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KEYWORDS	ABSTRACT
Classroom Discussion Practices, Higher-Order Thinking Skills (HOTS), Classroom Participation & Peer Interaction	Classroom discussion practices are considered a key pedagogical strategy to develop & promote students' higher-order thinking skills. Development of higher-order thinking skills has become a central concern in the higher education especially at university level, as these skills enable students to analyze, evaluate, and create knowledge effectively. The purpose of study was to examine relationship between classroom discussion practices and development of higher-order thinking skills among university students. The study was quantitative in nature and based on a correlational research design. A stratified random sampling was used to select the sample of the study. A self-developed questionnaire based on theoretical framework was used to collect data from 400 university students. Pearson correlation analysis ($r = .589, p < 0.01$) showed moderate positive relationship between these two variables. The findings indicated that peer interaction during classroom discussion practices have significant effect ($R^2 = .398, F(3,396) = 87.18, p < .001$) on development of HOT. Result show that effective classroom discussion practices significantly contribute to the development of higher-order thinking skills among university students. It is recommended that instructors incorporate structured and interactive discussion techniques in their teaching practices.
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INTRODUCTION

Higher-order thinking skills (HOTS) in education are not a recent development; students have been taught to think critically since the days of Socrates (Gupta & Mishra, 2021). Those skills can be developed in university classroom setting through actual utilization of various types of classroom discussion practices. According to Pujiastuti and Haryadi, (2023) higher-order thinking skills are

considered to be one of the key objectives of an educational institution, and they aim to cultivate these skills during the educational instructional process. The students who can formulate novel productive ideas, develop rational responses are the ones who have higher-order thinking skills. These classroom discussion practices encourage them to seek more recent knowledge and get the answers of problems on their own. The higher-order thinking skills have been focusing of education. Thus, these skills are valuable to develop problem solving techniques among the students (Samadi, Jafarigohar, Saeedi, Ganji & Khodabandeh, 2024). For this purpose, classroom discussion practices play an essential role and ensure that knowledge is not just passed but is co-constructed in the process of interaction.

Such practices enable students to approach a problem differently and have more than one possible solution. The students participate in classes and take part in discussion activities but these activities can be enhanced by using the classroom discussion practices. Moreover, these practices create an organized and structured or unstructured discussions according to the classroom objectives as well as environment in which both teacher and students share mutual responsibility and participate. Similarly, Cui and Teo, (2023) described classroom discussion practices like structured classroom discussions, purposeful questioning and reflective dialogue and peers' interaction are key factors that help students develop higher-order thinking skills. The online classroom discussion systems, originally developed as supplementary tools for the distance education, later evolved into a central pedagogical model in the higher education, where they are increasingly used not only for syllabus delivery but also for fostering the critical thinking, collaboration, and active student engagement through structured interactional strategies (Rivera, Smart, Sakaria & Wray, 2021; Higgins, Taylor, Rocco & Kimel, 2022).

Empirical research indicates that structured online discussion practices such as group work, student presentations, guided Q & A sessions enhance cognitive engagement and knowledge, particularly when integrated with breakout rooms and collaborative digital platforms that support interactive learning processes (Lukashe, Chigbu & Umejesi, 2024). Online classroom discussion practices are essential part of instruction, as they extend traditional classroom discourse into structured digital learning environments. Universities are expected to prepare students with advanced cognitive abilities. Empirical evidences highlighted, these skills foster through effective classroom discussion practices from multiple perspectives, and formulate solutions to complex problems. The classroom discussion may be understood as structured or semi-structured pedagogical process through which students, teachers exchange ideas, questions, arguments, explanations, interpretations & experiences related to academic content. Such practices enable students develop skills such as; critical thinking, problem-solving, express their viewpoints, and develop possible solutions through careful reflection (Rahmi & Azrul, 2022).

Research Objectives

1. To identify the classroom discussion practices used by teachers at university level.
2. To analyze the level of higher-order thinking skills among the university students.
3. To determine relationship between CDP & development of HOTS among students.

Research Questions

1. What classroom discussion practices are used by concerned teachers at university level?
2. What is level of higher-order thinking skills in the students during classroom discussions?
3. What is relationship between CDP and development of HOTS among university students?

LITERATURE REVIEW

Classroom Discussion Practices

One of the most commonly used pedagogical strategies is classroom discussion that is often used as the core teaching strategy (Leese & Rosen, 2025). Classroom discussion is interactive and dynamic process that is dialogue-driven and known be effective in learning (Calcagni et al., 2023). It entails verbal communication between teachers and students and students among themselves. The role of classroom discussion thereby important in the students' personal development, independence, social interaction & communication skills. Rahmat and Jon (2023) discovered that supportive interactive learning environment can enable students to connect, actively contribute to knowledge, and share experiences. Classroom discussion is the typical strategy used in a university setting since it enables students to build meaning through interaction with their teachers and peers (Setiyono et al., 2026). Empirical research indicated that when teachers structure discussion-based practices, like guided peer discussions, or inquiry-based dialogues, students demonstrate significant advances in critical thinking, analytical reasoning, as well as evaluative judgment (Utami et al., 2025; Le and Nguyen, 2024). According to the Institute of Learning and Teaching (2026), classroom discussions present a designed setting that promotes the higher-order thinking of the students towards the issues under discussion in classroom.

