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Gamification into the design of the e-3D online course

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Research in the fields of Education and Applied Linguistics points to the growth of studies on digital games and gamification in Brazil. On the other hand, studies that discuss digital teaching material do not provide guidelines on how to implement gamification into the design of digital teaching materials, mainly in language studies. Thus, this work presents practical guidelines for how to explore gamification in the design of language teaching materials based on the experience developed in the outreach project laboratory of online language teaching and learning at the Federal University of Santa Maria. This research reports a case study carried out in the English online 3D course offered in the modality of distance education. To exemplify how the gamification strategies have been implemented, we provide examples from the course's material as well as bring the user's evaluation about participating in a gamified online course. Results indicate that gamification strategies were underpinned by exploring mainly intrinsic and extrinsic gamification strategies included in the digital material design, as well as by tools used on Moodle Platform to get the students engaged in the language learning process. On the other hand, this empirical study has shown the necessity of including more narrative strategies into the content proposed in the online course as an alternative to getting the students to explore meaningful learning by problem-solving in branching scenarios proposed inside the Moodle platform.

KEYWORDS

English online 3D, Gamification, teaching material design, Moodle, English as an additional language, distance education

1. Introduction: background and rationale for the educational activity innovation

Gamification strategies have been discussed in several studies published in the field of Information Communication Technologies, Apply Linguistics, and Education, as we can read in publications proposed by Deterding et al. (2011), McGonigal (2011), Kapp (2012), Busarello (2016), Toda (2021), among others. In these studies, the focus was on highlighting the importance of exploring gamification strategies to get the students engaged to motivate them to learn by using game strategies in different teaching situations, as well as how to integrate Gamification design in educational contexts (Toda et al., 2018). However, the advances in these publications in providing theoretical support to sustain the classroom practice, when it comes to applying these concepts in real teaching practice, the results from the theory seem not to be enough to guide teachers on how to implement gamification into the language classroom.

To complement these ideas, as suggested by Toda (2021), the use of gamification in the classroom should be sustained by frameworks; consequently, recent research have shown an increased number of frameworks for applying gamification in the classroom; On the other hand, there are no practical guidelines on how to apply the game's strategies to the design of digital language teaching materials, mainly we observed this gap by analyzing Brazilian Applied linguistics studies (Brasil, 2017).

In this article, we aim to describe practical guidelines for how to explore gamification in the design of language teaching materials based on the experience developed in the outreach project laboratory of online language teaching and learning (hereinafter LabEOn) at the Federal University of Santa Maria, in Brazil. To do this, this article reports a case study carried out in an online English Course and it aims to present how a gamification protocol was used in the design of an online course as an alternative to implementing gamification in the design of distance learning courses, especially for teaching English as an additional language.

1.1. Previous studies about gamification in education and applied linguistics

Research in Applied linguistics reports an increased emphasis in studies focusing on the implementation of gamification in language teaching and learning approaches based on previous studies proposed in the fields of Education and Information Technology Communication.

In Brazil, several studies have focused on discussing gamification in Education, as we can see in publications presented by Fadel et al. (2014, p. 15), among others. However, to understand what constitutes a gamified experience, firstly according to these authors, it is necessary to understand the distinction between 'playing' and 'gaming' (Deterding et al., 2011) as already defined by the authors in their previous works.

For this reason, in this article, it meant to discern the theoretical concept of gamification from games, so we bring into the discussion the definition of gamification proposed by Deterding et al. (2011, p. 2) as "the use of game design elements in non-game contexts." In addition to this, we advocate on Kapp's ideas (2012, p. 10) that gamification is more than the use of mechanics and esthetics because it has to do with considering game-based thinking elements to engage people, motivate action, promote learning, and solve problems. Besides this, we consider Toda (2021)´s recent study in which the author presents the term Gamification design (or planning). As suggested by Toda (2021) and Toda et al. (2018), "Gamification design (or planning) is characterized by a series of events that result in applying gamified strategy (which is a specific action related to game elements)."

