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Comparing the effect of lecture method and cooperative teaching method on the learning, communication skills, and attitudes of students: a quasi-experimental study

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Introduction: Students can enhance their understanding of contemporary scientific developments by acquiring proficiency in the English language. Teaching approaches play a crucial role in language acquisition. The objective of this study was to evaluate the effectiveness of the lecture method in comparison to the cooperative learning method, specifically focusing on students' learning outcomes, communication skills, and attitudes.

Methods: This quasi-experimental interventional study was conducted at Sirjan School of Medical Sciences, Sirjan, Iran in 2023 involving a sample of 30 third-semester students. Participants were randomly assigned to one of two groups, namely the lecture-based teaching group and the cooperative teaching group, with each group consisting of 15 members. Before and after the intervention, questionnaires were completed to assess learning, communication skills, and attitude in both groups. Data were analyzed by independent t-test to compare the two groups. Also, the Levene's test was used to check the assumption of the equality of variances. Besides, the paired t-test was applied to compare results within each group. The chi-square test was utilized to compare the qualitative variables, while analysis of covariance (ANCOVA) test with adjusting the base value of dependent variables was used to compare the mean differences between the two groups after the intervention.

Results: Findings showed a statistically significant improvement in the mean learning score of the cooperative group after the intervention, compared to the score prior to the intervention ($p = 0.007$). Moreover, the communication skills and attitude scores of students in both the cooperative and lecture groups showed a statistically significant increase after the intervention, as compared to their pre-intervention scores ($p < 0.05$). Additionally, following the intervention, the mean scores for communication skills and attitudes were significantly higher in the cooperative group compared to the lecture group, with statistical significance indicated by $p < 0.001$ and $p = 0.03$, respectively.

Conclusion: This study highlights the effectiveness of cooperative teaching over traditional lecture methods in enhancing students' learning outcomes, communication skills, and attitudes. The findings indicate that cooperative

learning fosters greater engagement, collaboration, and significant interaction among students, ultimately leading to improved academic performance and student satisfaction within the educational framework examined.

KEYWORDS

medical education, lecture, cooperative learning, communication skills, learning outcomes

Introduction

The acquisition of a language distinct from one's native tongue has long been a topic of scholarly interest among individuals. The increasing interdependence among nations, coupled with the crucial role of language in promoting this connectivity, has markedly heightened the importance of mastering the English language (Akbari Borang et al., 2014). University students are required to fulfill a series of English language courses that are specifically designed to align with their respective fields of study and the requirements of their academic programs.

To the best of our knowledge, a majority of university students with limited English language proficiency are mandated to successfully complete courses in General English. Hence, given that the majority of academic learning experiences for students occur within the university setting, it is essential to incorporate active learning strategies and enhance student motivation (Nazarieh et al., 2023). However, research indicates that the rate of dropouts and academic failure is dependent on the educational systems, which have not successfully created an environment conducive to the development and success of students. Furthermore, the current pedagogical approaches seem to demonstrate a lack of effectiveness in sufficiently equipping students for their future careers (Han, 2022). One potential strategy to address this issue involves the adoption of active teaching methods that promote effective learning outcomes and improve students' competencies in formal interactions within an educational context (Azizifar and Hosseinpour, 2020).

The lecture method is a frequently employed pedagogical approach in higher education for instructing students. It is cost effective and suitable for teaching a substantial amount of course material, making it particularly advantageous for instruction in large, crowded classrooms. While this pedagogical approach offers several advantages, its application without the active engagement of students may foster a passive learning environment, ultimately resulting in a superficial understanding rather than deep learning (Beigzadeh and Haghani, 2016). Research indicates that in lecture-based teaching method, around 80% of the material is generally forgotten within an eight-week period. In contrast, learner-centered approaches promote active learning, student satisfaction, and strengthen critical thinking skills (Safari et al., 2006).

In Medical Universities in Iran, the prevailing pedagogical approach for delivering English language courses predominantly utilizes lectures. However, it is essential to engage students actively in the teaching-learning process by incorporating interactive teaching methodologies. It is imperative for university students to attain an adequate level of language proficiency to effectively translate specialized texts pertinent to their discipline and to advance their education at more advanced academic tiers. Consequently, the use of active teaching methods is crucial for university students. The research

conducted by Akbari Borang et al. demonstrates that the teaching method, student attitudes, and learning strategies play a significant role in the academic progress of students studying English (Akbari Borang et al., 2014).

The cooperative teaching method is a learner-centered pedagogical approach that improves the quality of learning by actively involving students in the learning process. Cooperative teaching facilitates active student participation in classroom discussions, promotes the articulation of individual thoughts and personal experiences, and contributes to the development of critical thinking skills. This pedagogical approach not only encourages collaboration among peers but also enhances students' self-confidence and improves their communication skills (Alamoudi et al., 2021).

Communication skills encompass a set of competencies that facilitate effective interpersonal interactions, thereby promoting the development of emotional relationship. Developing communication skills help individuals enhance and maintain interpersonal relationships within society (Moghadami et al., 2016). This is of high importance for university students, especially those in the field of Medical Sciences, who engage with patients, their families, and healthcare professionals. Research suggests that the effective use of communication skills across diverse contexts facilitates individuals to make informed decisions and engage in appropriate behaviors (Leonard et al., 2004). The study carried out by Rahimi et al. illustrates that the cooperative teaching method has a significant impact on the communication skills of students (Rahimi et al., 2022).