Types of Classroom Discussion Practices

Classroom conversations are not something that can happen spontaneously (Columbia Center for Teaching and Learning, 2021). This implies that classroom discussion should be well put to meet the desired learning objectives. Structured classroom discussion practices are therefore such discussion practices or methods that allow students to interact with other students in systematically planned rules and guidelines. The students who participate in Socratic inquiry seminars significantly have positive influence on their higher-order thinking skills, such as interpretation, analysis, evaluation, and self-regulation (Bahtiyar & Can, 2021). In current higher education, the Socratic questioning is used in seminar modalities as instructor inquiries are used as cognitive scaffolds that gradually increase thinking level of students to description, analysis and evaluation (Kaur & Singh, 2024). The teacher-led discussion helps structure classroom discussions in alignment with educational objectives that promotes students' collaboration & reasoning skills during lecture (Mercer & Howe, C., 2021). The researches indicated that guided dialogue and teacher questioning strategies play a productive role in improving the critical thinking, reasoning, and metacognitive awareness (Hattie, 2023; Gillies, 2022).

The teacher-led (dialogic) discussion can enhance student involvement, conceptual knowledge, and higher-order thinking in an effective, well-structured, and guided way (OECD, 2021; UNESCO, 2023). It is three step active learning strategy designed to enhance the student engagement and

participation. It involves individual thinking followed by discussion in pairs and then sharing with the whole class (Waqar et al., 2025). It is designed to promote active participation, collaboration and engagement that improve students' mutual understanding and develop independent cognitive abilities. It enables them to improve, build understanding by participating in meaningful discussion practices (Homayouni, 2022). This process further supports development of higher-order thinking skills analysis, evaluation, creation among those students who actively take part in these practices. Concept and mind mapping are both visual methods that assist students in organizing, representing, and linking ideas. These tools foster active interactions as inspire learners to organize knowledge in a hierarchical and relative way. Thus, during classroom discussions, teachers can help students to develop and describe their maps, promoting the group learning and enhanced conceptual insight (Waqar, et al., 2025)

Unstructured Discussion Practices

Classroom discussions practices, when unstructured, can be more relaxed and less premeditated and there be no definite task or strict rules to be followed (Sage, 2020). In this linking, such dialogues or discussions are incorporating unstructured formats, promoting the students to discuss, reflect and express various opinion in a more relaxed setting. The small-group discussion is a technique where students are divided into grouped and small sub groups (usually 3 to 6 learners) to discuss a specific topic. They ask question, and discuss with the goal of exchanging ideas. This clarifies their thoughts, and develop shared understanding in more personalized space than whole-class discussion (SKOER, 2020; Teaching Works, 2022). In this connection, the open classroom discussion is a type of oral activity where learners and the instructor engage in the communication with each other around a specific topic, wherein turn-taking and additional contributions being flexible and open-ended to enhance critical thinking and construct shared meaning of concepts (Sass, 2022; Smart Classroom Management, 2025).

Online & Hybrid Discussion

The increased growth of online learning communities since COVID-19 has added to online and hybrid discussion formats, like synchronous video seminars, and AI-supported dialogue platforms as notable new settings. Hmelo et al. (2023) discovered that meaningful HOTS objectives were achieved with online discussion as compared to passive instruction, but objectives were somewhat lower than those achieved in face-to-face environments. Structured online discussion forums are such practices in which discussion is shaped over organized instructions and guided participation mechanisms that improve engagement, reasoning quality in asynchronous communication contexts (Coker, 2022). The discourse analysis research further indicated that structured online discussion practices influence communication networks students, resulting in coherent and interconnected knowledge exchange (Yee et al., 2023). Klein and Majdoubi (2024) described that structured online discussions can reduce noise & distraction while increasing deliberative quality by enforcing clearer participation pathways. In case of universities with limited resources and high enrollments, online pre-discussion practices followed by face-to-face synthesis seminars, hybrid models may be an efficient way to discussion-based environment for enhancing the higher-order thinking skills (Zainuddin et al., 2022).