Based on these studies, and in one attempt to explain the use of game design elements in the educational context, Erenli (2013) suggests that when it comes to how to apply the game elements in the teaching practice, it is necessary to create (or design) a scenario, which contemplates a narrative and the arrangement of game mechanisms that can contribute to the motivation of participants to perform a particular activity in the classroom. In this view, Gamification leans more toward gaming experiences, however, a core element responsible for gamification's success is how it allows involvement on both extremes depending on the approach taken by the user. However, it is worth reminding that games can consist of elements that in isolation are not intrinsically gameful nor unique to games; for example, how to provide self-representation through avatars, ranks, and narrative context (Deterding et al., 2011).

According to previous studies (Caponetto et al., 2014; Nah et al., 2014; Lopes et al., 2015; Urh et al., 2015; Danka, 2020), including these game elements in education often increases student engagement and motivation. The study by Lopes et al. (2015) investigated the elements and mechanisms that affect the design of games and highlighted the existence of intrinsic elements, "those that do not have a physical representation," but that help players feel their effects, such as the feeling of fun, competition, cooperation, personal fulfillment, stress relief, mental exercise, artistic expression, and training of psychomotor functions. Furthermore, there are the extrinsic elements, which "are visible to players," such as narrative, score, achievements, levels, and scoreboard; these types of elements provide the engagement and motivation of the player (Lopes et al., 2015, p. 169; Gomes, 2017).

With these theoretical studies in mind, we infer that gamification design should be associated with a behavior change, in search of the motivation that games provide, associating with the didactic contents and the technological resources available to the students to make meaning by getting involved in solving challenges proposed in a systematically organized and interactive way. Therefore, to explore gamification in course design, planning actions/activities that explore extrinsic and intrinsic elements in the proposed challenges is essential. This may be an alternative to immerse students in solving tasks with more autonomy and motivation, as well as make the distance teaching and learning process more meaningful, stimulating, and engaging.

In the light of mentioned studies, we sought to implement some ideas from gamification design in the development of an outreach course named English Online 3D (hereinafter E-3D)–an online English Course – offered by distance modality at the Federal University of Santa Maria (hereinafter UFSM), in Brazil. The E-3D course is proposed to undergraduate students from different academic courses at UFSM, mainly free of charge for students in social vulnerability.

To contribute to the discussion on how to implement gamification design in e-learning materials, the present article explores how to plan and integrate gamification design in the digital teaching language material of the E-3D Course. To do it, we describe the gamification strategies inserted in the content proposed of the online course as an alternative to getting the students able to explore meaningful learning by getting the students involved in problem-solving challenges on the Moodle platform. Based on these assumptions, this article reports on how game strategies have been implemented in e-learning courses offered by the online language teaching and learning Laboratory at UFSM.

2. Online learning environment: setting and participants

To explain the context where this research was developed, firstly it is important to explain about online language teaching and learning Laboratory (hereinafter LabEOn). LabEOn was an umbrella project registered in 2012 at UFSM, and nowadays is a well-established laboratory that integrates research, teaching, and outreach activities in the Languages Course. Since then, this lab is linked to Research

Group – GrPesq/CNPq Núcleo de Pesquisa, Ensino e Aprendizagem de Línguas a Distância (NuPead) (Research Center in Language Teaching and Learning at Distance) from the Federal University of Santa Maria (UFSM), where we develop research with the purpose of comprehend teaching and learning processes of additional languages in different modalities.

Based on that, at LabEOn we are concerned with teacher training for performing in different modalities, including in this training process discussions of other connected knowledge, such as digital teaching materials design, pedagogical mediation, and use of gamification strategies, among others. Examples of previous research that discuss these topics are the following publication developed by members of the research center as Reis and Gomes (2014), Reis and Gomes (2015), Gomes (2017), Reis (2017, 2021), Gomes and Reis (2018), Gomes and Reis (2019), Reis and Marchezan (2020), Reis et al. (2020), da Silva and Reis (2021), among others.

To report this present study, we used mixed methods, which focus on the design-based research (DBR) methodology along with a case study on the English Online 3D course used in this article as an example of digital artifacts produced at LabEOn to illustrate how gamification design has been implemented in online courses and to collect data for the analysis.

According to Armstrong et al. (2022, paragraph 8), DBR is a methodology that can be "conducted by designers focused on (a) understanding contexts, (b) designing effective systems, and (c) making meaningful changes for the subjects of their studies."

In this study, we report the analysis and exploration done in the E-3D course, level one, offered in the year 2022, and how the (re) design and construction of new possibilities have integrated into the digital material, aiming to evaluate and reflect upon the challenges of creating an interactive, attractive and engaging material to teach English as an additional language at a distance.