Social interdependence theory forms the theoretical framework of this study. The fundamental principle of social interdependence theory posits that an individual's attainment of their goals is influenced by the actions of others. This signifies that the interaction among individuals enhances the effectiveness of cooperative learning, as the contributions of others are integral to the learning process (Yassin et al., 2018). In order to facilitate cooperative learning, five fundamental principles derived from social interdependence theory are essential. These principles include: (1) positive interdependence fostered by the establishment of collective objectives, collaborative tasks, designated team roles, educational goals, incentives, or the allocation of shared resources, (2) face-to-face interaction among students and their peers, (3) individual accountability fostering personal responsibility by means of individual examinations or self-assessment and peer assessment methodologies, (4) interpersonal and small group skills, and (5) group processing involving the collective reflection of group members on the skills and processes utilized within the group, leading to informed decisions regarding which practices to maintain and which to modify (Johnson and Johnson, 2009).

The salient characteristics of cooperative learning foster student engagement by offering opportunities for dialog problem-solving, consensus formation, team development, power distribution, and trust establishment (Mills, 2003). These elements contribute to

heightened enthusiasm and a sense of mutuality among participants. The collaborative skills that students cultivate through cooperative learning activities are applicable to problem-based learning, self-directed learning, and experiential learning (Halpern, 2003; Rees, 2004).

Comprehensive research findings suggest that cooperative learning enhances academic performance and contributes to improved psychological well-being among students across all educational levels, while also fostering positive interpersonal relationships, a fundamental component of effective teamwork (Smith et al., 2005). The study conducted by Momeni Danaei showed that students instructed through the cooperative teaching method showed higher levels of learning and satisfaction compared to their counterparts who received instruction via the traditional lecture method (Momeni Danaei et al., 2011). Similarly, the study undertaken by Mohammadjani et al. demonstrated that students achieved significantly higher scores in learning the educational material when instructed through the cooperative teaching method, as opposed to the lecture-based teaching (Mohammadjani and Tonkaboni, 2015).

Considering the importance of the English language course in students' academic career and the imperative to improve their language skills for future academic pursuits, alongside the transition from traditional pedagogical approaches to learner-centered approaches, as well as the paucity of research in our specific context, this study sought to examine the effects of lecture-based and cooperative teaching methods on students' learning outcomes, communication skills, and attitudes at Sirjan School of Medical Sciences.

Methods

Study design and subjects

This quasi-experimental study with a pretest-posttest design was conducted on 30 s-year students in the Medical Laboratory Sciences program at Sirjan School of Medical Sciences, Sirjan, Iran. Participants were selected through census sampling method and were enrolled in the General English course during the first semester of the 2023–2024 academic year. In order to adhere to ethical guidelines, participation in the study was voluntary, and informed written consent was obtained from all participants. Prior to the initiation of the research, a session was held to elucidate the objectives of the study and the teaching process in both methods to the students. We also addressed any inquiries accordingly.

Inclusion and exclusion criteria

The inclusion criteria were: (1) third-semester students studying Medical Laboratory Sciences who were enrolled in the General English course; (2) completion of both the pretest and posttest; and (3) willingness to take part in the research. The exclusion criteria included: (1) students retaking the General English course; (2) missing more than 3 classroom sessions; and (3) not completing both the pretest and posttest.

Study approach

Given that variations in students' prior knowledge, particularly in language proficiency, can adversely influence the interpretation of learning outcomes, we sought to mitigate this concern by implementing an initial interview and placement assessment to evaluate baseline language proficiency. Then, students were divided into two groups of 15 using a random number table, with one group as the control group and the other as the experimental group. In the first group, teaching was delivered via lectures complemented by interactive question-and-answer as well as practical exercises. In contrast, the subsequent group focused on cooperative teaching method. The teaching sessions included educational content from specific readings within the textbooks "Active Skills for Reading" (Anderson, 2013) and "Inside Reading" (Rubin, 2009). In a similar vein, both groups were instructed within comparable settings, and the researchers endeavored to gather demographic information to ascertain any notable differences that could be associated with learning outcomes. As illustrated in Table 1, there were no significant differences observed between the two groups at the onset of the study.

The intervention was implemented throughout the first semester of the 2023–2024 academic year, encompassing a total of 14 sessions over the entire semester. This extensive duration enabled a comprehensive application of both lecture-based and cooperative teaching approaches, thereby allowing for a detailed examination of their impacts on students' language proficiency and communication skills. Throughout the semester, students attended regular class sessions, each meticulously designed to build upon prior lessons and reinforce established learning objectives. By encompassing a full semester, the intervention provided students with significant opportunities to engage with the course content, practice their skills, and reflect on their learning experiences within a structured educational framework.

Teaching models

In regards to teaching methods, in the following section, a detailed explanation of both teaching methods is provided. It is important to mention that the lecture method is commonly used in classroom instruction, and it is a predominant typical teaching method used at our context.