Teachers' Role in Classroom Discussion Practices

There is a diversity in teachers' role as a facilitator, guider and mentor. This suggests that the key to a successful classroom discussion lies in teachers' role as a facilitator (Mercer & Howe, 2023). The teacher, as a facilitator, creates an interactive environment through use of teacher-led discussion patterns enabling students to exchange perspectives, and explore new ideas in order to identify solutions to problems. In this linking, this suggests that teacher-led discussion, when employed within a facilitative classroom environment, can effectively moderate the classroom interaction and significantly enhance the students' participation, particularly when feedback and questioning are well-organized (Hattie & Clarke, 2023). Nevertheless, the teacher as a mentor, is one who also promotes the students' academic and personal development. Classroom discussion is also directed by teachers, who determines when to interfere, in what order to arrange the responses of students, how to maintain focus on the disciplinary concepts within the diverse complex discussion processes (Sedova et al., 2023).

University Students' Participation & Engagement in Classroom Discussions

The involvement of students and their cognitive process is a major consideration in the development of higher-order thinking skills (HOTS) especially at university level. Students are required more active & engage in different discussion activities at this level. Active and meaningful participation of university students helps them to develop higher cognitive level skills like analysis, evaluation, and creation. The recent research studies explored the three categories of student engagement: behavioral engagement (frequency and duration of student participation), cognitive engagement (degree of thought as evidenced in contributions), as well as affective engagement (motivation and feelings of students toward participation). Cognitive engagement is the most powerful predictor of HOTS development among them (Clarke & Thomas, 2023). Li (2026) has mentioned in his study that student-centered and discussion-based learning can greatly enhance classroom engagement and participation. Similarly, additional research (Ga et al., 2025; Chacon et al., 2023) also stated that the student-led classroom settings enhance engagement and motivation, particularly when accompanied by guidance & directions that enhance engagement, peer connection and classroom objectives results.

Higher Order Thinking Skills (HOTS)

The higher-order thinking skills (HOTS) are advanced level of cognitive skills including analysis, evaluation, and creation, which allow learners to critically analyze information, make a justifiable judgment, and create innovative solution to complex problem (Aziz & Rawian, 2022). According to Anderson and Krathwohl (2001), HOTS have three key skills namely; analyzing, evaluating and creating. HOTS do not focus on memorizing knowledge; instead of they demand students be actively engaged in questioning, evaluating, elaborating, and applying it differently (Rahman et al., 2021). In this regard, critical thinking comes under umbrella of higher-order thinking skills (Yildirim & Simsek, 2024). Moreover, higher-order thinking skills (HOTS) entail the combination of critical, creative, as well as reflective thinking, which allows students to learn new ways and make decisions purposefully, mainly in dynamic learning environment (Wang et al., 2024). These competencies are nowadays extensively demanded, especially in university students, as essential part of 21st century education, as they facilitate in-depth comprehension, flexibility, and generalizability of knowledge

in various settings (Yanti & Thohir, 2024). They are basically consists of three dimensions analysis, evaluation and creation.

Table 1 Revised Cognitive Dimensions of HOTS by Anderson and Krathwohl (2001)

No.	Dimensions	Description
1.	Analysis	The students break information into smaller parts, identify relationship among various ideas and understand concepts deeply.
2.	Evaluation	The students judge ideas, assess evidence, as well as make the logical decisions.
3.	Creation	Students generate new ideas, develop productive solutions to problems, and apply their knowledge effectively.

Note. The table is based on information from previous research studies.

In addition, HOTS have been gaining importance in higher educational context since, they need a cautious interpretation of information and its implementation in the decision-making processes (Cui & Teo, 2023). In addition, they also enhance critical thinking, promote innovation and overall cognitive development, thus, allowing students to cope with complex situations logically, make decisions & adjust to new challenges. The holistic growth of HOTS therefore demands pedagogical strategies that can allow the involvement of multiple cognitive processes simultaneously, which makes discussion in classroom more effective among students (Zainuddin et al., 2022). Moreover, these skills not only improve and encourage independent thinking in university students, as they allow organizing and clearly stating their ideas, questioning assumptions, formulating independent reasoning, developing problem-solving skills, that leading towards personal as well as professional development, but also improve communication skills and the ability to interact effectively with the real-world problems.

Barriers to Implementation of CDP for HOTS

Despite strong theoretical and empirical support for discussion-based learning, multiple barriers hinder its effective implementation in higher education contexts. One major barrier is prevalence of teacher-centered instructional practices, which limit opportunities for student interaction and active engagement (Trigwell, 2022). In such environments, instructors lead classroom discourse which reduce the meaningful student interaction and participation. Previous studies stated that lecture-based teaching remains widespread, particularly in university classes, thereby restricting dialogic learning opportunities (Stains et al., 2021). Another critical issue is limited use of higher-order questioning techniques. Teachers often rely on recall-based questions, which do not stimulate critical thinking or discussion (Tofade et al., 2021). The empirical researches showed that insufficient questioning strategies significantly reduce the effectiveness of classroom discussions in promoting HOTS (Song, 2022). Institutional constraints pose significant challenges, include large class sizes, time limitations, rigid curricula, and assessment systems that prioritize factual analytical thinking (Admiraal et al., 2021).