The online course under investigation is E-3D, level one. The E-3D course is available online to university students, who have different social backgrounds. The outreach activities aim mainly to achieve and to give the option to students in social vulnerability to have access to language learning by offering free courses to this specific social group. These selected students to the course have access to the classes at distance, using the Moodle platform to solve the asynchronous activities as well as to join the synchronous meetings offered twice a week to the participants. They can connect to the Internet at their houses or on the UFSM campus.

The E-3D course – level 1 – is organized into 4 stages, and according to the CEFR, it is classified into the A1 level. Its purpose is to get students to use language and explore multimodal genres and practice multiliteracies by learning the English Language.

To collect the data, empirical case studies were conducted over 2 years observing the gamification strategies applied in the course by the tutors. The tutors are pre-service language teachers who participated in the project's activities to learn how to create digital teaching material for hybrid teaching and distance education courses. The designed material of E-3D was created under the supervision of LabEOn's research leader, and it was created considering a collaborative perspective. The laboratory team responsible for creating the digital material and conducting the online classes are around eight tutors and two professors who act as advisers. The results were collected on Moodle platform during the course applied in 2022 and the online data were obtained through surveys to evaluate the user's

opinions about the effectiveness of the game's strategies applied to the course's design.

To select the data for this study, the criteria were: (a) identify the questionnaire's answers that express the personal evaluation of the participants about the use of gamification strategies; (b) save recorded classes and activities that demonstrate the student engagement and motivation using the gamification strategies; (c) consider the student's participation in the before, in class and after class activities to evaluate their performance.

The procedures to evaluate the answers were: (a) identification of the discourse of the participants collected from the questionnaires; (b) select answers that include positive or negative keywords evaluating the gamification strategies used in the course; (c) classification of discourse analysis based on the ARCS framework (Keller, 2010, 2016), aiming to identify answers that the gamification strategies call the participant's attention; answers that demonstrate how relevant were the gamification strategies applied into the course; answers that express the confidence and the satisfaction of the participants with the gamification strategies applied into the course.

3. Results and discussions

In this article, we report the experience of gamification design and highlight some data collected during the application of online courses at distance. In this analysis, we evaluate the gamification design proposed for the course e-3D, to verify to what extent the elaborated design can contribute to the engagement and motivation of participants in online distance courses, considering Filatro's (2008) concept of design and the Systemic Design with gamification Model (hereinafter Me-SIGA) proposed by Gomes (2017), Gomes and Reis (2019). Additionally, to analyze the data collected, we bear in mind the ARCS Model (Keller, 2016), which theory helps us to reflect upon how the course and the gamification design applied in the course instigated the students to participate in the activities.

Based on Filatro's (2008) definition, we understand *Design as a set of practices aimed at teaching and learning processes that vary and self-regulate, according to the approaches and technological resources employed*. From this concept, we established design with gamification as a systemic set of practical actions composed of five categories, which are: (a) the language conception adopted to guide the practices in the course; (b) the selection of didactic contents; (c) the technological resources that will be used in the design; (d) the network of peripheral connectors, and (e) the gamification system protocol created to the course. These categories were described as the Me-SIGA Model (Gomes, 2017; Gomes and Reis, 2019) which we used to support the design with gamification implemented in the online course E-3D.

The Me-SIGA model allows us to reflect upon some important decisions we made while we were creating the E-3D course. On the other hand, it is important to say that before we planned the E-3D Course design, the concept of language that sustains the course and supports teaching practice was defined from a sociocultural perspective. The concept underlying the course is understanding language as a social practice, which is realized by genres and social activities (Halliday, 1978, 1989; Motta-Roth, 2008). In a sociocultural teaching approach, we combine these concepts with the assumptions of pedagogy of genres (Rose and Martin, 2012) and multiliteracies

(Cope and Kalantzis, 2009, 2015) to promote language practice and learning by doing.

In addition, based on the categories of the Me-SIGA Model, the platform and digital tools chosen to implement the course were Moodle and its available plugins that provide dynamic and interactive design to the digital material of the course. In the case of E-3D level 1, we explored the plugin H5P available on Moodle to create the course teaching material as well as the interactive video and gamified activities available in the course.