Lecture teaching method

The lecture teaching method has a structured approach to deliver the educational content, primarily characterized by the instructor's direct presentation of material to students.

Pre-teaching activities: Before teaching, the instructor reviews previous course materials to reinforce students' knowledge and prepare them for new content. Following this, a five-minute session allows students to ask questions, clarifying doubts and actively engaging with the material, which fosters a supportive learning environment.

Teaching session: The core teaching segment lasts 35 min, during which the instructor presents organized educational content, often using visual aids to enhance understanding. Following this, a 10-min

TABLE 1 Demographic characteristics of participants in the lecture-based and cooperative groups.

Variables	Lecture group (n = 15)	Cooperative group (n = 15)	*p-value
Gender n(%)			0.70 ^a
Female	9(60)	10(66.7)	
Male	6(40)	5(33.3)	
Age (year)	20.86 ± 3.02	20.46 ± 1.64	0.65
Marital status (n) (%)			0.30 ^a
Single	15(100)	14(93.3)	
Married	0(0)	1(6.7)	
Residence (n) (%)			0.62 ^a
Native	2(13.3)	3(20)	
Non-native	13(86.7)	12(80)	
Previous English grade	16.40 ± 2.27	16.61 ± 1.85	0.77
GPA	16.24 ± 2.07	16.45 ± 1.75	0.76
English interest (n) (%)			0.43 ^a
Low	0(0)	0(0)	
Medium	6(40)	4(26.7)	
High	9(60)	11(73.3)	
Career development			0.62 ^a
Yes	12(80)	13(86.7)	
No	3(20)	2(13.3)	
English courses (n) (%)			0.54 ^a
Yes	1(6.7)	2(13.3)	
No	14(93.3)	13(86.7)	

The values presented in the table are reported as mean ± standard deviation. $p < 0.05$ is considered as statistically significant. * $p < 0.05$ was considered as significant using Independent t-test between the two groups at baseline.

^a $p < 0.05$ was considered as significant using Chi-square test.

question-and-answer session allows students to seek clarification on the material. This interactive exchange encourages critical thinking and helps solidify students' comprehension of the subject matter.

Break and individual exercises: Following a five-minute break, students participate in 20 min of individual exercises focused on comprehension and vocabulary, aimed at reinforcing the concepts presented in the lecture and evaluating their understanding. Subsequently, the instructor dedicates 10 min to reviewing the answers, providing immediate feedback and clarification on any misconceptions, thereby facilitating a deeper understanding of the material among the students.

Summary and homework: In conclusion, the lecture is summarized in a five-minute overview that emphasizes the principal topics covered, thereby enhancing student comprehension and retention. Following the class, students are given homework assignments designed to facilitate the application of their knowledge

and encourage independent exploration of the subject matter, which is essential for solidifying concepts and fostering ongoing learning.

Cooperative teaching method intervention

The cooperative teaching method was designed to actively engage students in the learning process, promoting collaboration and communication. The intervention consisted of the following structured components:

Preparation of materials: Prior to each class, students were provided with educational materials, including vocabulary lists and reading texts relevant to the course content. This preparation encouraged students to familiarize themselves with the material before class discussions.

Group formation: Students were divided into five groups of three members each. This small group size was chosen to facilitate meaningful interaction and ensure that each student could contribute to discussions. Each group selected a representative responsible for summarizing group findings and sharing insights with the class.

Inquiry and clarification session: Each class session began with a 10-min period where the instructor addressed any questions or concerns from students regarding the reading materials. This ensured that all students had a clear understanding of the content and could engage meaningfully in subsequent activities.

Narrative summary activity: After the inquiry session, students were tasked with compiling a concise narrative summary of the assigned reading material. This activity lasted 15 min and aimed to reinforce comprehension and encourage students to articulate their understanding of the text.

Group reading and vocabulary discussion: Following a brief 5-min break, students engaged in a 25-min collaborative reading session within their groups. During this time, they read the assigned text together, discussed unfamiliar vocabulary, and exchanged ideas about the content. This peer interaction was critical for enhancing understanding and developing communication skills.

Role exchange and collaboration: After the group reading, the representatives from each group exchanged positions with representatives from other groups. This 10-min activity allowed students to collaborate with peers from different groups, share their insights, and discuss their learning experiences. This exchange fostered a broader perspective on the material and encouraged students to articulate their thoughts in a new context.

Group sharing: Students returned to their original groups for another 10 min to share the insights gained from the role exchange. This step reinforced collaborative learning and provided an opportunity for students to reflect on their learning process collectively.

Collaborative exercises: The final 15 min of the class involved group exercises focused on reading comprehension and vocabulary application. Students worked together to complete these exercises, which were designed to reinforce the material learned during the session. The instructor acted as a facilitator, providing guidance and support as needed.

Closure and homework assignment: The instructor concluded the session with a 5-min summary of the key points covered during the class, reinforcing the learning objectives. Students were then assigned homework to review the course material and complete additional exercises outside of class, ensuring continuous engagement with the

content (Karimi Moonaghi et al., 2014). The steps are shown in Figure 1.