Such constraints discourage instructors from adopting interactive teaching methods that require more time & effort to implement effectively. Student-related factors further obscure implementation

of discussion-based practices. The lack of confidence, fear of making mistakes & language barriers often prevent students from actively participating in discussions (Nguyen et al., 2022). Moreover, unequal participation patterns, where a few students dominate discussions, can limit the overall effectiveness of learning process (Sedova et al., 2021). Another barrier is the lack of teacher training in facilitating effective discussion practices. Therefore, classroom discussion can create intellectual environment in which higher-order cognitive processes are continuously activated & strengthened. Recent researches suggested that many instructors are not adequately prepared to design and manage dialogic learning environments (Veen et al., 2022). Effective discussion requires skills such as prompting, scaffolding, as well as managing diverse viewpoints, which are often underdeveloped among the educators.

Classroom Discussion Practices & Development of HOT

A growing body of recent research have provided strong evidence for a positive relationship between classroom discussion practices and the development of higher-order thinking skills among university students. Thus, classroom discussions practices create opportunities for active cognitive engagement, allowing students to study information, evaluate arguments, and construct knowledge collaboratively (Knight et al., 2023). These processes are fundamental to the development of HOTS, as they require learners to go beyond surface-level understanding. Empirical studies demonstrated that students who regularly participate in structured discussions exhibit higher levels of critical thinking and problem-solving skills compared to those in traditional lecture-based settings (Ernst & Colthorpe, K, 2022). Discussion-based learning encourages students to justify their reasoning and engage in evidence-based argumentation, which enhances analytical thinking. Furthermore, dialogic teaching practices have been shown to significantly improve students' ability to synthesize information and generate novel ideas, key components of the higher-order thinking (Reznitskaya & Gregory, 2021).

Through collaborative discourse, students build upon each other's ideas, leading towards deeper understanding and intellectual growth. Classroom discussion also fosters reflective thinking, which is essential for metacognitive development. When students reflect on their contributions and those of others, they develop a deeper awareness of their cognitive processes (Dawson et al., 2021). This reflective engagement strengthens their ability to regulate learning and apply knowledge in new contexts but may contribute relatively little to higher-order thinking. In the course of discussions, students must evaluate ideas by discovering key points, distinguishing between claims & evidence, and considering the applicability of supporting points (Park & Lee, 2022). Equally, Fung et al. (2022) have discovered that the teachers who pose higher-order questions aimed at differentiating and organizing receive more and better-quality responses related to analytical responses. Besides, technology-enhanced discussions, as online forums and collaborative platforms, have been found to further support HOTS development by providing extended opportunities for interaction & reflection (Cheng et al., 2023).

RESEARCH METHODOLOGY

In present study, a quantitative research approach was adopted, using descriptive research design to systematically examine selected variables. A descriptive research design was used to describe

and analyze characteristics and responses of target population. In addition, correlational research design was employed to analyze nature of relationship among the identified variables. A stratified random sampling design was used to select sample from target population for descriptive & relative analysis. The stratified random sampling is probability sampling technique in which researcher divide population into subgroups (strata) according to shared characteristics, then participations are randomly selected from each subgroup for ensuring meaningful representation in final sample (Simkus,2023).

The researcher divided the population of the current study into groups based on gender, university type, level of study, Faculty, and CGPA. Participation was randomly selected from each stratum (group) to ensure the sufficient representation of all subgroups in the sample. Given the practical limitations and context of study, stratified sampling was considered suitable. It aligned well with the research setting, allowed efficient data collection, and supported meaningful analysis of the relationship between variables of study. The target population of study consisted of undergraduate and graduate students enrolled in two universities in Lahore, one public and one private. The total population of the public university was 54,000 students, whereas private university population was proximately 25,000, included all undergraduate and graduate students. From this total population, 400 students were selected including 200 students from each university as a sample for final data collection in study.

Table 2 Reliability of Study

No. of items	Cronbach's Alpha
40	0.872

The data of study was collected through cross-sectional research design from population. The study involved 400 university students from one public, one private universities in Lahore. The researcher performed both descriptive and inferential statistics to analyze data after data collection. Means and standard deviations were used as descriptive statistics to show the level of scores of classroom discussion practices, and development of higher-order thinking skills. Analysis was done in terms of means and standard deviations of all factors. The correlation amid classroom discussion practices and development of higher-order thinking skills in university students was determined by Pearson correlation (Pearson r). Descriptive statistics was also used to analyze frequency and percentage of overall demographics.

