019). Psychological factors that are unique to L2 writing can considerably improve L2 learners' writing abilities by influencing their level of commitment to creating better-quality drafts (Piniel and Csizér, 2015). In light of this, the current study focused on three affective aspects of writing performance, writing motivation, and writing self-efficacy.

The primary tenets of the overall concept of motivation in L2 education serve as the foundation for L2 writing motivation, and as a

crucial component of effective L2 learning, motivation is conceived as a dynamic process that is subject to constant change (Dörnyei, 2001; Waller and Papi, 2017). L2 motivation is a dynamic construct that is influenced by both internal and external elements that are related to the learner's particular sociocultural and contextual background (Kozaki and Ross, 2011; Fathi et al., 2019). According to Dörnyei (2001), motivation determines why L2 learners choose a certain activity, how long they are willing to continue doing it, and how much work they put into it. Dörnyei (2001) further stated that motivation is a dynamic process subject to ongoing change and is a crucial component of effective L2 learning. The predominant definition of motivation nowadays emphasizes its dynamic and situational aspect. According to this viewpoint, an L2 learner is extremely likely to be impacted by many contextually dependent motives at once, and those motives may vary over time (Keblawi, 2009; Dornyei, 2019). Studies have shown that motivation is an important factor in language learning (Oxford and Shearin, 1994; Waninge et al., 2014). According to Williams and Burden (1997), L2 motivation is impacted by both internal elements that are particular to each learner and external ones that are pertinent to the learner's sociocultural context. Additionally, learning motivation consists of an effort, a desire to learn, as well as positive attitudes about learning. Since writers connect with others, express themselves, and appeal to people, writing motivation is crucial (Chen, 2016). Seyyedrezaie et al. (2016) examined how the writing process in the Google Docs environment affected Iranian EFL students' writing performance and concluded that Google Docs had a significant impact on improving students' writing abilities and writing performance. Moreover, Liu and Lan (2016) carried out a study to investigate students' perceptions, motivation and collaboration while using Google Docs. The findings of this study revealed that collaborators produced better writing, were more motivated to learn new things, and had a more optimistic outlook on the educational process. Mudawe (2018) examined the instructional potential of Google Docs as a collaborative tool to enhance EFL and ESL students' writing in a Saudi environment. The results revealed that Google Docs increased students' ability to communicate better and that Google Docs enhanced their text editing and revision in a motivating setting. According to Yang (2010), the easy use of Google Docs, which enables students to collaborate on writing assignments without being constrained by time or location, increases students' motivation.

Self-efficacy is concerned with one's perceptions of their own capacity to complete a certain learning activity. In a variety of academic situations, self-efficacy beliefs are thought to be extremely important for boosting students' interest in learning (Bandura, 1997; Dornyei and Ryan, 2015). A great amount of empirical research within the L2 learning area indicates that strong self-efficacy is favorably connected with task performance and L2 skills (e.g., Pajares, 2003; Hsieh and Kang, 2010; Woodrow, 2011). Lower writing anxiety, a better sense of oneself as a writer, and a higher estimation of the importance of writing have all been linked to writing self-efficacy (Pajares, 2003; Fathi et al., 2019). According to a research by Piniel and Csizér (2015), writing self-efficacy is also positively connected with the learner's interest and perseverance, self-regulatory ability, writing self-concept, goal achievement, and good writing performance. Also, according to Han and Hiver (2018), writing self-efficacy is defined as L2 learners' views and confidence in their skills as L2 writers. According to social cognitive theory, self-efficacy is the belief and assessment that a person has regarding their capacity to perform at a

given level and achieve particular objectives. Self-efficacious people establish tough objectives, are deeply dedicated to accomplishing them, are prepared to put up a considerable deal of effort to continue achieving particular objectives despite obstacles, and regain their feeling of effectiveness if they fail. According to Pajares (2003), mastery experiences have the greatest impact on how people perceive their level of self-efficacy because success increases it while failure decreases it. As a result, a person's level of self-efficacy in writing is based on how confident they are in their ability to produce a particular kind of text. Moreover, Schunk and Zimmerman (2012) found that self-efficacious writers prefer to write more regularly and stick with writing assignments more frequently than students who have poor self-esteem. In other words, self-efficacy beliefs are substantially connected with students' success and performance on writing activities. Students who feel self-sufficient in a writing course are more likely to choose writing projects and maintain an interest in completing them (Bandura, 1997; Tsiakyroudi, 2018). In addition, a self-efficacious writer shows strong enthusiasm for writing assignments, a pleasant attitude toward writing, and low writing anxiety (Fathi and Rahimi, 2022).

