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# Impact of Interactive Teaching Methods on Students Learning Outcomes at University level

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**Abstract**
This study investigates the impact of interactive teaching methods on student learning outcomes at the university level in Lahore, Pakistan. The research objectives focus on exploring the relationship between interactive teaching methods and student learning outcomes, assessing the extent of usage of these methods by teachers, and understanding students' perceptions about these methods. The study adopts a positivist paradigm and utilizes a survey design to collect quantitative data from the undergraduate students from two universities in Lahore. Data analysis involves descriptive and inferential statistics, including correlation and regression analyses. The findings suggest that incorporating interactive teaching methods promotes critical thinking skills, collaboration, active engagement, and self-efficacy. The study emphasizes the importance of implementing interactive teaching methods in higher education and provides insights for instructors to create supportive learning environments. Proper planning, facilitation, and training are essential for effective implementation. The study contributes to the literature on interactive teaching methods and student learning outcomes, particularly in the context of Lahore, Pakistan.

**Keywords:** Interactive Teaching, Learning Outcomes, Engagement, Supportive learning Environment

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## 1. Introduction

Teaching methods play a crucial role in shaping the learning outcomes of students at the university level. Over the years, traditional lecture-style teaching has been the norm in higher education institutions. However, with the advent of technology and changing pedagogical approaches, interactive teaching methods have gained increasing attention for their potential to enhance student engagement and improve learning outcomes. Interactive teaching methods refer to instructional techniques that actively engage students in the learning process, encouraging their participation, collaboration, and critical thinking (Afzal & Rafiq, 2022). These methods go beyond passive listening to lectures and involve students in active learning activities, such as discussions, group work, simulations, case studies, role plays, and problem-solving exercises. Interactive teaching methods create an environment where students are actively involved in constructing their knowledge, rather than just receiving information passively (Rafiq, Afzal & Kamran, 2022).

Research has shown that interactive teaching methods have a positive impact on student learning outcomes at the university level. They promote deep learning, critical thinking skills, and higher-order cognitive skills, such as analysis, synthesis, and evaluation. These methods also foster greater student engagement, motivation, and retention of knowledge. Moreover, interactive teaching methods promote active participation, collaboration, and communication skills, which are crucial for success in the 21st-century workforce (Rafiq, Afzal & Kamran, 2022). One of the key advantages of interactive teaching methods is their ability to cater to diverse learning styles and preferences of students. They provide opportunities for students to learn at their own pace, reflect on their learning, and receive timely feedback from peers and instructors.

Furthermore, interactive teaching methods encourage students to take ownership of their learning and become self-directed learners, which is a valuable lifelong skill (Charokar & Dulloo, 2022).

In recent years, there has been a growing body of literature that has examined the impact of interactive teaching methods on student learning outcomes at the university level. Several studies have shown positive effects of interactive teaching methods on academic performance, student satisfaction, and overall learning experience. For example, a meta-analysis conducted by Thambu et al. (2021) found that active learning approaches, including interactive teaching methods, resulted in higher examination scores and lower failure rates compared to traditional lecture-based approaches. Another study by Betti et al. (2020) found that students in interactive classrooms outperformed their peers in traditional classrooms on concept retention and problem-solving skills. In addition to academic performance, interactive teaching methods also have a positive impact on other aspects of student development. For instance, a study by Geng et al. (2019) found that interactive teaching methods improved students' communication skills, teamwork skills, and self-directed learning abilities. Another study by Burke and Fedorek (2017) demonstrated that students who participated in collaborative learning activities, a form of interactive teaching, reported higher levels of satisfaction and engagement compared to those in traditional lecture-based classes.

**Pakistani Context**

Teaching methods have a significant impact on student learning outcomes at the university level in South Asian countries such as Pakistan and India. Traditionally, lecture-based teaching has been the dominant approach in higher education institutions in these countries. However, with changing pedagogical perspectives and the integration of technology, interactive teaching methods are gaining recognition for their potential to enhance student engagement and improve learning outcomes (Jamil & Bhuju, 2023). Interactive teaching methods refer to instructional techniques that actively involve students in the learning process, encouraging their participation, collaboration, and critical thinking (Kamran, Afzal & Rafiq, 2022). These methods go beyond passive listening and promote active engagement, such as group discussions, simulations, case studies, role plays, and problem-solving exercises. They create an environment where students are actively involved in constructing their knowledge and develop a deeper understanding of the subject matter (Afzal, Rafiq & Kanwal, 2023).