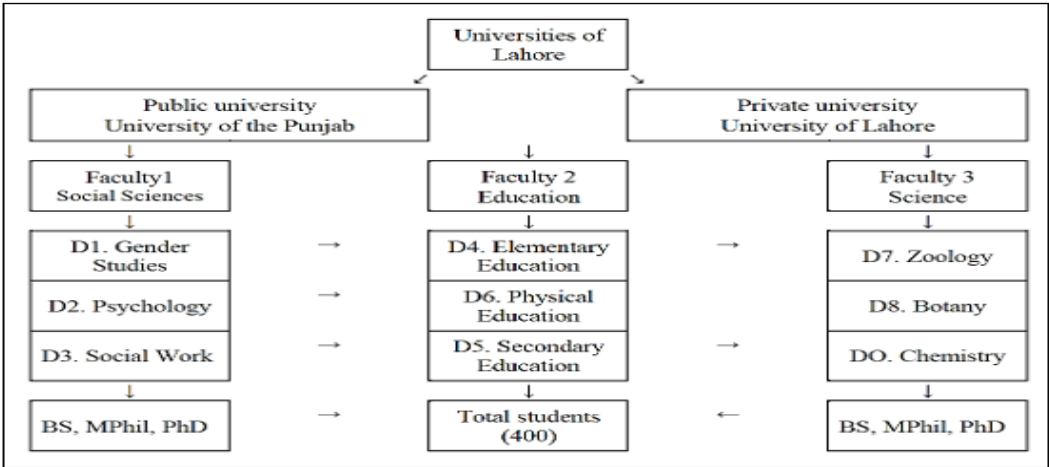
Table 3 Population of Study

University Type	Universities	Total Population
Public	1	200
Private	1	200
Total	2	400 (M & F)

The sample of the study was selected by Kerjice & Morjon sample size determined table (1970). The sample size for total 50,000 population is 357. Due to time constraints, total 400 sample was selected from two selected public and private universities. A stratified random sampling technique was used

to divide the population into strata. The sample included both male and female to ensure gender representation across the selected universities. This pattern ensured proportion representation from both public and private universities while maintaining the feasibility within the selected as well as available timeframe.

Figure 1 Flowchart of Sample of Study



The researcher developed structured questionnaire comprising of 40 items. To ensure its reliability, a pilot test was conducted prior to main study. This step helped the researcher to identify any issue in research instrument and ensured that it was accurate & reliable for use in actual data collection. The reliability of study was 0.872 as shown in given table. Cronbach Alpha was used to evaluate the reliability of study.

RESULTS OF STUDY

Alem (2020) stated that data analysis is the procedure of systematically implementing statistical and logical methods to characterize and analyze data. All statistical analysis and test details is given in this chapter. Thus, the correlation coefficients result of the correlation between the selected variables is also shown. The data of all dimensions of each variable were evaluated as the means, standard deviations, which are presented in the tables form. The multiple regression results are also given in study.

Objective 1: To identify the classroom discussion practices used by the teachers at university level
Research Question 1: What classroom discussion practices are used by teachers at university level?

Table 4 Overall Descriptive Analysis of Classroom Discussion Practices

Variable	N	Mean	SD
Classroom Discussion Practices	400	3.84	.465

Table shows mean score of overall classroom discussion practices among university students. Result showed Mean score (M = 3.84) suggesting the high level of classroom practices among university

students. Whereas, standard deviation score ($SD = .465$) is low that shows consistent responses across university students.

Table 5 Item wise Descriptive Analysis of Teacher Guidance and Facilitation

SN	Statements.	N	Mean	SD
1	My teacher asks questions that deepens discussion.	400	3.93	1.032
2	My teacher encourages students to participate in discussion.	400	3.87	.958
3	My teacher ensures most of the students get a chance to speak.	400	3.85	1.015
4	My teacher appreciates students' viewpoints during discussion.	400	3.84	.990
5	My teacher adds useful information as discussion goes on.	400	3.74	1.037
6	My teacher gives feedback mostly during discussion.	400	3.72	1.021
7	My teacher summarizes the main ideas after discussion.	400	3.84	.999

Table shows mean and standard deviation of teacher guidance and facilitation during classroom discussion. The results showed that students generally perceive their teacher's discussion practices positively, with mean scores ranging from (3.72 to 3.93) and standard deviation ranging from (.958 to 1.032). The highest-rated item is My teacher asks questions that deepens discussion ($M = 3.93$; $SD = 1.032$), while lowest is My teacher gives feedback mostly during discussion ($M = 3.72$; $SD = 1.021$). Overall, results suggested that the teacher encourages participation, values students' viewpoints, ensures student participation, and supports meaningful discussion over questioning, feedback, and summarizes main ideas.