In the E-3D course, we employed the use of gamification strategies (elements and mechanics from games), as an alternative to allow the students to interact as if they were playing and earning points and rewards for solving challenges and reaching goals. As it is an online course applied at a distance, we considered some game elements in the design of the course and used the specific vocabulary of games in digital material. Therefore, the units of the course are named phases (Stages), indicating those missions provided in the material to be completed by the students to advance in the course. At the end of a level, the student may be able to go on to the next one, provided that they have achieved a passing score by completing the challenges and also advanced in terms of learning the English language being studied. Also, for solving the proposed challenges in the different stages of E-3D, the students are rewarded with badges and titles.

FIGURE 1
Trail layout used in the course E-3D design. E-3D, level 1.

The first screen the student finds when accessing the course is shown in Figure 1, displaying the material in a trial layout aid in suggesting this is a gamified environment. New stages are unlocked during the semester as the student progresses on the stages, resembling game mechanics that require players to fulfill certain criteria – in this case, that the students learn the content of the lesson – to progress to more challenging tasks.

Additionally, in E-3D level one, this system underwent an update to include a new point system that would grant the students experience points for completing tasks before and after class, along with interacting with other students and teachers. Each course offered at LabEOn is subdivided into four levels that can be reached by the students using experience points, each level grants the student a title that is related to the narrative of the course. In level 1, a narrative was created to conduct the students through their learning journey, in which the students have a main mission and challenges to solve. To do it at the beginning of the course, the avatar named Eve introduced the narrative inviting the student to take part in this journey. During the four stages, the students review the use of the simple present and present continuous in English along the course. We use a genre-based approach to explore the language in use, so this is why we focus on the genres such as profile, ads job, online questionnaires, e-mail msg, instantaneous msg, and so on. During the stages, the students get involved in the narrative, while they review vocabulary, and read or produce texts that will make the learners involved in different social practices. In the call to the adventure, Eve calls the students to get engaged to fight against the bosses and challenges in the learning journey and requires the help of a specialized team of tutors from LabEOn to scaffold and provide feedback during this journey (Figure 2).

For instance, the first stage of the course discusses how to produce self-presentations and profiles, and at the end of the first stage, the students are supposed to achieve the title 'The Beginner," to illustrate their progress in English language acquisition based on the learning parameters established. The other four titles refer to the stages the students as players achieve by completing the challenges available in the course. In Figure 3, we present the titles and badges and the points the students are expected to get while getting involved in the course. Each title the students receive reinforces their role as the protagonist of the E-3D narrative as they build the learning story. Besides, the badges have a great function, they show that the students are doing well and motivate them to continue the learning journey.

Furthermore, other game elements and mechanics included in the E-3D course that has implemented in the gamification system, as suggested by the Me-SIGA model (Gomes and Reis, 2019) is the Gamification Protocol created to define the points and rewards system at E-3D. In the next section, we describe how we created this Gamified protocol system.