The literature on collaborative writing has highlighted the importance of peer interaction in improving writing performance among L2 learners (e.g., Li and Zhu, 2013; Bikowski and Vithanage, 2016). However, despite the numerous studies that have examined the impact of collaborative writing on L2 writing development (Storch, 2013), there remains a need for research that explores the effectiveness of different online collaborative writing tools in facilitating this process. Specifically, there is a dearth of studies that investigate the impact of using Tencent Docs for online collaborative writing instruction in L2 writing instruction. This study aims to fill this research gap by examining the impact of using Tencent Docs for online collaborative writing and peer-editing tasks on Chinese EFL learners' writing performance, writing self-efficacy, and writing motivation. The purpose of this study is to investigate whether the use of Tencent Docs as a collaborative writing tool can result in greater improvements in writing performance, writing self-efficacy, and writing motivation than traditional face-to-face collaborative writing instruction.

Methods

Participants

A total of 58 intermediate Chinese EFL learners, selected via convenience sampling method, participated in this study. The participants were students of two intact classes and were assigned to two groups, with 30 participants in the experimental group and 28 participants in the control group. These participants were a mix of male and female students, and the age range was between 18 and 22 years. The study was conducted at a language school located in in mainland China. All participants had prior learning experience in English, with their native language being Mandarin Chinese. In order to ensure homogeneity among the participants, a DIALANG test[1] was

administered to them. Only those participants whose proficiency level, as assessed by the DIALANG test, was B1 (intermediate) were included in the study.

Instruments

Writing performance test

A standardized writing test was administered to assess the writing performance of the participants. The test consisted of a prompt and a writing task that was designed to measure the participants' ability to generate ideas, organize their thoughts, and produce a well-written piece of text. The pre- and post-test writing assessments each consisted of a writing prompt, which required participants to write argumentative essays. The writing prompts and the duration of writing (40 min) were selected from the Independent Writing section of the TOEFL internet-based test. Both prompts were related to foreign language learning, aligning with the theme of the Tencent Docs-based collaborative writing tasks. The questions aimed to evaluate participants' ability to express their opinions and support them with specific reasons and evidence, which would reflect any improvements made through writing argumentative essays in the Tencent Docs-based collaborative writing tasks. It is worth noting that these tasks were independent of the four treatment writing tasks which were completed during the writing course.

Pre-test prompt: Do you think it is necessary for children to learn foreign languages in primary school? Why or why not? Use specific reasons and evidence to support your answer.

Post-test prompt: Some people believe that the best way to learn a foreign language is to immerse oneself in a country where the language is spoken, while others think that learning through technology is just as effective. What is your opinion and why? Use specific reasons and evidence to support your preferred choice.

Writing self-efficacy scale

In this study, the Writing Self-Efficacy Scale (see Appendix A) constructed by Han and Hiver (2018) was applied to assess the writing self-efficacy of EFL students. The scale, consisting of seven items adapted from Mills et al. (2006), aimed to evaluate the confidence and beliefs of the L2 students in their writing skills. The scale was designed in the form of a 5-point Likert questionnaire, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." The reliability of the scale was determined using Cronbach's Alpha and was reported to be 0.83.

Writing motivation scale

The scale used in the study was the L2 Writing Motivation Scale (see Appendix B) developed by Waller and Papi (2017). This scale includes seven items related to L2 writing motivation, developed based on other general L2 motivation scales created by Taguchi et al. (2009). The scale encompasses statements related to the motivation of L2 writers in learning the language, their desire, and their motivation intensity. Each item was rated on a 6-point Likert scale, ranging from 1 (never) to 6 (always). The reliability of the scale, calculated using Cronbach's Alpha, was 0.81 in the present research.

Application

The experimental group used Tencent Docs for online collaborative writing and peer-editing tasks outside of the classroom.

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1 http://dialangweb.lancaster.ac.uk

Tencent Docs is a free, multi-functional office suite developed by Tencent, a Chinese multinational conglomerate. This application provides features such as document collaboration, real-time co-authoring, and revision history, which were ideal for the needs of the experimental group. The control group did not use any online writing tool, and their writing instruction was limited to in-class activities and homework assignments.

Procedure

The writing program, which was conducted over a duration of 13 weeks, involved both the experimental and control groups receiving in-class instruction. The course was structured according to the principles of the process approach and was taught by a single educator, who employed the same materials and curriculum for both groups. The primary objective of the course was to introduce the students to various forms of paragraphs, including descriptive and process, opinion, comparison/contrast, and solution paragraphs.

The students in the experimental group received in-class instruction and were required to use Tencent Docs for online collaborative writing and peer-editing of their written tasks outside the classroom. The writing process started in the classroom, where each student wrote the first draft of their written task. The peer-editing process took place outside the classroom, where students shared their work on Tencent Docs and received feedback and comments from their peers. The students were divided into groups of four or five and were instructed to share comments and peer-edit each other's written work on Tencent Docs. Each group collaborated on one single writing assignment. The students wrote their first draft individually and shared it with their peers on Tencent Docs. They then provided feedback and made suggestions on each other's writing by leaving comments on the document, and also used the "Track Changes" feature to directly edit the document. After receiving feedback from their peers, the students revised their writing and produced a second draft, which they shared with their peers for further feedback. This process continued until the final draft was written. In this process, they received peer feedback and edited each other's writing based on the components of content, organization, language use, vocabulary, and mechanics.

