

Research Article

Enhancing Student Engagement in the One-to-Five Peer Learning Model Among Second-year Chemistry and Mathematics Students at Wolkite University

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Abstract

This action research aimed to enhance student engagement in the One-to-Five peer learning model among second-year Chemistry and Mathematics students at Wolkite University. Although peer learning strategies have been introduced across Ethiopian higher education institutions, actual student participation has remained limited due to several persistent challenges. These included low awareness of the model's benefits, inadequate mentorship from instructors, poorly structured peer groups, lack of learning resources, and generally negative attitudes toward collaborative learning environments. To address these issues, the study employed a mixed-methods approach, utilizing questionnaires, direct classroom observations, focus group discussions, and academic performance records to gather comprehensive data. A census method was used, involving all 21 students from the target departments to ensure inclusiveness and accuracy. The intervention strategy consisted of structured awareness-raising sessions, consistent mentorship support, provision of relevant educational materials, and improved time allocation for peer group activities. Post-intervention evaluations demonstrated significant improvements in student attitudes, participation levels, and academic confidence. Students reported a stronger sense of ownership in the learning process and improved collaboration within their groups. These findings indicate that with the right support mechanisms, the One-to-Five peer learning model can be an effective strategy for enhancing student engagement and academic performance in university settings.

Keywords

Peer Learning, One-to-five, Active Participation, Active Learning, Cooperative Learning

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1. Introduction

1.1. Background of the Study

Peer learning is an educational approach in which students work together to support each other's learning and academic development. It involves the active exchange of knowledge, skills, and ideas among learners of equal status, typically within the same academic or social group [1]. Rather than relying solely on instructors, peer learning encourages students to take shared responsibility for their education. This collaborative method has deep historical roots in communal and cooperative learning practices, and it remains relevant today, especially in contexts seeking to promote student-centered learning [2].

Modern educational research highlights the significant benefits of peer learning. It fosters a deeper understanding of content, enhances critical thinking, encourages reflection, improves communication skills, and promotes teamwork and leadership qualities [3, 4]. When students take on teaching roles, they are more likely to engage with the material at a deeper level [5]. Furthermore, studies have shown that cooperative learning improves not only academic achievement but also essential social and cognitive skills [6, 7]. In Ethiopian Higher Education Institutions (EHEIs), the One-to-Five peer learning strategy has been promoted as part of a broader shift toward active and cooperative learning. This model encourages the formation of small groups where one student, often more advanced, supports four peers through regular discussion and academic collaboration. However, its implementation has not always yielded the desired outcomes. At institutions such as Wolkite University, many students perceive the model as a routine administrative requirement rather than a meaningful learning strategy. Others view it as burdensome, especially higher-achieving students who feel pressured to take responsibility for their peers. Instructors also sometimes prioritize lecture-based teaching over peer-supported learning.

These challenges suggest a disconnect between the intended purpose of the One-to-Five model and its actual practice. To bridge this gap, there is a need for research that examines student perceptions, identifies barriers to participation, and proposes interventions that can enhance the effectiveness of peer learning at the university level.

1.2. Statement of the Problem

Although the peer learning strategy-particularly the One-to-Five model-has been adopted in universities across Ethiopia, including Wolkite University, its implementation has not been entirely effective. Despite its potential to improve student engagement and academic outcomes, participation remains low. Contributing factors include large class sizes, insufficient orientation about the benefits of group learning, lack of structured support from instructors, and a general

perception among students that the model is ineffective or unnecessary.

Some students regard peer learning as a distraction from more productive independent study and often choose to spend their time elsewhere rather than participating in group activities. Moreover, a lack of motivation and support from educators compounds the problem, limiting the development of a collaborative learning culture.

This situation is particularly concerning in the Chemistry and Mathematics departments, where students are expected to serve as academic role models but often display passive attitudes toward peer learning. As a result, it is essential to investigate the root causes of low participation and develop practical strategies to improve engagement, especially among second-year students.

1.3. Research Questions

The study seeks to answer the following key questions:

1. How do students perceive peer learning in the context of One-to-Five groups?
2. What roles do students and teachers play in facilitating peer learning?
3. What are the main challenges that hinder student participation?
4. What strategies can improve engagement and the overall effectiveness of peer learning?

1.4. Objectives

General Objective:

To enhance student engagement in the One-to-Five peer learning model among second-year Chemistry and Mathematics students at Wolkite University.

Specific Objectives:

- 1) To evaluate students' perceptions of peer learning.
- 2) To identify the roles and responsibilities of both students and instructors.
- 3) To explore the challenges students face in participating in peer learning.
- 4) To propose viable strategies to enhance student involvement and collaboration.

1.5. Significance of the Study

This research holds value for students, educators, and academic institutions. For students, it aims to improve academic outcomes by promoting active participation, collaborative problem-solving, and the development of interpersonal skills. For instructors and academic planners, the study offers evidence-based insights into effective group management, student engagement strategies, and the importance of structured support in peer learning.

The findings can also serve as a resource for future action research by Higher Diploma Program (HDP) candidates, contribute to the work of quality assurance teams, and inform institutional efforts to refine teaching methodologies. Ultimately, the study contributes to improving the quality of education by strengthening the effectiveness of student-centered and cooperative learning methods.

1.6. Delimitation of the Study

This study is limited to second-year students from the Chemistry and Mathematics departments at Wolkite University. These departments were chosen due to the researchers' familiarity with the students and a noticeable lack of engagement in peer learning practices. The study was conducted over a two-month period, from March to May 2017. It focused on assessing perceptions, identifying challenges, clarifying roles, and implementing interventions to improve the effectiveness of the One-to-Five peer learning model. Data were collected through questionnaires, observations, and group discussions to ensure a comprehensive understanding of the issue.