Table 6 Item wise Descriptive Analysis of Students' Participation in Classroom Discussions

SN	Statements	N	Mean	SD
8	I actively participate in discussion.	400	3.93	1.047
9	I feel confident sharing my ideas during discussion.	400	3.84	.984
10	I feel encouraged to speak freely during discussion.	400	3.85	.933
11	I answer questions in class when asked.	400	3.76	1.005
12	I am motivated to express my thoughts during discussion.	400	3.77	1.075
13	I share my ideas clearly during discussion.	400	3.73	1.072
14	I stay active in group tasks.	400	3.80	1.116

Table presents the mean and standard deviation of students' participation in classroom discussion. The results showed that students generally demonstrate a high level of participation in classroom discussions, with mean scores ranging from (3.73 to 3.93) and standard deviations ranging from (.933 to 1.116). Among all items, the highest mean is for I actively participate in discussion ($M = 3.93$, $SD = 1.047$), indicating strong engagement, while the lowest is for I share my ideas clearly during discussion ($M = 3.73$, $SD = 1.072$).

Table 7 Item wise Descriptive Analysis of peer Interaction during Discussion

SN	Statements	N	Mean	SD
15	I learn from my classmates during discussion.	400	3.89	1.112
16	Discussion with peers helps me understand points better.	400	3.89	.924
17	My self-confidence increases through group discussion.	400	3.86	.943

18	I feel comfortable discussing ideas with classmates.	400	3.86	1.013
19	I interact respectfully with my classmates during discussion.	400	3.92	.961
20	Interaction with peers makes discussion more interesting.	400	3.83	.978
21	Peer discussion helps me see different viewpoints.	400	3.97	.923
22	I enjoy sharing my ideas with peers during discussion.	400	3.89	.964

Table shows the mean and the standard deviation of peer interaction of students in the discussion. The results indicated that students generally view peer interaction during discussions positively, with mean scores ($M = 3.83$ – 3.97) and standard deviations ($SD = 0.923$ – 1.112). Of all items, peer discussion helps me see different viewpoints ($M = 3.97$; $SD = .923$) has the highest score. This was preceded by I interact respectfully with my classmates during the discussion ($M = 3.92$; $SD = 0.961$). While the lowest is for Interaction with the peers makes discussion more interesting ($M = 3.83$, $SD = 0.978$), meaning that there was moderate range of responses as well as positive perceptions of the peer interaction.

Research objective 2: To examine level of higher order thinking skills among university students.
Research Question 2: What is level of Higher Order Thinking Skills among university students?

Table 8 Overall Descriptive Statistical Analysis of level of HOTS among University Students

Variable	N	Mean	SD	Level
Higher-order Thinking Skills (HOTS)	40	3.86	.472	High

Table shows that university students demonstrate a high level of HOTS during classroom discussion ($M = 3.86$, $SD = .472$). The finding showed high level of HOTS as; mean score is amid 3.67–5.00 range on Likert scale.

Table 9 Item wise Descriptive analysis of HOTS

SN	Statements	N	Mean	SD
23	Discussion helps me break complex ideas into parts.	400	4.02	9.42
24	Discussion helps me see a problem from different perspectives.	400	3.84	.972
25	I check differences and similarities in ideas.	400	3.83	.971
26	Discussion helps me organize ideas.	400	3.89	.910
27	Discussion helps me organize ideas.	400	3.92	.922
28	I justify my viewpoints confidently during discussion.	400	3.90	.956
29	I explain why I agree or disagree with others.	400	3.84	.902
30	I see which idea is more authentic.	400	3.83	1.048
31	I defend my opinion with reason.	400	4.11	.998
32	I judge if an example really supports an idea.	400	3.85	.927
33	I check If my example Is correct before sharing.	400	3.83	.957
34	I point out problems in an argument during discussion.	400	3.78	.980
35	I suggest new solutions to problems during discussion.	400	3.85	1.039
36	I enjoy exploring new ideas in discussion.	400	3.77	.992
37	I propose unique and creative ideas during discussion.	400	3.77	.977
38	I develop my own explanation to respond during discussion	400	3.88	.926

39	I generate my own method to understand difficult topics.	400	3.86	.983
40	Discussion helps plan ways of presenting information in class.	400	3.90	.985

Table shows mean and standard deviation of students' HOTS during classroom discussions. The results indicated that students' responses vary across items, with mean scores ranging from (3.77 to 4.11) and standard deviations from (.902 to 1.048). The highest mean is for I defend my opinion with reason ($M = 4.11$; $SD = 0.998$), while lowest means are for, I enjoy exploring new ideas in discussion ($M = 3.77$; $SD = 0.992$) and I propose unique and creative ideas during discussion ($M = 3.77$; $SD = 0.977$). Thus, findings suggested that classroom discussion helps university students in breaking complex ideas into parts, justifying viewpoints, evaluating arguments & developing critical and creative thinking skills among them.

Objective 3: To determine relationship between classroom discussion practices and development of higher-order thinking skills among university students.

Research Question 3: What is relationship amid classroom discussion practices and development of higher-order thinking skills among university students?