The students in the control group were also divided into groups of four or five and were required to engage in peer-editing in a collaborative way. However, they did not use any technology devices such as Tencent Docs. Instead, they performed the peer-editing process by physically exchanging their written work and providing each other with feedback and comments. In both groups, the participants were first introduced to the process of peer-editing and collaborative writing. The educator furnished the students with an exemplar video in which a professional evaluator demonstrated the complete procedure of peer-reviewing a written document. The students were also given comprehensive explanations of the aspects of writing by the educator. The students in both groups went through several drafts of their written work, starting with the first draft and receiving feedback, before finally producing the final draft. The teacher and peers provided feedback on each draft until the final draft was written.

To ensure consistency in the peer-editing process, both the experimental and control groups received training on how to give feedback in class. The teacher provided guidance on how to identify areas for improvement in their peers' writing and how to provide constructive feedback. The students were also given a rubric that outlined the different aspects of writing, such as content, organization, language use, vocabulary, and mechanics, to guide them in their peer-editing.

In terms of the frequency and number of feedback provided for each group, each student in the experimental group received feedback from three to four peers, while each student in the control group received feedback from four to five peers. The number of feedback provided was not significantly different between the two groups. In total, the students in both groups completed four writing tasks during the 13-week writing program. For each writing task, the students were given a minimum of 2 weeks to complete, and the students in both groups spent approximately the same amount of time on each task.

Data analysis

To assess the effect of online collaborative writing instruction on writing performance, writing motivation, and writing self-efficacy, three ANCOVAs were conducted. The first ANCOVA was conducted to compare the writing performance scores between the experimental group and the control group. The second ANCOVA was conducted to compare the writing motivation scores between the two groups. The third ANCOVA was conducted to compare the writing self-efficacy scores between the two groups. The results of the ANCOVAs were reported using means, standard deviations, and effect sizes, and the level of significance was set at $p < 0.05$.

Also, the writing scoring rubric developed by Jacobs et al. (1981) was used to assess the writing performance of the participants in both the pre-test and post-test. This analytical scoring technique considers various criteria, including content, organization, vocabulary use, language use, and mechanics, in order to score an essay. To validate the scoring process, a trained rater was assigned to score a third of the written tasks, and the results were compared with those of the primary rater. Both raters were blind to the experimental treatment to prevent any potential bias in the scoring process. More precisely, neither the primary rater nor the trained rater knew which group the participants belonged to, whether they were in the experimental or control group. This blinding process aimed to reduce the potential for systematic errors or biases in the scoring process. The Cohen's Kappa inter-rater reliability test indicated a high degree of consistency in the scoring process, with a reliability index of 0.84.

Results

First, descriptive statistics were calculated for the participants' scores on pre- and post-tests of the dependent variables (as seen in Table 1). Then the researcher used ANCOVA to compare the effects of two types of EFL writing instruction (online collaborative course and traditional) on the writing performance, as well as its sub-scales, writing motivation, and writing self-efficacy of the EFL students. ANCOVA is appropriate for this research because it allows the researcher to control for any pre-existing differences between the groups by using the scores on the pre-tests as a covariate. By doing so,

TABLE 1 Descriptive statistics of writing skills, holistic writing, writing motivation, and writing self-efficacy for both groups.

	Group	N	Mean	Std. deviation	Std. error mean
Content1	Experimental	30	13.0050	2.31466	0.42260
	Control	28	12.7500	1.96968	0.37223
Content2	Experimental	30	17.1998	3.34222	0.61020
	Control	28	14.1736	2.57358	0.48636
Organization1	Experimental	30	11.5259	1.52394	0.27823
	Control	28	11.2054	1.49574	0.28267
Organization2	Experimental	30	15.6060	2.77759	0.50712
	Control	28	13.5750	2.80339	0.52979
Language1	Experimental	30	13.2548	1.75253	0.31997
	Control	28	12.8862	1.72010	0.32507
Language2	Experimental	30	16.8192	2.33682	0.42664
	Control	28	14.5487	1.98730	0.37556
Vocabulary1	Experimental	30	7.9817	2.22261	0.40579
	Control	28	7.4118	2.54629	0.48120
Vocabulary2	Experimental	30	10.1829	2.71970	0.49655
	Control	28	8.3430	2.69091	0.50853
Mechanics1	Experimental	30	5.2867	1.40975	0.25738
	Control	28	5.6596	1.50777	0.28494
Mechanics2	Experimental	30	7.0539	1.78201	0.32535
	Control	28	5.9907	1.89296	0.35774
Writing[1]1	Experimental	30	54.4833	9.32967	1.70336
	Control	28	56.2143	12.18790	2.30330
Writing2	Experimental	30	69.9000	10.20260	1.86273
	Control	28	63.9286	12.16226	2.29845
Motivation1	Experimental	30	18.4667	4.41770	0.80656
	Control	28	19.7500	2.82023	0.53297
Motivation2	Experimental	30	24.2833	4.26631	0.77892
	Control	28	21.3929	2.76338	0.52223
Self.efficacy1	Experimental	30	19.9833	4.56464	0.83339
	Control	28	20.8571	3.24852	0.61391
Self.efficacy2	Experimental	30	28.8833	7.72555	1.41049
	Control	28	23.0893	3.90644	0.73825

[1]It refers to holistic writing.

the researcher can determine if any observed differences in writing performance, writing motivation, and writing self-efficacy can be attributed to the type of instruction received and not to pre-existing differences between the groups.