2. Literature Review

Active learning encourages students to participate meaningfully in their courses. Peer learning strategies involve techniques like peer tutoring, small or large group discussions, and online feedback [8]. While many universities offer tutorials to supplement lectures, student engagement often remains low. Collaborative learning occurs when individuals work together to improve their own learning and that of their peers. Cooperation is most effective when students believe they share common goals and understand that their success depends on the group's performance. This fosters meaningful interactions where students motivate each other, provide feedback, challenge ideas, and explore various perspectives [9].

Peer learning offers opportunities for tutoring and feedback in less pressured settings, promoting communication and improving academic outcomes. Over the past 30 years, peer learning has gained attention, with research showing its academic and social benefits. Common strategies include peer tutoring, group discussions, and student-led classes, each with pros and cons depending on group dynamics [8, 10].

Peer tutoring usually involves defined roles focused on curriculum content. Some approaches include training and structured materials. Mentoring, often overlapping with tutoring, emphasizes one-on-one support, role modeling, goal setting, and collaborative problem solving. Cooperative learning, or group discussion, involves shared goals and tasks. Teachers often structure these with specific goals, roles, and rewards. Small, diverse groups work best with training to ensure equal participation and value. Strategies like the jigsaw method can reduce intergroup comparisons and en-

hance learning by promoting interdependence. Combining group goals with individual accountability often yields better results [1].

2.1. Students' Perception of Peer Learning/Networking

Many students hold negative perceptions of peer learning due to misconceptions, ineffective group use, and poor time management. Frustrations may arise when discussions feel repetitive, peers are unprepared, or when there's confusion over correct perspectives. Students often worry about missing key points and seek clarity from each session [9].

2.2. Significance of Peer Learning in the Teaching-Learning Process

Peer learning enhances student relationships and multicultural understanding. Open group environments encourage students to interact with diverse peers, fostering deeper discussions. Peer tutoring builds teaching and feedback skills while encouraging active participation beyond traditional lectures. Group work uncovers hidden talents and promotes richer insights [11].

Peer learning supports students' natural abilities [8] and transforms the learning environment, improving engagement and academic success. It enables comfortable communication, builds confidence, leadership, and group management skills. It also supports self-directed learning, emotional growth, and new thinking approaches, offering a valuable alternative to lecture-based methods [10].

2.3. Challenges to Student Participation in Peer Networks

Group work poses challenges during formation and participation, such as coordination, motivation, intellectual barriers, follow-up, and time management [12]. Coordination demands time and effort not needed for individual work-scheduling, decision-making, and integrating contributions. Diversity can complicate this, especially with language, cultural, or skill differences, though it also enriches group work [1].

Motivation issues like "free riding" or "social loafing" reduce group productivity and demoralize active members. Conflicts-whether subtle or direct-can also reduce morale and engagement [13]. Intellectual barriers include conformity, over commitment to initial plans, assuming clarity of one's ideas, and focusing only on shared information, which limits creativity and productivity.

2.4. Ways to Improve Student Participation in Peer Networks

Strategies to improve peer participation include mentor-

ship, supportive environments, good resource allocation, strong and diverse group formation, and academic or social rewards. Specific actions include:

- 1) Positive reinforcement for students who encourage participation.
- 2) Providing handouts and additional materials for group discussions [14].
- 3) Advising less active students and creating manageable schedules.
- 4) Thoughtful grouping-ensuring each group has academically capable members who can share and communicate effectively [15].

3. Methodology

3.1. Study Area Description

This study was conducted at Wolkite University (WKU), located in the Central Ethiopia Regional State (CERS), Gurage Zone. The university is approximately 170 km southwest of Addis Ababa, along the route to Jim-ma. At the time of the study, WKU offered undergraduate, postgraduate, and PhD programs. The target group consisted of second-year Chemistry and Mathematics students, totaling 21 individuals-18 males and 3 females.

3.2. Data Collection Methods

Both primary and secondary data sources were utilized. Primary data were collected through questionnaires and direct observations, providing insights into aspects such as participation in peer discussions, student perceptions of peer learning, interest in active participation, availability of learning materials, mentoring and advisory follow-ups, and the adequacy of time allocated for peer networking. Secondary data were obtained from academic journals, articles, reports, and books, offering supplementary information relevant to the study-such as attendance patterns during networking sessions and related findings that supported the research.

3.3. Sample Size Determination

The study targeted all 21 Chemistry and Mathematics students. Using Glenn's [16] guidance on small populations, a census approach was employed, allowing the inclusion of the entire group as the study sample. This method was appropriate given the small population size, as it eliminated sampling errors and ensured comprehensive data collection. These departments were selected based on their relevance to the research focus and because most researchers belonged to these departments, which facilitated smooth implementation and monitoring of the interventions.

3.4. Methods of Data Analysis

Both quantitative and qualitative methods were employed. Quantitative analysis addressed data such as the number of students participating in One-to-Five sessions, discussion days, and group distribution per section. Qualitative methods were used to interpret student perceptions, interests, and attitudes toward peer networks. Data from both primary and secondary sources were analyzed using descriptive statistics and thematic narrative analysis.

3.5. Action Plan

The action research aimed to improve student engagement in the One-to-Five peer learning model among second-year Chemistry and Mathematics students at WKU. To achieve this, an intervention plan was designed and implemented. Awareness sessions for both students and instructors emphasized the value of active peer learning and encouraged a supportive, collaborative learning culture. Students were motivated to ask and answer questions without fear of being incorrect, fostering confidence and critical thinking. Mentors received continuous guidance, and instructors were encouraged to engage actively in peer learning sessions. Monitoring and evaluation mechanisms were put in place to assess and adjust the intervention as needed.