H01: There is no significance relationship between classroom discussion practices and development of higher-order thinking skills among university students.

Table 10 Relationship between Classroom Discussion Practices and the development of HOTS

	Classroom Discussion Practices	Higher-order Thinking Skills
Classroom Discussion Practices	1	.598**
Higher-order Thinking Skills	.598**	1
Sig. (2 tailed)	.000	.000

Correlation is significant at 0.01 level (2 tailed). $N = 400$.

Table shows result of Pearson correlation, revealing moderate positive relationship amid classroom discussion practices and the development of higher-order thinking skills among university students ($r = .598$, $p < 0.01$), confirm positive relationship between these variables, therefore, null hypothesis (H03) is rejected.

CONCLUSION

This study has investigated the association between two selected variables. The results indicated a moderate relationship amid these two variables, demonstrating that classroom discussion practices, e.g., structured & unstructured discussion practices significantly contribute to the students' cognitive development. Further types like online/hybrid discussion and post-discussion are also elaborated shortly as the entire higher education system shifted traditional educational setting to advanced setting for realizing the desired outcomes. Universities have recognized online educational patterns such as the online student-teacher interaction, discussions among students and other interactive activities that keep students engage led them to attain advanced cognition as well as classroom objectives. In this linking, the results of study suggested that classrooms characterized by active student participation, interactive dialogue, open-ended questioning, as well as opportunities for

reasoned argumentation foster deeper cognitive engagement compared towards teacher-centered instructional approaches.

Recommendations

1. Instructions methods may include lecture-based teaching; however, the use of structured or unstructured discussions e.g., peer interaction, small group discussions can be more beneficial in term of development students' rational, logical and analysis abilities.
2. Based on the findings of this study, peer interaction during classroom discussion be fortified as peer interaction serves as cognitive scaffold, permits students to sharpen their knowledge by means of negotiating meaning.
3. Universities should integrate technology-enhanced discussion platform during online classes like Google Classroom, Zoom & virtual collaborative, interactive response system to enhance student engagement beyond traditional classroom discussion settings.

REFERENCES

- Alem, D. D. (2020). An overview of data analysis and interpretations in research. *International Journal of Academic Research in Education & Review*, 8(1), 1–27. <https://doi.org/10.14662/IJARER2020.015>.
- Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. Longman.
- Bahtiyar, A., & Can, B. (2021). The views of Science and Art Center (SAC) students regarding Socratic inquiry seminars. *Eğitimde Nitel Araştırmalar Dergisi*, 21(28), 1–21. <https://doi.org/10.14689/enad.28.1>.
- Coker, D. (2022). Transforming asynchronous online discussions with a structured conversation system. *Journal of Studies in Education*, 12(4).
- Columbia Center for Teaching and Learning (2021). The Learning Through. Discussion. Columbia University. <https://ctl.columbia.edu/resources-and-technology/resources/learning-over-discussion/>.
- Cui, R., & Teo, P. (2023). Thinking through talk: Using dialogue to develop students' critical thinking. *Teaching and Teacher Education*, 125, 104068. <https://doi.org/10.1016/j.tate.2023.104068>.
- Dawson, P. (2021). Metacognition and reflective learning in higher education. *Higher Education Research & Development*, 40 (6), 1232–1246.
- Gupta, T., & Mishra, L. (2021). Higher-Order Thinking Skills in Shaping the Future of Students. *Psychology and Education*, 58 (2), 9305–9311.
- Hattie, J., & Clarke, S. (2023). Visible learning: Feedback. Routledge. <https://doi.org/10.4324/9780429485480>.
- Higgins, M. C. M., Taylor, A. H., Rocco, S. A., & Kimel, R. A. (2022). Student engagement strategies during the COVID-19 pandemic. *Springer*.
- Huang, X., Li, Y., Zhang, L., Wang, J., & Chen, S. (2022). Collaborative learning and critical thinking. *Thinking Skills and Creativity*, 44, Article 101019. <https://doi.org/10.1016/j.tsc.2022.101019>.