3.1. Points and rewards system at E-3D gamified protocol

At the beginning of the course, students get to know more about the *experience points (XP)* system that rewards them according to their participation in class. Interactions with the material, classmates, or teachers, be it before, during, or after class, are means by which students can obtain XP points. Later, these XP points are turned into
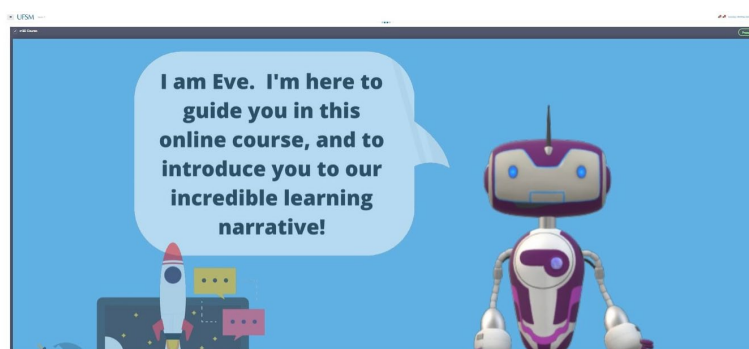
FIGURE 2
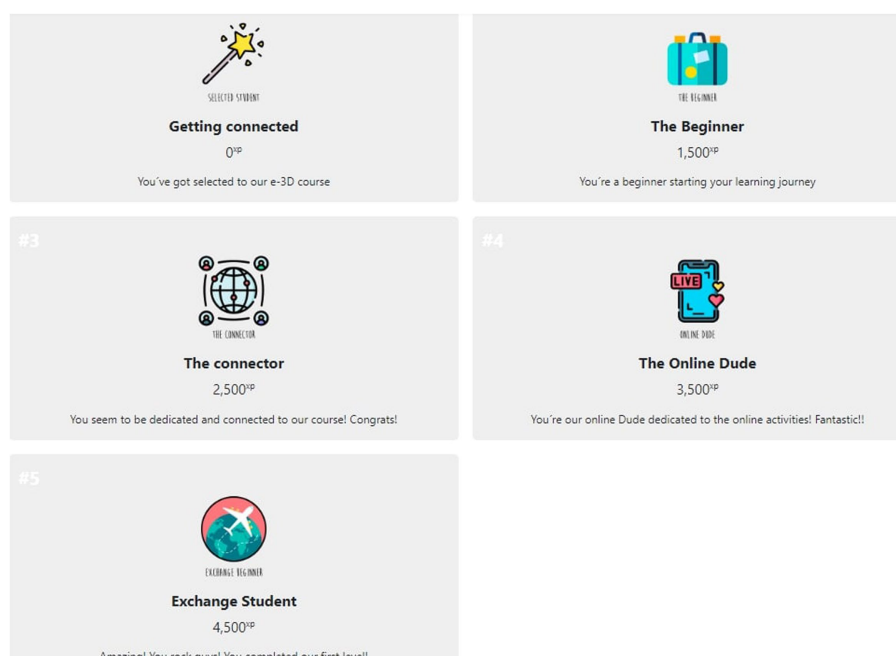E-3D narrative video. E-3D − level 1.

FIGURE 3
Badges and titles in E-3D course level one. E-3D, level 1.

rewards inside the course, symbolizing the student's success in learning the content of the lessons, such as badges, reaching new levels, or obtaining new titles. Participants of E-3D also have access to a leaderboard, which ranks students according to the number of points obtained, instigating competition.

Different types of interactions result in different amounts of XPs, ranging from 50 to 200, rewarding with greater value the actions that consist of interaction in English and solving the tasks during the class, reaching the major focus of the course, getting in contact with real situations in which you need to use the English language. An online Excel spreadsheet document named "Gamification Protocol System' was created to track the points obtained by each student throughout the course. This spreadsheet was designed to make the points system more attractive and simplified, making it easier to understand, also the colors were designed to catch the participant's attention. The spreadsheet contains a page for each student, a page that is divided into three sections:

A. Activities/Actions—This section is subdivided into three subsections: before class, during class, and after class; it includes a list of actions that result in earning experience points, the number of experience points attributed to each action, and a checkbox. In each lesson, the teacher marks the checkboxes that correspond to the action displayed by the student, and a formula automatically calculates the total of points obtained, clicking on the button 'Save' the points will be transferred to the next section here explained and the checkboxes will reset.

B. Date and total—The total amount of points obtained is transferred to this section, displaying the total points and the date on which they were obtained in two columns side by side.

There is an extra row in the 'total' column that calculates the sum of the points obtained on all dates.

C. Challenges, Moodle, gamification, and final score—This last section consists of three tables, the first one reports the total points obtained throughout the course via challenges, Moodle and the gamification system here described used to compose the student's final score. The other two tables report the total points obtained in each quarter of the course in the same structure.

According to Figure 4, the steps *before, during, and after class* was proposed to involve the participants, even to facilitate the tracking of the student's grades, both for the tutor and the learners. Thus, we observed and discussed which points are important to maintain engagement and what we wanted to improve, such as punctuality and open cameras during the online access to synchronous classes.

The main purpose of the *before-class section* is to allow students to explore the content ahead of the synchronous class, enabling them to use their prior knowledge, as well as to instigate their curiosity regarding what they would later see in class. By viewing the course materials before the class and solving the challenges, the student will earn XPs that are displayed on his/her screen as the participants/players interact with the content through Moodle's gamification system.

The synchronous classes in the e-3D course happen at what we call *during the class* step. It is important to highlight that students were encouraged to interact and collaborate with other classmates and their tutor to solve challenges proposed by the teaching material either orally or by chat, making sure to leave the camera turned on all the time during this process. Thus, the tutors could visualize how the phonemes involved in oral production were being produced. It also has the objective of engaging the students to solve in-class activities, by acting in simple ways, such as volunteering to interpret a dialog or answering the questions made by the tutors.