3.6. Implementation of Action Plan

The intervention was implemented in phases throughout the semester. The initial phase included orientation sessions and demonstrations of the One-to-Five model. Instructors acted as facilitators, guiding students while allowing them to lead discussions and problem-solving tasks. Weekly peer learning sessions were scheduled, with designated group leaders responsible for facilitating discussions and tracking group progress. Digital platforms such as messaging apps and online forums were integrated to extend collaboration beyond classroom sessions. Mid-semester feedback from both students and instructors informed necessary adjustments to improve the process.

3.7. Evaluation

The intervention's effectiveness was evaluated using both quantitative and qualitative tools. Metrics such as participation rates, attendance records, and improvements in academic performance were analyzed. Surveys and focus group discussions captured student perspectives, while instructor observations offered additional insights into the implementation. The overall impact was assessed by comparing student engagement and academic outcomes before and after the intervention. Based on the findings, recommendations were developed to enhance and sustain the One-to-Five peer learning model for future cohorts.

4. Analysis, Interpretation and Discussion

In this chapter, the findings gathered from Chemistry and Mathematics students are analyzed, interpreted, and discussed. The major areas covered include the background of the respondents, students' perceptions towards the one-to-five peer learning method, the responsibilities of teachers and students in this cooperative learning strategy, the challenges students face that hinder their active participation, as well as a summary of the main findings and possible solutions. The discussion draws directly from the data collected through observations, questionnaires, and structured tables.

4.1. Participants and Gender Distribution

A total of twenty-one students participated in the study, all of whom were drawn from the Chemistry and Mathematics departments. These students constituted the primary cohort for examining perceptions toward peer learning and cooperative academic activities. The gender distribution of the respondents is summarized in Table 1 and Figure 1.

Table 1. Gender Distribution of Respondents (Chemistry and Mathematics Students, 2017).

Gender	Frequency	Percentage (%)
Male	18	86%
Female	3	14%
Total	21	100%

Although the gender breakdown was recorded, observa-

tional data revealed that a significant portion of the students lacked sufficient awareness and readiness to actively participate in peer learning strategies.

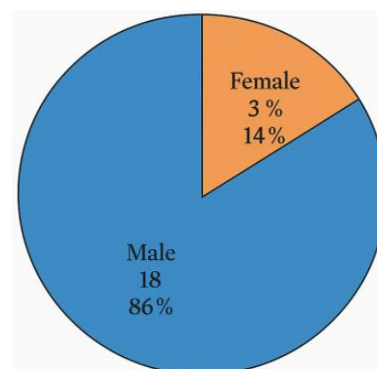


Figure 1. Gender Distribution of Respondents.

Table 2. Students' Awareness of the Importance of One-to-Five Networks.

Awareness Level	Frequency	Percentage (%)
Having awareness	11	53%
Lack of awareness	10	47%

As indicated in Table 2 and Figure 2, approximately 47% of the students lacked awareness regarding the importance of peer learning networks. Conversely, only 53% reported having some understanding of the value and implementation of such strategies. These findings highlight the necessity of providing students with foundational orientation and guidance to enhance the effectiveness and engagement in one-to-five peer learning methods.

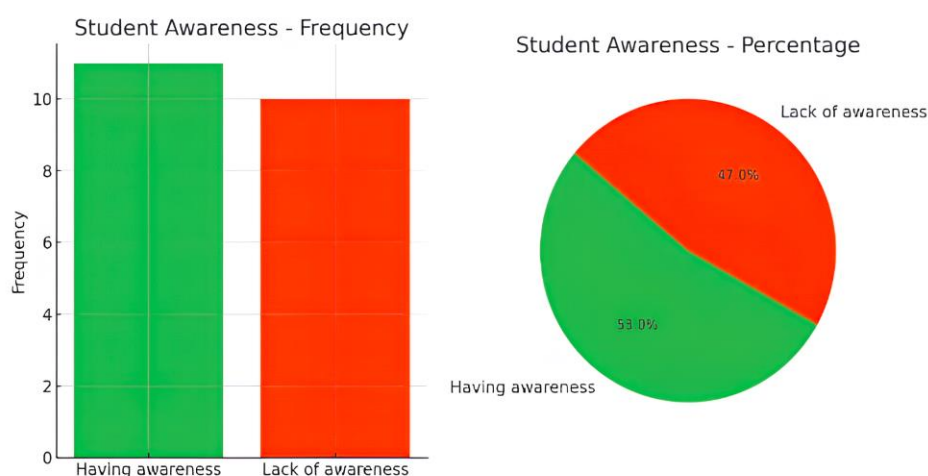


Figure 2. Student awareness about one-to-five peer-learning.

4.2. Students' Perceptions of One-to-Five Peer Learning

Analysis of students' perceptions revealed a generally negative attitude towards the one-to-five peer learning approach. Many students expressed reluctance to engage in group work, citing misunderstandings about its importance and confusion about how to efficiently utilize their time during group activities. Data collected from questionnaires, summarized in Figure 3, indicated mixed feelings about specific aspects of peer learning.

As the Figure 3 shows, while many students agreed that

group work is essential and beneficial (62% either strongly agreed or agreed), there remained significant skepticism, especially regarding the structured peer learning network itself. For instance, the statement "One-to-Five Peer Learning is beneficial" had a nearly even split between agreement (62%) and disagreement (38%), suggesting ambivalence. The most contentious item was whether mentors should only call on students who raise their hands 71% of respondents disagreed or strongly disagreed with this idea, indicating a preference for broader engagement.