Table 1 shows the descriptive statistics of writing subscales, holistic writing, writing motivation, and writing self-efficacy for both experimental and control groups. For content, the pre-test mean score for experimental group (M = 13.01, SD = 2.31) was slightly higher than the control group (M = 12.75, SD = 1.97). However, for content post-test, the mean score for the experimental group (M = 17.19, SD = 3.34)

was higher than the control group (M = 14.17, SD = 2.57). In terms of organization, the mean score for experimental group on the pre-test (M = 11.52, SD = 1.52) was slightly higher than the control group (M = 11.20, SD = 1.49). Nevertheless, for organization post-test, the mean score for the experimental group (M = 15.60, SD = 2.77) was substantially higher than the control group (M = 13.57, SD = 2.80). Concerning language use, the pre-test mean score for experimental group (M = 13.25, SD = 1.75) was slightly higher than the control group (M = 12.88, SD = 1.72). However, for language post-test, the mean score for the experimental group (M = 16.81, SD = 2.33) was significantly greater than the control group (M = 14.54, SD = 1.98).

Regarding vocabulary, the mean score for experimental group on the pre-test (M = 7.98, SD = 2.22) was not much higher than the control group 1 (M = 7.41, SD = 2.54). For vocabulary post-test, the mean score for the experimental group (M = 10.18, SD = 2.71) was significantly higher than the control group (M = 8.34, SD = 2.69). For mechanics, the mean score for experimental group on the pre-test (M = 5.28, SD = 1.40) was similar to the control group 1 (M = 5.65, SD = 1.50). Nonetheless, for mechanics post-test, the mean score for the experimental group (M = 7.05, SD = 1.78) was greater than the control group (M = 5.99, SD = 1.89). As for holistic writing, the mean score for the experimental group on the post-test (M = 69.90, SD = 10.20) was significantly higher than the control group (M = 63.92, SD = 12.16).

Also, the mean scores for writing motivation pre-test were 18.46 (SD = 4.41) and 19.75 (SD = 2.82) for the experimental and control groups, respectively. For writing motivation post-test, the mean scores were 24.28 (SD = 4.26) for the experimental group and 21.39 (SD = 2.76) for the control group. The mean scores for writing self-efficacy pre-test were 19.98 (SD = 4.56) and 20.85 (SD = 3.24) for the experimental and control groups, respectively. Finally, the mean scores for writing self-efficacy post-test were 28.88 (SD = 7.72) for the experimental group and 23.08 (SD = 3.90) for the control group.

In ANCOVA analysis, the results were adjusted for pre-existing differences between the groups by considering the scores on the pre-test as a covariate. The independent variable in the analysis was the type of intervention (online collaborative or traditional), while the dependent variable consisted of scores on holistic writing performance, as well as its sub-tests, motivation, and self-efficacy obtained after the completion of the treatment. Prior to conducting the ANCOVAs, various validity tests were performed to verify that the data met the conditions of normal distribution, linearity, equal variances, equal regression slopes, and accurate measurement of the covariate.

The results of the analysis of the effect of the online collaborative writing course on students' L2 writing performance showed that the writing performance of the experimental group improved significantly more than that of the control group. The writing performance mean score of the experimental group increased from 54.48 on the pre-test to 69.90 on the post-test, while the pre-test mean score of the control group increased from 56.21 to 63.92 on the post-test. However, after controlling for pre-test scores (see Table 2), the difference between the two groups was found to be statistically significant [$F(1, 55) = 10.44$, $p = 0.002$, partial eta squared = 0.16]. This suggests that the online collaborative writing course was effective in enhancing the students' holistic writing performance.

Additionally, to examine the effect of the online collaborative writing on the writing sub-scales, a series of ANCOVAs were

TABLE 2 The results of ANCOVA on holistic writing performance.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Pre writing	3119.936	1	3119.936	44.082	0.000	0.445
Group	739.104	1	739.104	10.443	0.002	0.160
Error	3892.621	55	70.775			

TABLE 3 Results of ANCOVA for writing content.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Content1	376.602	1	376.602	164.168	0.000	0.749
Group	106.718	1	106.718	46.521	0.000	0.458
Error	126.170	55	2.294			

performed. The results in Table 3 show that there is a significant effect of group on the content component of writing, $F(1, 55) = 46.521$, $p < 0.001$, partial eta squared = 0.458, providing evidence that online collaborative writing instruction has a positive effect on enhancing the content component of writing, and this effect is statistically significant even after controlling for the pretest score.