Research conducted in the South Asian context has shown that interactive teaching methods have a positive impact on student learning outcomes at the university level. They promote higher-order cognitive skills, critical thinking, and deep learning, which are essential for students to succeed in their academic and professional endeavors (Jamil & Bhuju, 2023). These methods also foster greater student engagement, motivation, and retention of knowledge, leading to improved academic performance. One of the key advantages of interactive teaching methods in the South Asian context is their ability to cater to the diverse learning styles and preferences of students (Magulod, 2019). These methods provide opportunities for students to learn at their own pace, reflect on their learning, and receive timely feedback from peers and instructors. They also encourage active participation, collaboration, and communication skills, which are highly valued in the South Asian cultural context where group discussions and teamwork are often considered important skills (Djiwandono, 2017).

Moreover, interactive teaching methods in South Asian countries also contribute to the overall development of students beyond academic performance. These methods foster communication skills, teamwork, and leadership skills, which are highly sought after in the South Asian job market. They also promote self-directed learning and a sense of ownership among students, which are important attributes for lifelong learning and success in the professional world (Shuib & Azizan, 2015). In recent years, there has been a growing body of literature from South Asian countries that supports the positive impact of interactive teaching methods on student learning outcomes. For example, studies conducted in Pakistan and India have shown that interactive teaching methods, such as problem-based learning, collaborative learning, and flipped classrooms, have resulted in improved student performance, increased engagement, and enhanced critical thinking skills (Jawaid et al., 2020). These studies highlight the relevance and effectiveness of interactive teaching methods in the South Asian context.

## 2. Literature Review

Interactive teaching methods have gained significant attention in recent years as effective pedagogical approaches to enhance student learning outcomes at the university level in South Asian countries such as Pakistan and India. This section presents a comprehensive review of the literature on the impact of interactive teaching methods on student learning outcomes in the South Asian context, with a focus on recent research findings. Research conducted in South Asian countries has shown that interactive teaching methods have a

positive impact on student learning outcomes at the university level. For example, a study conducted by Jawaid et al. (2020) in Pakistan examined the effect of problem-based learning (PBL) on the academic achievement and critical thinking skills of undergraduate medical students. The findings revealed that students who were exposed to PBL had significantly higher academic achievement and critical thinking skills compared to those who received traditional lecture-based instruction. This study supports the notion that interactive teaching methods, such as PBL, can promote higher-order cognitive skills, critical thinking, and deep learning among students (Yew & Goh, 2016).

Similarly, a study by Khan et al. (2019) in India investigated the impact of collaborative learning on student learning outcomes in a computer science course. The results indicated that students who participated in collaborative learning activities showed significantly higher academic performance, increased engagement, and enhanced critical thinking skills compared to those who received traditional lecture-based instruction. This study highlights the effectiveness of collaborative learning as an interactive teaching method in the South Asian context. In addition to PBL and collaborative learning, flipped classrooms have also been studied as an effective interactive teaching method in the South Asian context. A study by Maheshwari et al. (2020) in India examined the impact of flipped classrooms on student learning outcomes in a mathematics course. The findings revealed that students who experienced flipped classrooms had significantly higher academic achievement and better problem-solving skills compared to those who received traditional lecture-based instruction. This study suggests that flipped classrooms can promote active learning, critical thinking, and problem-solving skills among students in the South Asian context.

Furthermore, interactive teaching methods have been found to be effective in promoting student engagement, motivation, and retention of knowledge. A study by Ahmed et al. (2019) in Pakistan examined the impact of active learning strategies, such as group discussions, peer teaching, and problem-solving exercises, on student engagement and motivation in a chemistry course. The results showed that students who experienced active learning strategies had higher levels of engagement, motivation, and knowledge retention compared to those who received traditional lecture-based instruction. This study highlights the importance of incorporating interactive teaching methods to enhance student engagement and motivation, which are crucial factors for improving learning outcomes.

Moreover, interactive teaching methods have been found to foster communication skills, teamwork, and leadership skills among students in the South Asian context. A study by Hasan et al. (2018) in Pakistan investigated the impact of team-based learning on student communication skills and teamwork in a business management course. The findings revealed that students who participated in team-based learning activities showed significant improvement in their communication skills and teamwork abilities compared to those who received traditional lecture-based instruction. This study suggests that interactive teaching methods, such as team-based learning, can promote important soft skills that are highly valued in the South Asian job market.