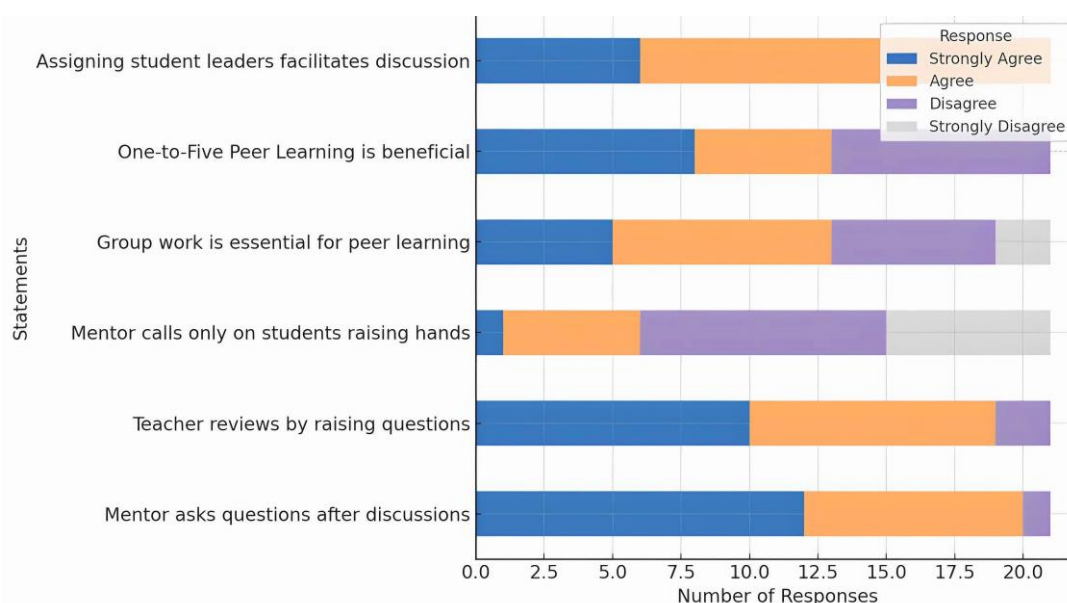


Figure 3. Students' Attitude toward One-to-Five Peer Learning.

Overall, about 90% of the students expressed some level of hesitation or disagreement with the full implementation of the one-to-five peer learning model. This outcome aligns with Herman's [9] findings that students often harbor misconceptions and negative perceptions about cooperative work. However, it contrasts with the more optimistic view presented by Gulfo, Obsa, and Sodo [10], who high-lighted student enthusiasm when such approaches are well-structured and supported.

4.3. Responsibilities of Teachers and Students in One-to-Five Cooperative Learning

The effectiveness of one-to-five peer learning is greatly influenced by the roles and responsibilities shared between both teachers and students. Teachers, in particular, play an essential role in setting up a conducive learning environment, guiding discussions, and providing the necessary support to students. Figure 4 illustrate the various responsibilities that teachers undertake in the context of students' peer network-

ing, highlighting how these roles are viewed by the students themselves.

Figure 4: Teachers' Responsibilities on Students' Peer Networking. From the figure, it is clear that students place high value on the guidance provided by teachers during peer discussions. A majority of students, 43% strongly agreed and 57% agreed that teachers should provide guidance and advice on discussions. This is an indication that proper teacher facilitation during discussions is crucial for student engagement and learning. Furthermore, the organization of students into effective groups is another responsibility that teachers fulfill; with 48% strongly agreeing and 52% agreeing that this is important. Effective group organization ensures that students can collaborate efficiently and learn from each other. Ensuring close supervision during discussions is also considered vital, with 71% of students agreeing that teachers should supervise discussions closely, though only 19% strongly agreed. This suggests that while students recognize the importance of supervision, it may not be as strongly emphasized compared to other teacher responsibilities. Teachers'

role in elaborating on discussion points was also highly valued, with half of the students strongly agreeing and half

agreeing that this responsibility contributes to the learning process.

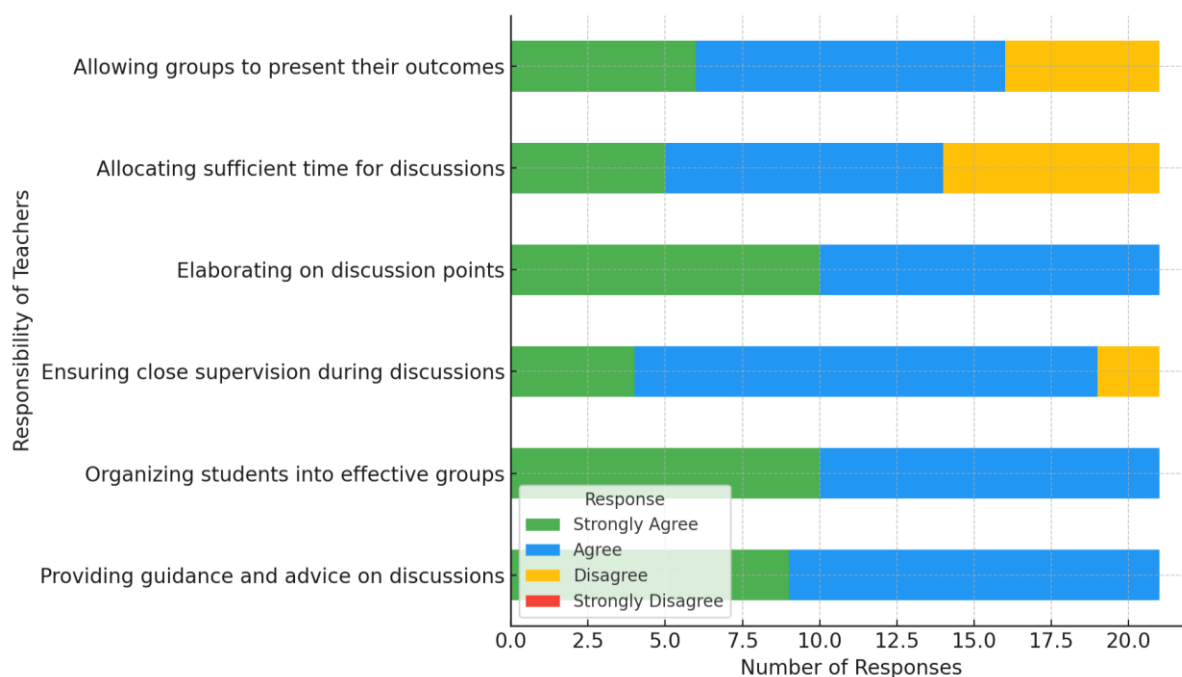


Figure 4. Teachers' Responsibilities on Students' Peer Networking.