The results of ANCOVA for writing organization are presented in Table 4. The main effect of Group was also significant, $F(1, 55) = 9.086$, $p = 0.004$, partial eta squared = 0.458 = 0.142, indicating that there was a significant difference between the experimental and control groups in writing organization, with the experimental group outperforming the control group.

Table 5 shows the results of the ANCOVA to examine the effect of online collaborative writing instruction on writing language use, with language use pre-test scores as a covariate. The main effect of group was also significant, $F(1, 55) = 65.549$, $p < 0.001$, partial $\eta^2 = 0.544$, suggesting that the experimental group outperformed the control group in writing language use. The effect size was moderate. The interaction effect between language use pre-test scores and group was not significant, $F(1, 55) = 0.072$, $p = 0.790$, partial $\eta^2 = 0.001$, indicating that the effect of the online collaborative writing instruction on writing language use was not influenced by the initial language use ability of the participants.

Based on the results presented in Tables 6, a significant main effect of vocabulary was observed, $F(1, 55) = 762.696$, $p < 0.001$, partial $\eta^2 = 0.933$. Additionally, a significant main effect of group was observed, $F(1, 55) = 42.035$, $p < 0.001$, partial $\eta^2 = 0.433$. The Type III Sum of Squares for vocabulary1 was 382.436, indicating that the variation in writing vocabulary scores could be attributed to the independent variable. The Type III Sum of Squares for group was 21.078, indicating that the group factor accounted for some of the variance in writing vocabulary scores. The error term was 27.578.

A one-way ANCOVA was performed to determine the effect of the writing intervention program on writing mechanics. The results are presented in Table 7. The main effect of Mechanics1 was statistically significant, $F(1, 55) = 496.886$, $p < 0.001$, with a large effect size, partial eta squared = 0.900. This indicates that the writing

intervention program had a significant effect on the participants' writing mechanics scores. Additionally, the main effect of Group was also statistically significant, $F(1, 55) = 94.776$, $p < 0.001$, with a moderate effect size, partial eta squared = 0.633, suggesting that there were significant differences in writing mechanics scores between the two groups. The interaction between Mechanics1 and Group was not statistically significant, $F(1, 55) = 1.426$, $p = 0.237$, indicating that the effect of the writing intervention program did not differ significantly between the two groups in terms of writing mechanics.

Based on the data analysis, which included descriptive statistics and ANCOVA, the results of this study suggest that the online collaborative writing instruction significantly contributed to enhancing the holistic writing and its sub-scales including content, organization, language use, vocabulary, and mechanics. Therefore, it can be concluded that the intervention had a positive impact on various writing components and can be considered as an effective approach to enhance students' writing performance.

Concerning the effect of online collaborative writing instruction on EFL learners' L2 writing motivation, the descriptive statistics (Table 1) revealed that the pre-test mean score for the experimental group was 18.46 and increased to 24.28 on the post-test, while the pre-test mean score for the control group was 19.75 and increased to 21.39 on the post-test. However, after taking into consideration the pre-test scores of writing motivation, a significant difference was found between the two groups on post-test scores, as shown in Table 8 [$F(1, 55) = 12.88$, $p = 0.001$, partial eta squared = 0.19]. This result implies that the experimental group's writing motivation improved more significantly than the control groups, implying the effectiveness of the online collaborative writing course in promoting writing motivation among students.

Finally, according to the descriptive statistics in Table 1, the writing self-efficacy score for the control group increased from a pre-test mean score of 20.58 to a post-test mean score of 23.08. Meanwhile, the writing self-efficacy score for the experimental group rose from a pre-test mean of 19.98 to a post-test mean of 28.88. Further analysis through ANCOVA, taking into consideration the pre-test scores of writing self-efficacy, showed a statistically significant difference in the post-test scores of writing self-efficacy between the two groups, with $F(1, 55) = 17.36$, $p = 0.000$, and partial eta squared = 0.24 (see Table 9). This result implies that the online collaborative writing course had a positive impact on the writing self-efficacy of the students.

Discussion

The present study sought to examine the effect of online collaborative writing using Tencent Docs on the writing performance, writing motivation, and writing of Chinese EFL learners. The results of the data analysis for this quasi-experimental design indicated that online collaborative writing instruction improved L2 writing performance of EFL learners. This outcome is in line with empirical research evidence reported in the literature (e.g., Aydın and Yıldız, 2014; Bikowski and Vithanage, 2016; Lai et al., 2016; Li, 2018; Kang and Lee, 2019; Hsu, 2020; Selcuk et al., 2021; Teng, 2021; Fathi and Rahimi, 2022; Jiang and Eslami, 2022; Rahimi and Fathi, 2022), which highlighted the significant role of

TABLE 4 Results of ANCOVA for writing organization.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Organization1	207.926	1	207.926	50.157	0.000	0.477
Group	37.666	1	37.666	9.086	0.004	0.142
Error	228.002	55	4.145			

TABLE 5 Results of ANCOVA for writing language use.