Potential confounding factors

The instructor effect can have a substantial impact on the study's outcomes. To mitigate variability in teaching style and delivery, both instructional methods were administered by the same instructor. This strategy allowed for a more accurate attribution of any differences in student outcomes to the teaching methods employed, rather than to the individual teaching style of the instructor. Furthermore, the first author of this manuscript, who conceptualized and executed the intervention, holds a Ph.D. in Medical Education and possesses expertise in the field, thereby ensuring uniformity in the implementation of both teaching approaches.

Data collection

In order to assess the effectiveness of the two teaching approaches, a pretest and posttest containing 25 multiple-choice questions (15 vocabulary and 10 reading comprehension questions) were administered to students in the electronic testing center. The test was

designed with a total score of 20 points, where each question had one correct answer. The scoring range extended from a minimum of 0 to a maximum of 20 points. The validity of the test was obtained by four English language experts, and necessary changes were made based on their opinions. Reliability was determined by using Cronbach's alpha, which yielded a value of 0.87, signifying that the test is reliable.

To assess communication skills, we used the standardized Queendom Communication Skills inventory both prior to and following instruction with both teaching methods. This inventory consists of 34 questions organized into 5 categories. Students' answers are recorded on a 5-point Likert scale ranging from 1 (Never) to 5 (Always). The minimum and maximum scores of this inventory are 34 and 170, respectively. In the present study, we established the suitability of the Queendom Communication Skills inventory for our target population by conducting a pilot test prior to the main data collection phase. This preliminary investigation enabled us to evaluate the relevance and clarity of each item within the context of our participants, thereby reinforcing the inventory's applicability and validity for our sample. This approach is consistent with the findings of Rahimi et al., who examined the comparative effects of cooperative learning and lecture-based training on motivational beliefs and self-regulated learning strategies. In their research, the reliability of the questionnaire was determined to be 0.85 using Cronbach's alpha method (Rahimi et al., 2022).

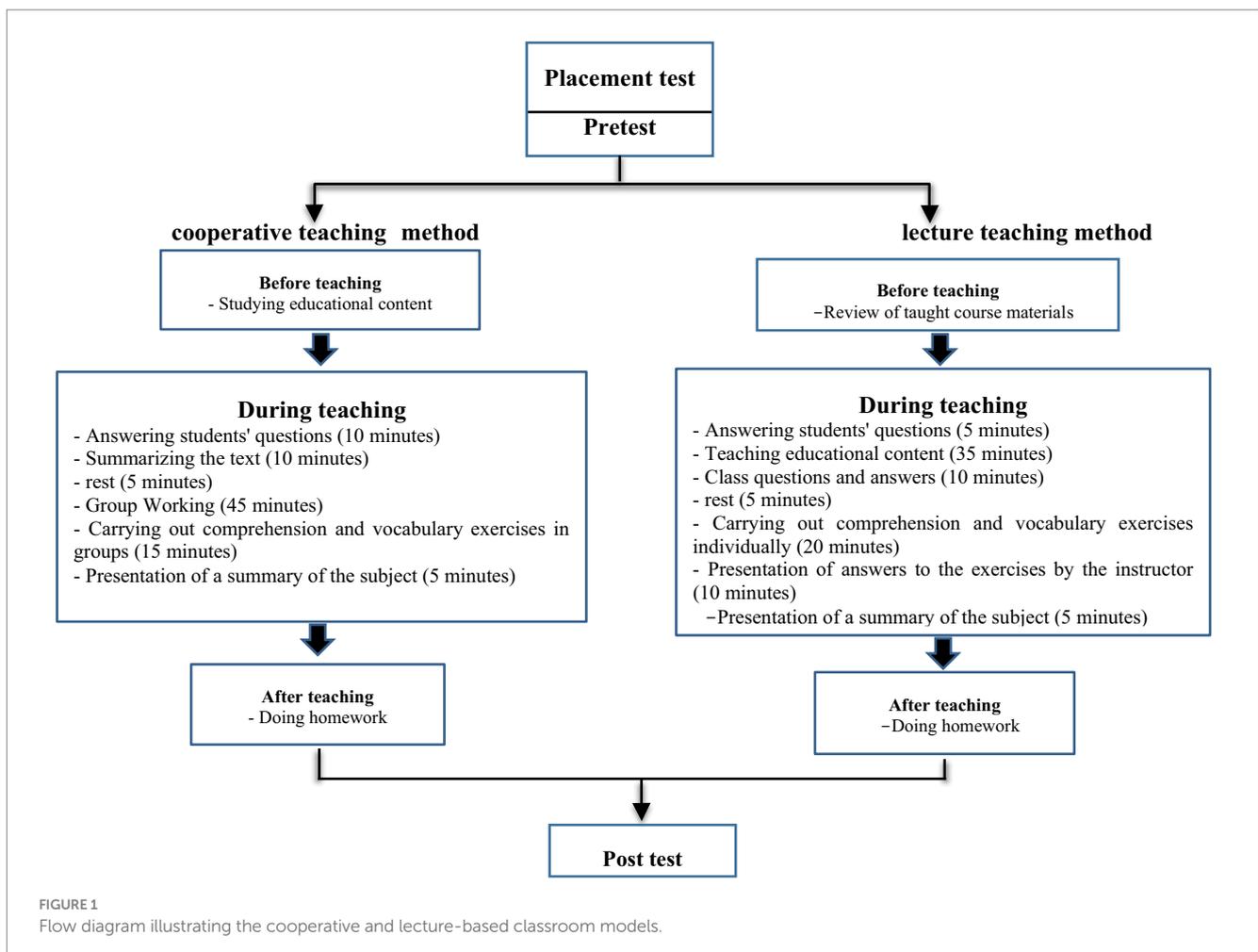


FIGURE 1 Flow diagram illustrating the cooperative and lecture-based classroom models.