In addition to organizing and guiding discussions, allocating sufficient time for discussions is considered important, but opinions on its execution were more divided. While 24% strongly agreed and 43% agreed that enough time should be allotted, 33% disagreed, highlighting that time management can be a challenge in the peer learning process. Lastly, allowing groups to present their outcomes is another responsibility where a majority, 48%, agreed, though 28% strongly agreed and 24% disagreed, indicating that this activity is useful but might not be a priority for all students.

4.4. Main Challenges Affecting Student Participation in One-to-Five Peer Learning

Despite the recognized benefits of peer learning, various challenges hinder students' active participation in the process. The challenges identified from the responses summarized in and Figure 5 reveal multiple factors that impede effective peer learning engagement.

The most significant barrier identified by the students was a lack of confidence in sharing ideas; with an overwhelming 95% of respondents indicating that they felt uncomfortable expressing their thoughts in group discussions. This lack of confidence is a major obstacle, as it prevents many students from fully engaging in peer learning activities. Language barriers, affecting 62% of the students, also contributed to this issue, as students struggled to articulate their ideas effec-

tively, which further diminished the quality of discussions. Another key challenge was the absence of course instructors during peer learning sessions, cited by 48% of the respondents. The lack of instructor presence left students feeling unsupported, which likely diminished their motivation and engagement. Furthermore, 43% of students indicated a lack of awareness about peer learning, which suggests that many students may not fully understand the benefits or structure of peer learning, making it harder for them to participate actively.

Time inefficiency was another challenge affecting 33% of students, particularly high-achieving ones. These students felt that discussions slowed their pace of learning, which may have led to disengagement. Additionally, insufficient discussion materials (19%), inadequate space for discussions (14%), and ineffective mentoring (10%) were identified as contributing factors, though they were less commonly reported. To address these challenges, a multifaceted approach is required. One effective solution could involve boosting students' confidence through encouragement, offering small public speaking tasks, or providing safe spaces for practicing idea sharing. Additionally, offering language support classes would help students overcome communication barriers and articulate their thoughts more clearly. Structured mentoring programs could also be put in place to guide students more effectively during discussions, ensuring that peer learning remains productive and engaging.

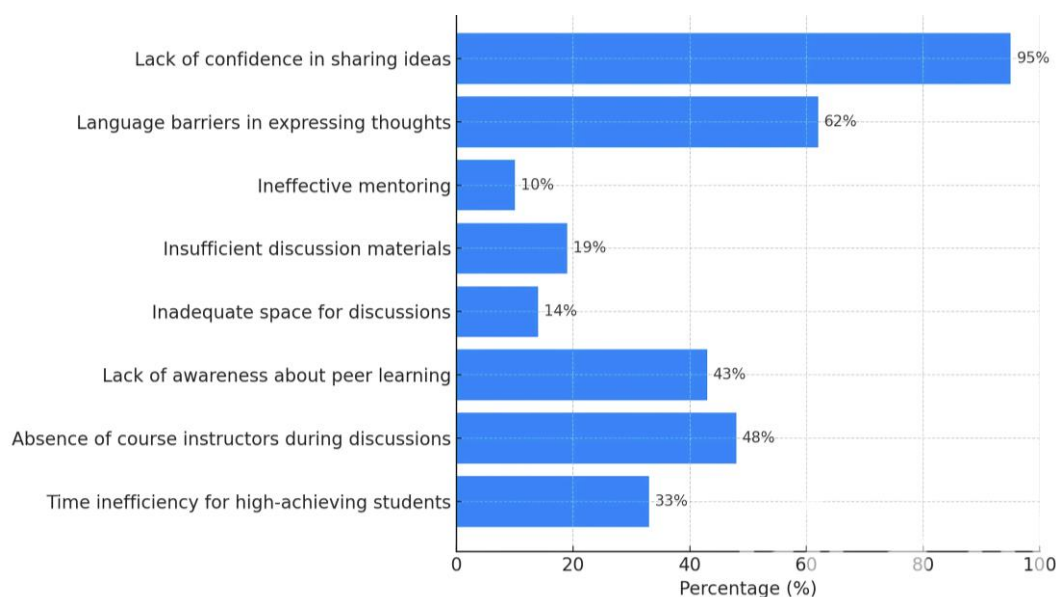


Figure 5. Challenges affecting active participation in peer learning.

Moreover, ensuring that course instructors are present during peer learning sessions is essential for providing ongoing support and guidance. Increasing awareness about the benefits of peer learning through better orientation and training would also help students engage more meaningfully. On a practical level, improving physical learning environments, such as providing adequate space and materials, can further facilitate smoother discussions. Activities like structured debates, role plays, and group presentations would also encourage broader participation and make peer learning sessions more dynamic and inclusive. As Peter Goss and Sonnemann [17] highlighted, strong learning environments that set high expectations and promote collaborative engagement are key to enhancing student participation. Addressing these challenges will foster a more effective and inclusive peer learning experience, ensuring that all students can actively contribute and benefit from the process.