The after-class section is focused on the asynchronous process in such a manner that even after the class, the student remains interested in looking to clarify doubts, solve challenges and continue in touch with the language.

During course level one, students could acquire different titles at the end of four levels that would be reached by obtaining experience points, these titles related to the content of the lessons and symbolized that the student had successfully learned the topic of each stage. These titles function as a tool for rewarding students and provide them with a visual representation of the knowledge acquired, which enables them to track their progress. In addition, students had access to the number of experience points and levels reached by other students, promoting competitiveness and offering motivation for obtaining more experience points through engaging with the course.

Besides the gamification protocol, the E-3D's digital material also includes gamification strategies, since it is possible to create interactive activities that provide instant feedback. Figure 5 illustrates the integration of game visual design to multiple choice questions that compose the digital material used in E-3D courses. Instant feedback is provided in the platform using symbols and colors that represent 'correct' and 'incorrect' answers, if the student does not choose the correct answer during the first try, it is possible to click on a retry button and try again. Such visual elements could influence students' motivation, providing a sense of accomplishment at the end of each task and allowing students to keep practicing as many times as necessary to reach the correct answer.

Other possibilities to explore a game-based design are by creating flashcards and card elements to explore thematic contents and review, for example, vocabulary or everyday situations on the Moodle platform. The flashcards introduce the topic of professions. This activity aims to teach professions, focusing on teaching how to describe a profession, not just the vocabulary. It is inspired by a guessing game with card elements, where the objective is to try to guess the profession, by reading the description and looking at the
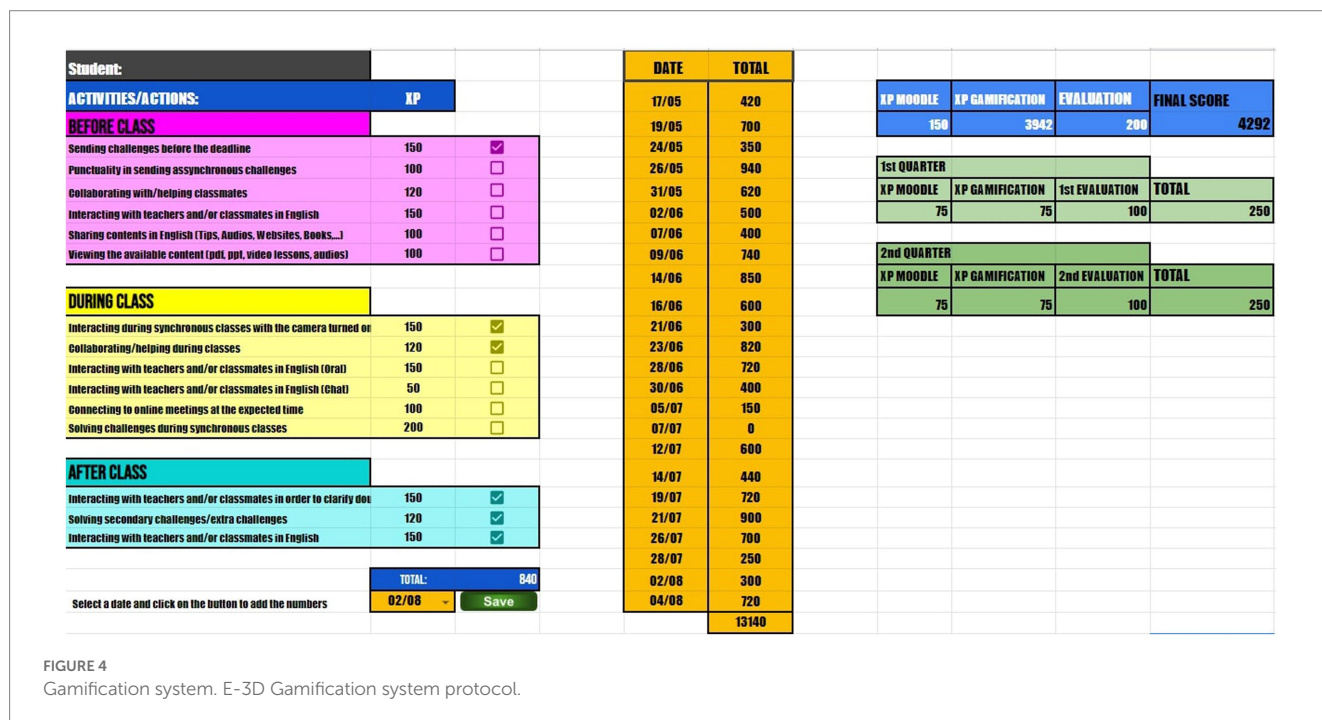