Similarly, our reliability analysis of the Queendom Communication Skills inventory with our specific student sample yielded a value of 0.81, thereby confirming that the inventory exhibited a high level of reliability.

To obtain the opinions of students regarding the two teaching approaches, we used the questionnaire developed by Vasili and Farajollahi (2015). This questionnaire comprises 10 items and participants express their opinion on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The minimum and maximum scores of this questionnaire are 10 and 50, respectively. A score of 35 to 50 indicates effectiveness, while a score of 20 to 35 signifies neutrality, and a score of 10 to 20 suggests ineffectiveness. This survey has been confirmed to be reliable with a reliability coefficient of 0.87 (Vasili and Farajollahi, 2015).

Sample size

According to the study conducted by Kolahdouzan et al. (2020) and considering learning as the main outcome, the sample size was calculated (95% confidence interval and 80% power) according to the

relevant formula $(n = \frac{\left(z_1 - \frac{\alpha}{2} + z_1 - \beta\right)^2 (\delta_1^2 + \delta_2^2)}{(\mu_1 - \mu_2)^2})$. A sample size

of 15 individuals was obtained for each group.

Statistical analysis

The Kolmogorov–Smirnov test was used to determine the normality of the variables. The independent t-test was used to compare quantitative data with normal distribution between the lecture and cooperative groups before and after the intervention. Also, the Levene's test was used to check the assumption of the equality of variances, and a p -value greater than 0.05 indicated that the variances are equal. Besides, the paired t-test was applied to compare results within each group before and after the intervention. The chi-square test was utilized to compare the qualitative variables, while analysis of covariance (ANCOVA) test with adjusting the base value of dependent variables (learning, attitude, and communication skills) was used to compare the mean differences between the two groups after the intervention. It is essential to mention that the Levene's test was used to check the assumption of the homogeneity of variances, and a p -value greater than 0.05 indicated that the variances are equal. The partial Eta Squared value indicated the effect size for the ANCOVA test (0.2 – small effect, 0.5 – moderate effect, 0.8 – large effect). Data were analyzed by using SPSS software version 23 (Chicago, IL, United States). This study was approved by the Ethics Committee of Sirjan School of Medical Sciences under the ethics code IR.SIRUMS.REC.1402.031.

Results

Out of the 30 students in this study, 60% of the lecture group were female ($n = 9$) and 40% were male ($n = 6$), while 66.7% of the cooperative group were female ($n = 10$) and 33.3% were male ($n = 5$).

The mean age of participants in the lecture and cooperative groups was 20.86 ± 3.02 and 20.46 ± 1.64 , respectively. There were no statistically significant differences between the two groups in terms of gender, age, marital status, residence, previous English course grade, Grade Point Average (GPA), etc. (Table 1).

Regarding the learning outcome, results of within group test indicated a significant increase in the mean of learning score in the cooperative group following the intervention, as compared to that before the intervention (11.84 ± 2.63 vs. 10.18 ± 2.25 , $p < 0.007$). In the lecture group, the learning score increased after the intervention compared to that before the intervention (11.73 ± 3.18 vs. 10.56 ± 2.03), but this difference was not statistically significant ($p = 0.21$). Results of the between-group test showed that following the intervention, there was no significant difference between the mean of learning score between the cooperative group and the lecture group (11.84 ± 2.63 vs. 11.73 ± 3.18 , $p = 0.92$). Additionally, findings revealed that there was no significant difference in the mean changes in learning scores between the cooperative and lecture groups after adjusting for baseline variable scores (9.20 ± 8.48 vs. 6.00 ± 6.02 , $p > 0.05$).

Concerning the communication skills, results of within group test showed a significant increase in the mean of communication skills score in the cooperative group following the intervention, as compared to that before the intervention (116.53 ± 4.38 vs. 80.26 ± 4.55 , $p < 0.001$). In the lecture group, the communication skills score increased after the intervention compared to that before the intervention (105.46 ± 5.91 vs. 82.80 ± 3.91 , $p < 0.001$). Results of the between-group test showed that following the intervention, the mean of communication skills score in the cooperative group was significantly higher than the lecture group (116.53 ± 4.38 vs. 105.46 ± 5.91 , $p < 0.001$). Furthermore, it was found that the mean changes in the communication skills score before and after adjusting the baseline variable score in the cooperative group was significantly higher than the lecture group (36.26 ± 5.82 vs. 22.66 ± 6.73 , $p < 0.001$).