Source	Type III sum of squares	Df	Mean Square	F	Sig.	Partial eta squared
Language1	224.060	1	224.060	301.055	0.000	0.846
Group	48.785	1	48.785	65.549	0.000	0.544
Error	40.934	55	0.744			

online collaborative writing in enhancing writing outcomes. This finding lends more credit to the idea that the use of online tools, such as Tencent Docs, can play a valuable role in enhancing writing skills among EFL learners (Cancino and Panes, 2021). The technology-enhanced writing environment may provide opportunities for real-time collaboration, revision, and feedback, which can positively impact writing performance (Pham, 2020; Barrot, 2021). Additionally, the use of Tencent Docs may increase the accessibility and frequency of writing activities, leading to more writing opportunities and experiences (Lin et al., 2022). Tencent Office offers the possibility of giving and receiving peer evaluation, instead of writing solely for teachers, students were writing for a large audience, and this may lead them to keep their efforts to produce better drafts feedback (Pham and Usaha, 2016; Cho, 2017; Ebadi and Rahimi, 2017). Additionally, the use of Tencent Docs may increase the accessibility and frequency of writing activities, leading to more writing opportunities and experiences (Lin et al., 2022). Tencent Office offers the possibility of peer evaluation, allowing students to receive feedback from a large audience instead of writing solely for their teachers. This may motivate students to put more effort into producing better drafts and seeking feedback to improve their writing skills (Pham and Usaha, 2016; Cho, 2017; Ebadi and Rahimi, 2017). However, it is important to note that while peer evaluation can enhance students' feedback practices, it is the writing instruction and the teacher's guidance that can ultimately lead to improved writing performance (Hedgcock and Lefkowitz, 1996). Therefore, incorporating Tencent Docs into writing instruction should be accompanied by effective teaching strategies and teacher support to maximize its potential benefits for students' writing development.

Furthermore, the use of Tencent Docs may enhance collaborative learning and increase the accessibility and frequency of writing activities, providing students with more opportunities to practice their writing skills (Lin et al., 2022). Tencent Office also facilitates peer evaluation, which allows students to receive feedback from their peers and write for a larger audience (Pham and Usaha, 2016; Cho, 2017; Ebadi and Rahimi, 2017). This process encourages students to engage in more critical thinking and self-reflection, leading to the production of higher quality writing samples (Cho, 2017; Ebadi and Rahimi,

2017). Therefore, the use of Tencent Docs can promote both writing performance and feedback practice, providing a comprehensive approach to writing instruction.

As a result, a more engaging and interactive writing place can be found in the Tencent Office environment and individuals were more inspired to publish higher-quality writing drafts. In addition, as this online collaborative learning environment removes the time and place limitation (Yang, 2010; Wang, 2015; Xu et al., 2019), students may have more opportunities for writing practice, brainstorming, reviewing, and revising their writing beyond the class walls. This positive effect of online collaborative writing has been acknowledged in the literature (e.g., Bikowski and Vithanage, 2016; Reinhardt, 2019; Barrot, 2021; Su and Zou, 2022). Moreover, the students' overall positive attitudes toward using online collaborative learning platforms in L2 learning contexts might have enhanced their writing performance. Likewise, Zhou et al. (2012) revealed that students had positive attitudes toward communicating with numerous peers on Google Docs, therefore, they focused more on the quality of their written assignments and as a result, their writing performance improved. In partial agreement with Seyyedrezaie et al. (2016), the results showed that the writing process in the Google Docs environment significantly affected students' writing abilities and writing performance. Overall, the use of Tencent Docs provides a number of features and tools that can support and facilitate the writing process, including text-to-speech functions, spell checking, and thesaurus tools, which can help learners to improve their writing accuracy and fluency.

Second, the results revealed that online collaborative writing instruction using Tencent Docs improved L2 writing motivation. This result is in accordance with the findings of some previous studies (e.g., Yang, 2010; Liu and Lan, 2016; Mudawe, 2018; Yousefifard and Fathi, 2021). Since writers communicate, express themselves, and appeal to people while using Tencent, writing motivation is crucial and students with writing motivation had high levels of effort, desire to write, as well as positive attitudes about writing. In line with what Godwin-Jones (2018) concluded, it was revealed that students' motivation and higher-order thinking abilities were increased through online collaborative peer editing. Using Tencent, students were willing to continue writing, and invest a large amount of time, resulting in higher writing motivation. Also, in harmony with what Yang (2010) claimed, as a result of the using online collaborative writing, which helps students to work on writing assignments without being limited by time or location, increases students' motivation. In addition, Tencent provided a motivating environment (Mudawe, 2018; Luo et al., 2022) for students to freely edit and revise their drafts, communicate and share ideas. Generally, it was revealed that with the use of online collaborative writing, students had a more positive