4.5. Major Findings

Based on the data collected from both students and teachers, several significant findings have emerged, shedding light on key areas that require attention and action to enhance the peer learning experience at Wolkite University. The primary findings are as follows:

Limited Awareness among Students: Many students lack sufficient understanding of the benefits and processes involved in peer networking. This limited awareness has led to low engagement levels.

Lack of Confidence in Sharing Ideas: A considerable number of students exhibit hesitation or reluctance to actively participate in discussions due to a lack of confidence in presenting their ideas or answering questions.

Weak Mentoring and Advising Systems: There is a noticeable gap in effective mentoring during peer learning sessions,

which affects the overall learning outcomes.

Inadequate Distribution of Discussion Materials: The absence of structured, timely learning materials (e.g., worksheets) has hindered students' ability to engage deeply in discussions.

Insufficient Time Allocated for Discussions: Peer learning activities are often rushed due to a lack of time, preventing students from fully exploring the topics or engaging meaningfully in discussions.

Absence of Teachers or Course Owners during Peer Discussion Sessions: The absence of academic support during peer learning sessions reduces the quality of student interactions and undermines the intended outcomes of the peer learning strategy.

4.6. Possible Solutions to the Challenges of Peer Learning

Having identified the challenges facing peer learning at Wolkite University, we propose several solutions that target these specific issues and aim to improve the overall peer learning experience.

A. Raising Awareness

A primary obstacle to effective peer learning is the lack of awareness among students about the importance of peer networking. In our study, 74% of students expressed negative perceptions of peer learning, often stemming from misconceptions. To address this, we propose an awareness campaign focused on educating students about the benefits and strategies associated with peer learning. This campaign will include training sessions that highlight how peer learning can improve academic success and contribute to university goals. These sessions will be delivered every Friday from 2:00 PM to 4:30 PM, with the support of academic leaders such as

department heads and teachers. Providing students with structured guidance will help cultivate a deeper understanding of peer learning and encourage active participation.

B. Enhancing Confidence

A significant barrier to active peer learning is the lack of confidence among students in sharing their ideas and answering questions. In our findings, many students were reluctant to participate in discussions due to fear of making mistakes, shyness, or lack of experience speaking in front of peers. To address this issue, we propose a supportive strategy aimed at building students' confidence through structured encouragement and inclusive participation practices.

Confidence-building measures will include:

- 1) Encouraging all students to contribute to group discussions by creating a non-judgmental environment.
- 2) Assigning rotating presentation roles within groups so that each member gains experience speaking in front of others.
- 3) Incorporating brief Q&A sessions after each group presentation to foster active listening and interaction.
- 4) Providing positive reinforcement and constructive feedback to validate students' efforts and reduce fear of mistakes.
- 5) Recommending diverse reading materials to help students better prepare and feel more informed during discussions.

C. Encouraging Mentorship to Facilitate Peer Discussions

Effective peer learning cannot be achieved without proper mentorship. Teachers should take an active role in guiding and supporting students during their learning sessions. Regular mentorship through coaching, monitoring, and advising can significantly enhance the effectiveness of peer discussions. Teachers should not only act as overseers but also as active participants who provide feedback and in-sights. To implement this, mentorship workshops will be organized, focusing on how to engage students during group discussions and ensure a productive learning environment.

D. Providing Structured Learning Materials

To overcome student passivity and foster deeper engagement, structured learning materials such as worksheets should be introduced. These materials can include:

Short notes on key concepts; Discussion questions; Essay-based prompts

We propose distributing these materials on a weekly basis (every Thursday or Friday) to ensure that students have the resources they need to engage meaningfully in discussions. This initiative will involve collaboration between course instructors and mentors to ensure the relevance and quality of the materials. In the subsequent phase of this study, we will evaluate whether this approach increases student participation and enhances the learning experience.

E. Implementing a Strong Follow-Up System

Even when mentors are present, some students remain disengaged, engaging in off-topic activities such as chatting, using phones, or simply not participating. To address this, we

will implement a follow-up system aimed at ensuring active engagement. The system will focus on:

- 1) Raising awareness about engagement expectations.
- 2) Offering counseling and encouragement to students displaying arrogance or disengagement.
- 3) Restructuring groups if necessary to ensure balanced participation.
- 4) Motivating passive listeners to contribute, even if their answers are incorrect.
- 5) Providing a supportive environment for students who are shy or afraid to participate.
- 6) Addressing poor communication skills by encouraging more open discussions.

Additionally, course instructors will be invited to introduce thought-provoking topics that encourage deeper discussions, further stimulating engagement and critical thinking.

4.7. Action Plan / Plan of Action

Based on the identified findings, we have developed a comprehensive Action Plan to address the challenges in peer learning and improve the effectiveness of the one-to-five learning network. Below are the detailed actions that will be taken, including timelines and responsibilities:

Lack of Awareness:

- 1) Action: Organize an awareness campaign to educate students about peer learning.
- 2) Timeline: Sessions to be held every Friday from 2:00 PM to 4:30 PM.
- 3) Responsible Parties: Researchers, HDP leaders, department heads, and teachers.
- 4) Resources Needed: Training materials, worksheets, pens, and a projector.

Lack of Confidence:

- 1) Action: Motivate students to engage in discussions by encouraging them to ask and answer questions without fear of mistakes.
- 2) Timeline: Sessions every Friday from 2:00 PM to 4:30 PM.
- 3) Responsible Parties: Researchers, group leaders, and teachers.
- 4) Resources Needed: Open-ended question worksheets, pens, and other basic materials.

Weakness in Mentoring:

- 1) Action: Provide training for mentors to improve their support for students during peer learning sessions.
- 2) Timeline: Training to take place on September 10, 2022.
- 3) Responsible Parties: Researchers, teachers, and mentors.
- 4) Resources Needed: Mentoring guidelines and assessment tools.