In terms of the attitude, results of within group test showed a significant increase in the mean of attitude score in the cooperative group following the intervention, as compared to that before the intervention (38.13 ± 5.30 vs. 28.93 ± 7.75 , $p < 0.001$). In the lecture group, the attitude score increased after the intervention compared to that before the intervention (32.80 ± 7.93 vs. 26.80 ± 4.21 , $p < 0.002$). Results of the between-group test showed that following the intervention, the mean of attitude score in the cooperative group was significantly higher than the lecture group (38.13 ± 5.30 vs. 32.80 ± 7.93 , $p < 0.03$). Furthermore, it was found that the mean changes in the attitude score before and after adjusting the baseline variable score in the cooperative and lecture groups were not significantly different (1.65 ± 2.03 vs. 1.17 ± 3.51 , $p > 0.05$; Table 2).

Discussion

This study was carried out at Sirjan School of Medical Sciences for the inaugural time to evaluate the effectiveness of lecture-based teaching versus cooperative teaching method on students' learning outcomes, communication skills, and attitudes in an English language course. Evidence shows that traditional teaching approaches may

TABLE 2 Learning, attitude, and communication skills variables before and after the intervention.

Variables	Lecture group (n = 15)	Cooperative group (n = 15)	p-value **	p-value***	p-value****	Effect size
Learning						
Before	10.56 ± 2.03	10.18 ± 2.25	0.63			0.003 ^a
After	11.73 ± 3.18	11.84 ± 2.63	0.92			
p-value*	0.21	0.007				
Difference	1.17 ± 3.51	1.65 ± 2.03		0.65	0.76	
Attitude						
Before	26.8 ± 4.21	28.93 ± 7.75	0.35			0.11
After	32.8 ± 7.93	38.13 ± 5.3	0.03			
p-value*	0.002	0.001				
Difference	6.00 ± 6.023	9.20 ± 8.48		0.24	0.06	
Communication skills						
Before	82.8 ± 3.91	80.26 ± 4.55	0.11			0.54
After	105.46 ± 5.91	116.53 ± 4.38	< 0.001			
p-value*	< 0.001	< 0.001				
Difference	22.66 ± 6.73	36.26 ± 5.82		< 0.001	< 0.001	

The values presented in the table are reported as mean ± standard deviation. $p < 0.05$ was considered as significant using Paired t-test. ** $p < 0.05$ was considered as significant using independent t-test between the two groups at baseline and post-intervention. *** $p < 0.05$ was considered as significant difference using independent t-test between the two groups post-intervention. **** $p < 0.05$ was considered as significant using Analysis of covariance (ANCOVA) between the two groups post-intervention after adjusting the baseline value of each dependent variable. ^aEffect size is defined for the ANCOVA test.

impede students' development of essential English language skills including listening, speaking, reading, and writing (Behrouzi et al., 2014; Ayati and Sarani, 2012). In relation to our research, similar studies have been conducted in Iran and other countries exploring different teaching approaches and their impact on student learning in English language courses (Garshasbi et al., 2017; Gömleksiz, 2007).

It is essential to broaden the applicability of our findings to non-Western contexts, where cultural values and educational practices may vary considerably. In numerous non-Western societies, such as Iran, education is frequently perceived as a collective undertaking that prioritizes collaboration, respect for authority, and student engagement. These cultural characteristics are congruent with the principles of cooperative learning, which promotes collaboration and mutual support among students. Empirical evidence suggests that cooperative learning can significantly improve student engagement and academic performance in non-Western educational contexts. For example, research conducted in Asian nations, including China, has demonstrated that the implementation of cooperative learning strategies fosters a sense of belonging and community among students. This phenomenon is particularly important in cultures that emphasize collective harmony rather than individual success (Morgan and Wu, 2011). Furthermore, within the context of educational environments in the Middle East, cooperative learning has been identified as an effective means of enhancing communication skills and promoting critical thinking. A study conducted in Saudi Arabia revealed that students participating in cooperative learning activities showed more substantial advancements in their English language proficiency and collaborative abilities than their counterparts in conventional lecture-based settings (Alghamdi and Gillies, 2013). This aligns with our research, which indicates that cooperative teaching markedly enhanced communication skills among students.

Leaning outcome

Our findings regarding students' leaning outcome revealed that there was an increase in students' learning in both groups following the intervention. However, the difference was found to be statistically significant only in the group that was instructed using the cooperative method. The statistically significant improvement in learning outcomes observed within the cooperative group can be ascribed to the interactive, supportive, and adaptive characteristics of cooperative learning. This approach effectively engages students in the educational process and promotes a deeper comprehension of the subject matter. It is important to recognize that the types of assessments employed to evaluate learning outcomes can have a substantial effect on the results obtained. Within the cooperative group, the collaborative efforts of students in engaging with assessment activities through teamwork and peer communication led to enhanced learning outcomes.