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Vocabulary1	382.436	1	382.436	762.696	0.000	0.933
Group	21.078	1	21.078	42.035	0.000	0.433
Error	27.578	55	0.501			

Source	Type III sum of squares	df	Mean Square	F	Sig.	Partial eta squared
Mechanics1	170.021	1	170.021	496.886	0.000	0.900
Group	32.430	1	32.430	94.776	0.000	0.633
Error	18.820	55	0.342			

attitude toward writing and experienced higher levels of motivation to write (Liu and Lan, 2016). This finding also aligns with previous research, which has demonstrated that the use of technology in the language learning process can increase learners' motivation and engagement (Sun and Gao, 2020; Su and Zou, 2022). The use of Tencent Docs provided a dynamic and interactive environment (Ng et al., 2022) that can enhance learners' writing motivation by making the writing process more enjoyable and interesting. In other words, the online environment may provide a more engaging and interactive writing experience, as well as opportunities for receiving feedback and recognition from peers and instructors, which can boost writing motivation.

Third, the findings indicated that online collaborative writing instruction improved L2 writing self-efficacy of the participants. This finding supports the idea that the use of online collaborative writing tools, such as Tencent Docs, can enhance writing self-efficacy beliefs among EFL learners. In line with Rahimi and Fathi (2022), it can be argued that the online collaborative learning environment may provide opportunities for real-time collaboration, revision, and feedback, which can increase the confidence and competence of EFL learners in writing. Following Lee and Evans (2019), it can be argued that the further feedback and comments on tasks provided by Tencent Office might have enhanced writing self-efficacy of the participants. It is important to note that the software allows for real-time collaborative writing and editing, as well as the option for peer review and feedback. With the peer review feature, students are able to provide feedback and suggestions to each other, which can enhance their sense of self-efficacy as they feel more in control of their learning and confident in their ability to produce quality work. Additionally, the software provides a variety of tools and resources, such as templates and formatting options, which can assist students in the writing process and boost their confidence in their ability to complete writing tasks. These features of Tencent Docs may have contributed to the enhancement of writing self-efficacy among the participants. Additionally, the online environment may provide access to a wider range of writing resources and materials, which can further enhance writing

self-efficacy beliefs. This finding is also in harmony with the theoretical notion of self-efficacy construct (e.g., Schunk and Zimmerman, 2012; Piniel and Csizér, 2015).

Following Lee and Evans (2019), it can be argued that the further feedback and comments on tasks provided by Tencent Office might have enhanced writing self-efficacy of the participants. Tencent Docs offers a range of collaborative features, including the ability to share documents, comment on others' writing, and receive feedback from peers and instructors. The software also provides a built-in spell checker, grammar checker, and word count tool, which may help students improve the accuracy and fluency of their writing. In addition, the online environment provides access to a wider range of writing resources and materials, such as online dictionaries, thesauruses, and writing guides, which can further enhance writing self-efficacy beliefs. This finding is also in harmony with the theoretical notion of self-efficacy construct (e.g., Schunk and Zimmerman, 2012; Piniel and Csizér, 2015).

To clarify the feedback and comments provided by Tencent Docs, it is important to note that the software allows for real-time collaborative writing and editing, as well as the option for peer review and feedback. With the peer review feature, students are able to provide feedback and suggestions to each other, which can enhance their sense of self-efficacy as they feel more in control of their learning and confident in their ability to produce quality work. Additionally, the software provides a variety of tools and resources, such as templates and formatting options, which can assist students in the writing process and boost their confidence in their ability to complete writing tasks. These features of Tencent Docs may have contributed to the enhancement of writing self-efficacy among the participants.

As a result of having strong self-efficacy beliefs, students' interest in writing was substantially boosted. Self-efficacious students had pleasant attitudes toward writing assignments, low writing anxiety (Fathi and Rahimi, 2022), and a high level of enthusiasm for doing writing tasks. It can be argued that students who have high self-efficacy beliefs are more likely to set challenging goals, demonstrate a

TABLE 8 The results of ANCOVA on writing motivation.

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Pre motivation	80.236	1	80.236	6.750	0.012	0.109
Group	153.217	1	153.217	12.889	0.001	0.190
Error	653.784	55	11.887			

TABLE 9 The results of ANCOVA for writing self-efficacy.

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Pre self-efficacy	329.830	1	329.830	10.006	0.003	0.154
Group	572.499	1	572.499	17.367	0.000	0.240
Error	1813.038	55	32.964			

strong commitment to achieving them, and persevere in the face of obstacles. Furthermore, they may be better equipped to bounce back from setbacks and failures, as they are more likely to maintain their confidence and motivation. Such findings are consistent with the notion that self-efficacious students tend to approach academic tasks with a positive attitude and a willingness to invest effort in their learning (Piniel and Csizér, 2015).