Lack of Worksheets:

- 1) Action: Prepare and distribute structured worksheets to students every Friday.

- 2) Timeline: Weekly distribution of worksheets on Fridays from 2:00 PM to 4:30 PM.
- 3) Responsible Parties: Researchers, teachers, and mentors.
- 4) Resources Needed: Worksheets, pens, and papers.

Shortage of Time:

- 1) Action: Allocate sufficient time for peer learning by creating a consistent schedule.
- 2) Timeline: Permanent scheduling of peer learning activities every Friday from 2:00 PM to 4:30 PM.
- 3) Responsible Parties: Department head and academic leaders.
- 4) Resources Needed: Timetables and schedule coordination.

Absence of Teachers/Course Owners:

- 1) Action: Ensure teacher presence during peer learning sessions by enforcing attendance policies.
- 2) Timeline: Implement by May 12, 2025.
- 3) Responsible Parties: HDP coordinators, department heads, and course instructors.
- 4) Resources Needed: Attendance tracking system and academic calendars.

By systematically addressing these challenges with a targeted action plan, we aim to improve the peer learning experience for students and align our strategies with the educational goals of Wolkite University.

4.8. Implementation and Evaluation of the Proposed Solutions

4.8.1. Implementation

In this section, we will discuss the actions taken to address the challenges hindering the participation of Chemistry and Mathematics students in peer learning, specifically within the context of the one-to-five network. Following the identification of the problems, we proceeded with proposing and implementing solutions to improve the overall student experience in peer learning activities. These proposals are aimed at addressing the core issues and fostering an environment that encourages more active participation and effective learning.

4.8.2. Creating Awareness for Students

As discussed earlier, a significant challenge faced by students was their lack of awareness about the benefits and processes of peer learning. In response, we focused on educating students about the advantages of peer learning, including its ability to enhance academic performance, improve social interaction, increase student retention, boost satisfaction, and elevate self-esteem. Over the course of two weeks, we provided brief training sessions to each student group, guiding them on how to apply group strategies like cooperation and cross-group interaction. These strategies were designed to foster an environment where students could develop vital

social skills, such as re-solving conflicts, helping newcomers, listening, contributing ideas, and encouraging others. Through this awareness campaign, students' understanding of peer learning improved, and their participation began to increase.

4.8.3. Improving Students' Confidence

A lack of confidence was identified as another major barrier to active participation, with many students hesitant to share ideas or engage in discussions. To address this, we created a more supportive and interactive classroom environment. We encouraged all group members to participate, ensuring that leaders did not dominate the discussions. After each group discussion, we required each member to present for five minutes, followed by a Q&A session to help boost their confidence in speaking and answering questions. We also motivated students to read diverse materials, provided positive feedback, and encouraged them to speak freely. This approach aimed to alleviate stress and shyness, helping students develop both academically and socially.

4.8.4. Initiating Mentors to Facilitate Peer Discussions

Another challenge we encountered was the ineffective mentoring system, where some mentors were not fully engaged with the students or were not actively managing the discussions. We conducted meetings with the student mentors to address these issues. It became clear that while mentors understood the importance of peer networks, they were not always proactive in encouraging all students to participate. Some students, due to language barriers, fear, or lack of confidence, either dominated discussions or were passive listeners. To improve the situation, we emphasized the importance of active group management, encouraging mentors to engage with all students and ensure equal participation. We also advised mentors on how to address specific issues such as non-participation or group imbalances, ensuring a more effective peer learning environment.

4.8.5. Reducing the Weakness of Student Group Arrangement

The arrangement of student groups also played a crucial role in peer learning effectiveness. We observed that some students, due to differences in academic abilities or behaviors, were either too passive or too dominant in their groups. To address this, we restructured the groups, ensuring a balance of high-performing, medium, and low-performing students. Additionally, students exhibiting disruptive behavior or passivity were reassigned to different groups to ensure a more balanced dynamic. We collaborated with the department head, teachers, and mentors to implement these changes and create groups that were better suited to foster collaboration and engagement.

4.8.6. Preparing Worksheets

The preparation of worksheets was another key strategy designed to increase student participation. We provided teachers with worksheets that included discussion questions, subject material, and problems that were relevant to upcoming exams. These worksheets were distributed to each group of 22 students every week during the one-month peer learning session. The worksheets encouraged students to prepare in advance, engage more deeply in the discussions, and share their ideas. We found that students became more motivated and actively participated when the worksheets were aligned with their exam schedules and subjects. This method led to a noticeable improvement in participation levels, as students were more prepared and focused during the networking days.

4.8.7. Allocating Appropriate Time

Time constraints were a significant issue in previous peer learning sessions, with students expressing that the 1.5-hour session was insufficient to cover the material or fully engage in discussions. To overcome this, we extended the discussion time from 2:00 PM to 4:30 PM, allowing students more time to delve deeper into the subject matter and engage in meaningful conversations. This extension gave students the opportunity to discuss multiple topics and complete their worksheets without feeling rushed. Moreover, we encouraged students to utilize additional time outside of the scheduled peer learning sessions to further discuss and clarify topics, promoting continuous engagement.

4.8.8. Motivating Teachers to Be Present During Networking Time

One of the most significant issues identified was the absence of teachers during peer learning sessions. Students often felt disengaged and unmotivated without the presence of a teacher to guide the discussions and clarify complex topics. To address this, we met with teachers and the department head to emphasize the importance of their presence during peer networking days. Teachers were encouraged to attend these sessions not only to answer questions and provide additional insight but also to help build stronger teacher-student relationships. Their involvement was crucial in boosting student confidence and ensuring that the peer learning process was effective. Teachers were informed of their responsibilities a day before the networking day to ensure they were prepared to engage with the students.