The study conducted by Namaziandost indicates an improvement in students' speaking skills, motivation and attitudes in an English language course using the cooperative teaching method (Namaziandost et al., 2019). In a similar line, the study undertaken by Alharbi et al. emphasized the enhancement of students' learning outcomes and the positive attitudes through the implementation of cooperative teaching method aimed at improving the English-speaking skills of Saudi Arabian students (Alharbi, 2015). Results of various studies in the field of English language align with our findings (Nasri and Biria, 2017; Er and AtaÇ, 2014). For instance, Liao investigated the effects of cooperative learning on motivation, learning strategies, and grammar proficiency in English as a foreign language students in Taiwan. Using a quasi-experimental design over 3 months, the study involved 42 students from two college classes. Data were collected through pre- and post-test scores. The findings showed that

cooperative learning significantly improved both motivation and grammar achievement among participants (Liao, 2006). To note, the observed non-significant increase in learning scores among the lecture group can be ascribed to several factors, including the passive nature of the instructional method, which prioritizes content delivery over critical engagement. Additionally, the varied learning styles of students and potential external motivational influences may also play a role. Collectively, these factors highlight the constraints of traditional lecture formats in promoting significant and meaningful learning outcomes, especially in contrast to more interactive and collaborative pedagogical approaches.

Studies conducted in the field of Medical Sciences show the positive effect of cooperative teaching (Momeni Danaei et al., 2011; Ibrahim et al., 2022). Anderson et al. compared student performance in biochemistry course using cooperative teaching versus traditional lecture-based teaching. Findings revealed better scores on students' learning outcome as well as problem solving skills when taught by cooperative teaching method (Anderson et al., 2005). Evidence indicates that there has been a significant shift in English language teaching pedagogy from teacher-centered to learner-centered models. This emphasizes the importance of student participation in the learning process as a key factor in developing critical thinking skills (Bahmanbijar et al., 2019). This shift has provided many learning opportunities for students to develop essential language skills. As a result, the cooperative teaching approach is regarded as a suitable and effective teaching method for English language instruction (Hernández and Boero, 2018; Alijani Tori et al., 2021). In the cooperative teaching method, students have the opportunity to share their ideas and experiences with their peers by actively participating in class discussions. Mackey believes that social interactions in the classroom are necessary for learning English, and students who participate in the teaching process achieve better learning outcomes (Mackey and Philp, 1998). The cooperative teaching method grounded in the principles of social interdependence theory, emphasizes the importance of positive interdependence, individual accountability, and collaborative skills (Johnson and Johnson, 2009). By structuring the class around group activities and discussions, the intervention aimed to create an environment where students relied on one another to achieve common learning goals. The use of specific activities—such as the narrative summaries, group discussions, and collaborative exercises—demonstrated the application of cooperative learning principles. For instance, the requirement for students to prepare in advance and contribute to group discussions ensured that each member was accountable for their learning, while the diverse interactions fostered a sense of community and mutual support.

It is essential to note that the principal emphasis of our learning outcome assessments was on vocabulary and reading comprehension, which are fundamental elements of language proficiency. Nevertheless, we acknowledge that these assessments may not adequately encompass higher-order cognitive skills, including critical analysis, synthesis, and the application of knowledge in practical contexts. Consequently, future research endeavors could benefit from integrating a wider array of evaluative instruments, such as performance-based tasks, project assignments, or reflective essays, which necessitate students to utilize their knowledge and exhibit critical thinking abilities. This approach would yield a more holistic understanding of student learning that extends beyond mere vocabulary and reading comprehension.

Communication skills

With regard to communication skills, our findings explain that cooperative teaching is a more successful approach compared to lecture-based teaching in developing communication skills. This finding is corroborated by previous studies conducted by Liaghatdar et al. (2023) and AbuSeileek (2012). Rahimi et al. conducted a quasi-experimental study using a pretest-posttest design to compare the effect of cooperative teaching vs. traditional lecture-based teaching on the communication skills of first-year medical students at Shiraz University of Medical Sciences. Findings indicated that the cooperative approach led to significant improvements in students' communication skills (Rahimi et al., 2022). Ning's study demonstrated that English language students showed a considerable improvement in their social skills when taught by cooperative teaching method in comparison to traditional lecture-based method (Ning, 2013). The observation that cooperative teaching is more effective in enhancing communication skills can be ascribed to several factors inherent in cooperative learning. These include its interactive characteristics, the focus on teamwork and engagement, the integration of specific communication activities, and the prompt feedback offered by peers. These components create an environment conducive to active practice and refinement of communication skills, resulting in more substantial advancements than those typically observed in the passive learning context associated with traditional lecture-based instruction. Conversely, in traditional lecture-based classroom settings, students are typically passive observers and only the recipients of knowledge and they have limited opportunities for interaction. One notable aspect of our results is the increase of post score obtained for communication skills in the lecture group. This finding requires further research as it contradicts expectations based on the limited interaction typically associated with traditional teaching method.

Attitude

In terms of students' opinions, findings showed that students favored cooperative method more than the lecture method. This finding is consistent with studies conducted by Derwing and Munro (2013) and Namaziandost et al. (2019). It seems that the increase in satisfaction score in both groups is owing to the positive students' view and their willingness in the use of these two methods in teaching. Given that due to the extensive use of traditional teaching methods by teachers in classroom settings, students have a preference for lecture teaching. Moreover, as in our study, the lecture approach was delivered in an organized format with concise steps, we can assume that this led to increased satisfaction among students. Our literature review indicates that there is more positive attitude toward the use of cooperative teaching in classroom settings (Namaziandost et al., 2019; Soleimani and Khosravi, 2018). It is important to acknowledge the significance of cooperative teaching in which students are more likely to actively engage, fostering a social atmosphere that enhances motivation and positive attitudes toward learning.