FIGURE 4
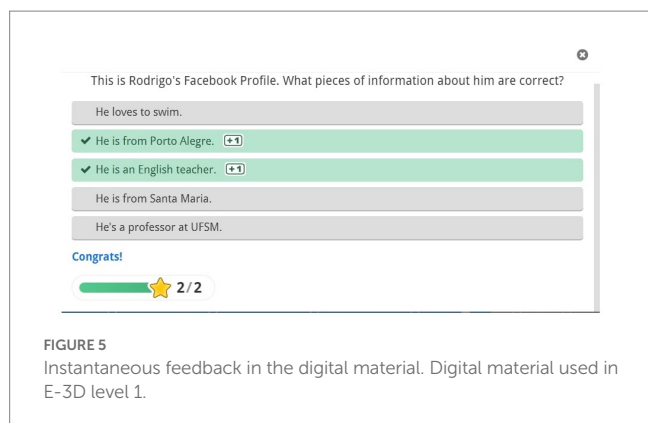Gamification system. E-3D Gamification system protocol.

FIGURE 5
Instantaneous feedback in the digital material. Digital material used in E-3D level 1.

image, when turning the card, the answer is revealed. At this moment, the learners are required to make a guess and then practice their reading skills by identifying some suggested jobs and occupations.

Another example of game-based activity is the matching and memory game, in which the learner needs to match the professional image with the vocabulary. Memory games have a great potential to develop independent thinking and the ability to solve challenges. At this moment, students can practice vocabulary by playing with cards and listening to the pronunciation of the words.

The evaluation system of E-3D considers the learner's experience by getting points during his/her learning journey and the registers are done in the gamification protocol that includes the different moments (before, in, and after class). Besides, we created the big boss as a final challenge that must be solved by the learner when s/he accomplishes the end of the last level.

The register in the leaderboard used in E-3D on Moodle reports the ranking and how the students perform during the course, registering the titles and badges obtained. In the sequence, we discuss how the users evaluate the implementation of these strategies in the course design.

According to the user's evaluation at the end of the semester, the gamification strategies are suggested as "interesting strategies to get the students engaged in the E-3d course." In the next section, we are going to discuss some results collected from the user's point of view, mainly from the group applied in the first semester of 2022.

3.2. How users evaluate the experience with the gamification strategies application

To assess to what extent, the implementation of gamification strategies had a significant contribution to the learning experience of students in the E-3D course, we proposed the evaluation questionnaire (EQ) which was applied at the end of the course, the first semester of 2022. This questionnaire is based on ARCS Model (Keller, 2016, 2017), since it aims at identifying how the course's digital material calls the participant's Attention, Relevance, Confidence, and Satisfaction. The original answers were in Portuguese, so in this article, we translate the answers into English.

According to the answers provided to EQ, regarding the teaching methodologies used in online classes, over 80% of

students gave overwhelmingly good scores on how teaching methodologies were handled in class. It reinforces that the teaching methodology adopting gamification strategies becomes meaningful to the participants since they seem to approve of it. It was possible to infer that not only the teaching material hold an important role in the teaching and learning processes of students, but also teachers (*tutors*) and *monitors* who were responsible for designing, teaching, and providing feedback to students throughout the entire course, as (P#1) offers *"Congratulations to both the Moodle material development team and the teachers and monitors. It was a very good course with many learnings*!."