These findings are aligned with the conclusion drawn by Pajares (2003) that the writing self-efficacy beliefs of L2 learners can have an impact on all other dimensions of their learning performance. Therefore, it can be concluded that a significant interplay can be found between self-efficacy beliefs and students' performance on writing activities, because self-efficacious writers showed a positive attitude toward writing assignments, as well as a low level of anxiety when writing, resulting in enhanced writing performance. With the use of online collaborative writing, students had a better sense of themselves and their writings, and felt less anxious (Abrams, 2016, 2019; Fathi et al., 2019), which resulted in improved self-efficacy. Besides, as online collaborative writing improved students' writing performance significantly, they felt more interested and motivated as a result of getting positive achievements. In other words, as students were motivated enough to put efforts into their writing process, their writing ability and creativity boosted significantly (Zhang et al., 2014; Yu et al., 2020). From a broader perspective, this finding supports previous research, which has indicated that the use of technology in the writing process can increase learners' self-efficacy and confidence in writing (Lai et al., 2016; Li et al., 2020; Jiang and Eslami, 2022; Rahimi and Fathi, 2022). In fact, the use of Tencent Docs provided a supportive and user-friendly environment that can help learners to overcome writing challenges and feel more confident in their writing abilities. Overall, the results of the present study indicated the potential benefits of using Tencent Docs in the writing instruction of Chinese EFL learners. It was found that the

use of this technology can positively impact writing performance, writing self-efficacy, and writing motivation.

Conclusion

This study tried to investigate the effect of online collaborative writing using Tencent Docs on the writing performance, writing motivation, and writing self-efficacy of Chinese EFL learners. Having utilized a pre-test and post-test design with an experimental group and a control group, the researcher found that the use of Tencent Docs significantly improved the writing performance, writing self-efficacy, and writing motivation of the participants in the experimental group. These findings can contribute to the development of new teaching practices and technology-enhanced language learning programs, and can help to improve the writing skills of Chinese EFL learners. The results of this study support the idea that technology-enhanced writing instruction can have a positive impact on the writing skills of EFL learners. The use of Tencent Docs helped the participants to produce higher quality writing samples, which suggests that this software can provide valuable resources for improving writing skills. Furthermore, the positive impact on writing self-efficacy verifies the potential of technology-enhanced writing instruction to promote learner autonomy and self-directed learning. The findings might also have important implications for language teachers and educational institutions. By incorporating Tencent Docs into writing instruction, language teachers can provide students with a user-friendly and engaging tool that can enhance their writing performance, self-efficacy, and motivation. Furthermore, the results of this study suggest that the use of Tencent Docs can be particularly beneficial for Chinese EFL learners, who often struggle with writing skills in English.

The findings of this study have significant implications for the broader area of L2 writing literature and technology-enhanced writing instruction. By demonstrating the positive effects of online collaborative writing using Tencent Docs on writing performance, writing self-efficacy, and writing motivation, this study contributes to the growing body of research that advocates for the use of technology in language learning. The use of technology in writing instruction can enhance learners' engagement, motivation, and autonomy by providing a platform for collaborative learning and feedback, as well as by offering a range of tools and resources to support writing skills development. The outcomes of this research also shed light on the significance of teacher training in technology-enhanced writing instruction, as teachers need to be equipped with the necessary skills and knowledge to effectively integrate technology into their teaching practices. Furthermore, the study highlights the importance of developing learner autonomy and self-directed learning in language education. Via employing technology such as Tencent Docs, EFL learners can engage in more independent and interactive writing activities, which can foster their self-efficacy and motivation for writing.

However, the present study might have some limitations that should be taken into consideration. Firstly, the sample size was relatively small, and future researcher could benefit from a larger

sample size to increase the generalizability of the findings. Secondly, the study was conducted over a short time frame, and the impact of Tencent Docs on writing skills over a longer period of time should be explored in future studies. Finally, the study only examined the use of Tencent Docs in an English writing context, and future research could benefit from exploring its impact in other writing tasks, such as composing in Chinese.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the author, without undue reservation. Requests to access these datasets should be directed to YL, yanlee200909@163.com.

Ethics statement

The studies involving human participants were reviewed and approved by School of English Studies, Xi'an International Studies University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendices

Appendix A. L2 writing self-efficacy scale.

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	I feel confident about writing in English.				
2	I know how to write well in English.				
3	I write in English with an underlying logical organization.				
4	If I put in the needed effort, I am sure I can become a good writer in English.				
5	I can write essays that are relevant and appropriate to the assignment.				
6	I present my point of view or arguments accurately and effectively when writing in English.				
7	I am sure I can do well on writing courses even if they are difficult.				

Appendix B. Writing Motivation Scale.

Items	Never	Rarely	Sometimes	Often	Always
1	I enjoy writing in English.				
2	Writing in English is very important to me.				
3	I always look forward to my ESL writing classes.				
4	I would like to spend lots of time learning to write in English.				
5	I would like to concentrate on learning to write in English more than any other topic.				
6	I actively think about what I have learned in my English writing class.				
7	I really try to learn how to write in English.				

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