Implications

The implications of this study are manifold. First, the medical sciences universities in Iran ought to reevaluate their pedagogical

approaches, especially in the realm of English language education. The transition from conventional, teacher-centered approaches to cooperative learning environments not only improves academic outcomes but also fosters critical soft skills, including communication and teamwork. These competencies are becoming increasingly important in the contemporary job market, where proficiency in English frequently correlates with professional opportunities and career progression. Second, the notable enhancement of communication skills observed within the cooperative group suggests that this pedagogical approach may be especially advantageous for students facing challenges in language acquisition. By promoting peer interactions and discussions, cooperative teaching fosters a supportive environment in which students can engage in the practice and refinement of their language abilities in real-time, thereby alleviating the anxiety often linked to language use. This characteristic is particularly pertinent in settings where students may experience intimidation due to conventional classroom dynamics. The last but not least, the results of our study bear significant implications for curriculum development. It is recommended that educators incorporate cooperative learning strategies into their course syllabi, thereby facilitating activities that encourage collaboration and peer-to-peer learning. Such integration may be realized through the implementation of organized group projects, peer assessments, and collaborative problem-solving exercises. These approaches not only improve language proficiency but also cultivate critical thinking and interpersonal skills among students.

Limitations

The major limitation of our study is the small sample size. Our research was carried out with a sample size of merely 30 participants, which constrains the generalizability of the results. An increased sample size would yield more substantial data and facilitate a more comprehensive understanding of the impact of the teaching methods across a broader and more diverse population. In this regard, results should be interpreted with caution. Also, the implementation of census sampling has the potential to introduce selection bias, as it entails the inclusion of all eligible participants from a designated group. This approach may not provide an accurate representation of the wider population of medical sciences students, thereby constraining the generalizability of the findings to other contexts or institutions. Besides, it is challenging to determine whether the differences in learning outcomes observed can be attributed exclusively to the teaching methods implemented. While the intervention period in our study spanned an entire semester, it is imperative to implement a cooperative teaching approach consistently across various classes to effectively assess the long-term impacts on learning outcomes and communication skills. In this context, although the application of cooperative teaching during a single academic semester is vital for attaining the intended results, it is insufficient on its own. Regular opportunities for student engagement in class discussions are also necessary to foster these skills. In a similar line, the familiarity of students with the knowledge test format (pretest-posttest design) may lead to improved scores on the posttest independent of the teaching method. The last but not least, the self-reported nature of questionnaires used in our study can cause response biases. This limitation is particularly relevant in educational settings, where students might feel pressured to conform to expected norms. For future research, we suggest incorporating observational methods alongside self-reported measures.

Future recommendations

To enhance the clarity and reliability of the findings presented in this study, it is essential to conduct more comprehensive research that includes larger cohorts of students across multiple institutions to increase the generalizability of the findings. An expanded participant base can facilitate the identification of trends and patterns that may remain obscured in smaller studies, thereby offering a more thorough comprehension of the effects of cooperative teaching approaches on varied student populations. In addition, the implementation of longitudinal studies has the potential to yield significant insights regarding the long-term impacts of cooperative learning on students' language proficiency and communication skills. By conducting assessments over an extended timeframe, researchers can analyze the effects of prolonged engagement with cooperative learning strategies on the retention of knowledge and skills. Furthermore, observational or qualitative investigations into the perspectives of students regarding the cooperative teaching approach may provide valuable insights into their nuanced understanding of this pedagogical method. Additionally, integrating quantitative and qualitative research methodologies could serve to corroborate the results obtained.

Conclusion

This study underscores the advantages of cooperative teaching in comparison to lecture teaching, particularly in improving student learning outcomes, communication skills, and attitudes within an English language course. To fully leverage these benefits, it is imperative for educators to incorporate cooperative learning techniques, such as group discussions and peer teaching, into their instructional frameworks. Furthermore, professional development programs are crucial for equipping educators with the necessary skills for effective implementation. Policymakers are encouraged to promote curriculum reforms that prioritize learner-centered approaches and to allocate resources that facilitate cooperative learning environments. Additionally, assessment practices should encompass performance-based evaluations to effectively gauge critical thinking and collaborative skills. By implementing these recommendations, educational institutions can cultivate a more interactive and effective learning atmosphere, especially in non-Western educational 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 humans were approved by this research was ethically approved by the ethics committee of Sirjan School of Medical Sciences with the code number IR.SIRUMS.REC.1402.031. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AB: Writing – original draft, Writing – review & editing, Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization. HB: Data curation, Conceptualization, Methodology, Software, Validation, Writing – review & editing. MD: Writing – original draft, Conceptualization, Methodology, Validation, Writing – review & editing. MHR: Writing – review & editing, Conceptualization, Methodology, Validation, Writing – original draft. NS: Writing – original draft, Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – review & editing.

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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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