4.9. Evaluation of Intervention

After implementing the proposed interventions to enhance the effectiveness of the one-to-five peer learning network, a noticeable shift in student participation and engagement was observed. Initially, many students were disengaged and showed little interest in the peer network. However, following the introduction of solutions like increased awareness about the importance of peer learning and additional support structures, a marked improvement was observed in student attitudes. Figure 6 summarizes the results from subsequent student feedback, illustrating this positive transformation.

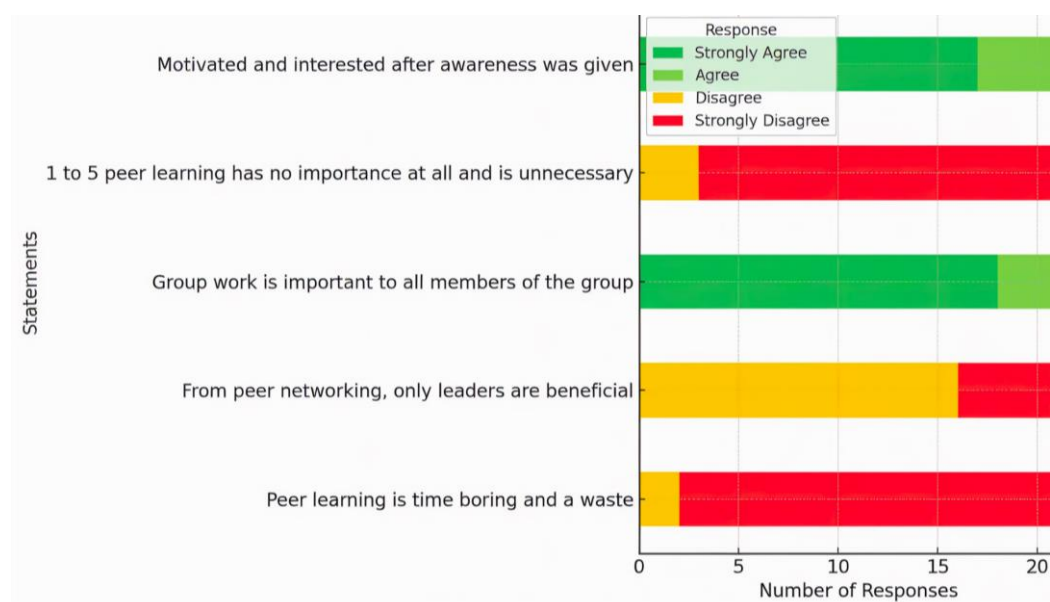


Figure 6. Students' attitudes toward one-to-five peer learning after intervention.

As seen in Figure 6, the majority of students (90%) no longer viewed peer learning as a waste of time, with only 10% disagreeing with the statement that it was boring. This signif-

icant shift highlights the effectiveness of the intervention in addressing initial disengagement. Additionally, 91% of students acknowledged that peer learning was beneficial for all

group members, not just the leaders, which suggests that the awareness campaigns successfully communicated the collaborative nature and collective benefits of the peer learning process. The survey also indicated a marked decrease in the number of students who believed that peer learning had no value or was unnecessary, with 86% disagreeing with this view. This is a substantial improvement compared to the pre-intervention phase. Furthermore, 81% of students strongly agreed that they felt motivated and interested after becoming more aware of the pro-gram's benefits, reinforcing the success of the awareness campaign in increasing engagement and enthusiasm for peer learning.

These results demonstrate that when students are properly informed about the value of peer learning and provided with the necessary support, their attitudes toward the learning process improve significantly. The interventions, particularly the awareness campaigns, have proven to be effective in transforming students' perceptions and increasing their participation and enthusiasm in the peer learning network.

5. Conclusion and Recommendation

5.1. Conclusion

The findings of this action research clearly demonstrate that the One-to-Five peer learning approach can significantly enhance student participation and engagement when supported by effective awareness campaigns, structured learning materials, mentorship, and adequate time allocation. Initially, many students held negative perceptions of this method, citing issues such as lack of confidence, unbalanced group dynamics, and minimal teacher involvement, which all contributed to low levels of participation. However, through targeted interventions including awareness training, improved group structures, mentorship, and consistent follow-up students became more motivated and actively engaged in the peer learning sessions.

Post-intervention data revealed a positive shift in students' attitudes, with a noticeable increase in their collaborative learning behaviors. These results underscore that the success of peer learning is highly dependent on the active involvement of both educators and students, alongside strong institutional support. To ensure the continued success and further improvement of this approach, it is recommended that universities integrate peer learning into their academic programs with clear guidelines, regular training sessions, and ongoing monitoring. This strategy not only enhances academic achievement but also helps students develop essential soft skills such as communication, leadership, and teamwork.

5.2. Recommendations

Based on the study findings, several key recommendations are proposed. First, universities should formally integrate the One-to-Five peer learning strategy into their academic struc-

tures, supported by clear operational guidelines and expectations. Regular training sessions and capacity-building workshops should be organized for both students and instructors to ensure they fully understand the process and benefits of peer learning. Teachers must also take an active role in facilitating group work by providing mentorship, guiding discussions, and offering timely feedback. Additionally, institutions should ensure the provision of necessary resources, such as discussion worksheets, markers, and appropriate physical spaces to support effective group activities. A robust system for monitoring and evaluation should be put in place to assess participation levels and group effectiveness, with adjustments made as needed. Finally, universities are encouraged to recognize and reward active student involvement in peer learning, as this can significantly boost motivation and reinforce positive engagement.

Abbreviations

EHEIs	Ethiopian Higher Education Institutions
HDP	Higher Diploma Program
WKU	Wolkite University
CERS	Central Ethiopia Regional State

Author Contributions

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Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

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Conflicts of Interest

The authors declare no conflicts of interest.

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