In the same perspective, some students also highlighted how the teaching material designed offered in terms of content related to the student's life and how it was delivered to them as (P#2) points out that *"I was very satisfied with everything that the course offered, I was even impressed by the way the subject was taught, simply and lightly…"* These points of view express how the material and gamification strategies call the student's attention, as emphasized in the ARCS Model (Keller, 2016, 2017) "attracting and sustaining the student's attention is often a requisite to learning." In addition, P#3's opinions affirm that *"the course was cool and fun. The activities, as the course progressed, were closer to the context of the students (and mine mainly), which is why I always liked them. The games and interaction helped me a lot. The teachers and tutors were always kind and attentive. Congratulations on every aspect < 3.*"

Regarding the organization and visual layout of the material on the Moodle platform, 72% of students highlight that it was well-organized. Nevertheless, there is still room for improvement due to the limitations implied by the platform. We believe that modules and plugins could be used to further enhance gamification strategies, as well as potentialize the students' response to the platform's interactivity.

The students were asked about how gamified challenges provided significant practices to their learning experience and how the reviewing content challenges provided scaffolding to their language learning knowledge. As a result, for more than 80% of participants, the challenges provided opportunities for effective and practical language learning contexts. As suggested by Keller (2016), "ensuring content is a way to show how relevant it should be to their learning processes." To do it, the role of the tutors and teachers in online interaction is to emphasize how relevant the proposed activities are, mainly by establishing "links to prior knowledge, showing the present worth of the task, showing the future usefulness of the task, and modeling usefulness" (Keller, 2016).

Furthermore, it can be identified that gamification strategies such as challenges and content review were meaningful in the course. The results fortify that most students (81% of them) were more likely to engage in the proposed activities in class due to the scoring system adopted to generate course points motivating them to do all the activities and participate in the classes.

4. Practical implications, objectives, and lessons learned

In this article, we illustrated some experimental results obtained during the application of the course E-3D and how the

course makes it possible to implement gamification in the design of digital teaching materials considering the theoretical support and the Brazilian context in which the online course is offered. The E-3D course makes it possible to students in social vulnerability to have the opportunity to have free classes in real time with well-prepared tutors and with well-designed material, including innovative methodologies in the language learning processes. From the results, it is possible to infer that the participants evaluate the course positively since they say it is "*a differentiated and dynamic virtual learning environment. All of this is free of charge since an English course in Brazil has a high cost*." In addition, the students´ opinions convey that "*The semester was great! The girls do very well, and all the dynamics were super easy to do. Great course, I recommend it to everyone*." It highlights the confidence the students had in the methodology and in the material as well as the satisfaction of being able to complete the course.

In this sense, and considering the data collected, we believe that the use of gamification strategies and the rich design implemented in the course contribute to this positive evaluation, even though we know that the course still demands a redesign to provide language practice by exploring more narrative elements that can conduct the student throughout the different challenges inside the branching scenarios. In this way, we can provide activities that get the participants to solve problem situations as much as getting them engaged in the different scenarios and challenges to practice, use, and learn the target language.

To do it, it seems necessary to implement a new narrative, and challenges that allow the learners to fight with the different bosses that will be presented inside the content as long the narrative develops. The idea is to work with RPG strategies to keep the students learning by doing, with autonomy, and at a distance. On the other hand, it seems necessary to develop more empirical studies and implement extra narrative strategies into the content proposed in the E-3D course as an alternative to getting the students to explore meaningful gamification strategies inside the Moodle platform.

The results from this study provide evidence that the guidelines to support further use of gamification design in an online course should include a learning path that presents: (a) a placement test to evaluate the student's linguistic level based on CEFR; (b) a diagnostic test to apply to the target audience to identify the learner previous experiences with online learning and with the use of game-based learning or gamification strategies; (c) a gamification protocol to support the design of the online course interaction considering the target audience and the framework or model of course that will apply; (d) a digital material that plan and include into its design narrative choices, the use of points, badges, and titles considering the learner's experiences and interaction with the proposed mission and challenges. These are singular guidelines and suggestions based on our previous experiences that require further studies and evaluation, so it is why we recommend that other future studies could reapply the suggested gamification protocol in other similar academic contexts.

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 University of Santa Maria by Code CAAE: 55559422.7.0000.5346 – Comitê de Ética em Pesquisa com Seres Humanos – CEP. The patients/participants provided their written informed consent to participate in this study.

Author contributions

SR contributed to conception and design of the study. DP and MF organized the images and graphics, select the datas to illustrate the data analysis. MF and AL wrote the first draft of the manuscript. SR wrote the methodology section and data analysis of the manuscript and review all the manuscript and data analysis. All authors contributed to manuscript revision, read, 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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