- Homayouni, M. (2022). Peer assessment in group-oriented classroom contexts: Effects of scaffolding and peer interaction on speaking and vocabulary learning. *Language Testing in Asia*, 12(61). <https://doi.org/10.1186/s40468-022-00211-3>.
- Klein, M, & Majdoubi, N. (2024). The medium is the message: toxicity declines in structured vs unstructured online deliberations. The World Wide Web. <https://doi.org/10.1007/s11280-024-01269-0>.
- Leese, B, & Rosen, A. M. (2025). Increasing inclusion in classroom discussion: The raised block as a classroom response system in international studies. *International Studies Perspectives*, 26(2), 125–144. <https://doi.org/10.1093/isp/ekae004>.
- Lu, O. H. T., Huang, Q., & Yang, S. J. H. (2021). Examining key factors affecting College students' HOTS. *International Journal of Educational Technology in Higher Education*, 18, 1.
- Liu, D., & Zhang, H. (2022). Improving students' higher order thinking skills and achievement using WeChat-based flipped classroom in the higher education. *Education and Information Technologies*, 27, 7281–7302. <https://doi.org/10.1007/s10639-022-10922-y>.
- Liu, H., & Gillies, R. M. (2021). Teacher questioning as mediated learning behavior in classroom interaction. *Frontiers in Education*, 6, 674876.
- Lukashe, M., Chigbu, B. I., & Umejesi, I. (2024). Synchronous online learning and student engagement. *Frontiers in Education*.
- Mercer, N., & Howe, D. C. (2023). Explaining the dialogic processes of teaching and learning. *International Journal of Educational Research*, 117, 102–113. <https://doi.org/10.1016/j.ijer.2023.102113>.
- OECD (2025), *Unlocking High-Quality Teaching*, OECD Publishing, Paris, <https://doi.org/10.1787/5b82176-en>.
- OECD. (2021). *21st century readers: Developing literacy skills in a digital world*. OECD Publishing. <https://doi.org/10.1787/a83d84cb-en>.
- Pujiastuti, H., & Haryadi, R. (2022). Higher-order thinking skills profile of Islamic boarding school students on geometry through STEM-based video approach. *Journal of Physics: Conference Series*, 2331(1), 012012.
- Rahmat, H., & Jon, R. B. (2023). Benefits and challenges of group discussion as creative learning strategies in speaking class. *International Journal of Education & Curriculum Application*, 6(1). <http://journal.ummat.ac.id/index.php/IJECA>.
- Rivera, R., Smart, J., Sakaria, S., & Wray, A. (2021). Engaging synchronous online instruction during COVID-19. *JMIR Medical Education*. 24 (2), 305–317.
- Samadi, F., Jafarigohar, M., Saeedi, M., Ganji, M., & Khodabandeh, F. (2024). Impact of flipped classroom on EFL learners' self-regulated learning and higher-order thinking skills during the Covid-19 pandemic. *Asian-Pacific Journal of Second and Foreign Language Education*, 9, 24. <https://doi.org/10.1186/s40862-023-00246-w>.
- Sedova, K., Sedlacek, M., & Svaricek, R. (2022). Dialogic teaching and student participation in classroom discourse. *Teaching and Teacher Education*, 110.
- Singh, C. K. S. (2020). A review of research on the importance of higher order thinking skills (HOTS) in teaching English language. *Journal of Critical Reviews*, 7(8), 161. <https://doi.org/10.31838/jcr.07.08.161>.

- Utami, A. D., Susiswo, Darmawan, P., Rofiki, I., Osman, S., Putri, O. R. U., Putri, R. A., & Damayanti, H. (2025). Fostering higher-order thinking skills through discussion-centric blended learning. **Mathematics Teaching Research Journal*, 17*(2), 255–274. <https://files.eric.ed.gov/fulltext/EJ1474428.pdf>.
- UNESCO. (2023). Global education monitoring report 2023: Technology in education. UNESCO. <https://www.unesco.org/gem-report/en/technology>.
- Wang, et al. (2024). K-12 students' higher-order thinking skills: Conceptualization, components, and evaluation indicators. *Thinking Skills and Creativity*, 52, 101551.
- Waqar, Z., Sultana, S., & Ata, M. (2025). In-class active engagement strategies to enhance student participation during lectures: A systematic review. *Journal of Bahria University Medical and Dental College*, 15(2), 146–158.
- Yan, Y., Vyas, L., Wu, A. M., & Rawat, S. (2022). Effective online education under COVID-19: Perspectives from teachers and students. *Journal of Educational Technology Systems*. <https://doi.org/10.1080/15236803.2022.2110749>.
- Yanti, F. A., & Thohir, M. A. (2024). Higher order thinking skills in science learning: A systematic review from 2014–2023. *International Journal of Evaluation and Research in Education*, 13(4).
- Yee, M., et al. (2023). AI-assisted analysis of content, structure, and sentiment in MOOC discussion forums. *Frontiers in Education*. <https://doi.org/10.3389/educ.2023.1250846>.
- Yildirim, O., & Simsek, U. D. (2024). Cultural moderators of the discussion–critical thinking relationship in university classrooms: A cross-cultural comparative study. *Higher Education*, 87(2), 459–478. <https://doi.org/10.1007/s10734-023-01027-x>.
- Zainuddin, Z., Perera, C. J., Haruna, H., & Habiburrahim, H. (2022). The Think-pair-share and collaborative discussion: Comparing HOTS outcomes in Malaysian university classrooms. *Active Learning in Higher Education*, 23(1), 49–65. <https://doi.org/10.1177/1469787420912463>.