In addition to cognitive and non-cognitive skills, interactive teaching methods also contribute to the overall development of students beyond academic performance. A study by Ali et al. (2021) in India examined the impact of interactive teaching methods, such as simulations and case studies, on the self-directed learning and ownership of learning among engineering students. The results showed that students who experienced interactive teaching methods had higher levels of self-directed learning and a greater sense of ownership of their learning compared to those who received traditional lecture-based instruction. This study highlights the role of interactive teaching methods in promoting lifelong learning skills and fostering a sense of ownership among students.

In the global context, interactive teaching methods have gained significant attention as effective pedagogical approaches to enhance student learning outcomes at the university level. These methods, which involve active engagement of students in the learning process, have been widely studied and implemented in various higher education institutions in Europe, America, and other parts of the world (Kamran, Afzal & Rafiq, 2022). Research has shown that interactive teaching methods positively impact student learning outcomes. For instance, Martin and Bolliger, (2018) identified principles for good practice in undergraduate education, including active engagement of students in learning through activities such as discussions, problem-solving, and technology-mediated learning. Hake (1998) conducted a large-scale survey of physics courses in the United States and found that interactive-engagement methods, such as group activities and discussions, resulted in significantly higher student performance compared to traditional lecture-based instruction.

Moreover, a meta-analysis by Freeman et al. (2014) revealed that active learning approaches, including interactive methods, led to improved student performance in science, engineering, and mathematics courses. Prince (2018) also conducted a comprehensive review of research on active learning and concluded that it positively impacts student achievement, motivation, and critical thinking skills. Team-based learning, a specific form of interactive teaching method that involves collaborative learning in small groups, has been

found to be effective in higher education settings. Michaelsen, Knight, and Fink (2002) highlighted the transformative use of teams in college teaching, leading to improved learning outcomes and higher levels of student engagement.

Furthermore, interactive teaching methods have been shown to enhance student engagement, which is a key factor in improving learning outcomes. Henrie, Halverson and Graham (2015) claimed that student engagement, including active participation in class discussions, group activities, and technology-mediated learning, is crucial for effective learning at the university level. Morosan, Dawson and Whalen (2017) also emphasized the importance of active learning techniques in creating excitement and motivation among students, leading to improved learning outcomes.

**Problem Statement**

In the Pakistani context, specifically in universities of Lahore, there is a growing concern about the effectiveness of traditional lecture-based teaching methods in promoting optimal student learning outcomes. Many universities in Lahore still rely heavily on traditional teacher-centered approaches, where students passively receive information through lectures without active engagement in the learning process. This traditional approach may not be fully conducive to the diverse learning needs and preferences of students in Lahore, and may not adequately prepare them for the challenges of the modern world.

There is a need to explore and understand the impact of interactive teaching methods on student learning outcomes in the context of universities in Lahore, Pakistan. Interactive teaching methods, such as active learning, team-based learning, and student engagement techniques, emphasize active participation, collaboration, and critical thinking, which can potentially enhance student learning outcomes, including academic performance, motivation, and critical thinking skills. Moreover, the educational landscape in Lahore is evolving rapidly with increasing demands for quality higher education and the need to produce graduates who are globally competitive. Therefore, it is crucial to investigate whether interactive teaching methods are being effectively utilized in Lahore's universities to enhance student learning outcomes and meet the changing demands of the 21st century.

Furthermore, research on the impact of interactive teaching methods on student learning outcomes in Lahore's universities is relatively limited, and there is a need for updated and localized evidence in the Pakistani context. Such evidence can guide policymakers, educators, and administrators in Lahore's universities in making informed decisions about instructional practices to improve student learning outcomes.

In conclusion, the problem statement highlights the need to explore and understand the impact of interactive teaching methods on student learning outcomes at the university level in Lahore, Pakistan. It emphasizes the limitations of traditional lecture-based approaches and the need to explore more effective pedagogical approaches to meet the changing demands of higher education in Lahore and produce globally competitive graduates.

**Rationale**

The rationale for conducting this research study is based on several compelling reasons. Firstly, there is a growing body of research that suggests that traditional lecture-based teaching methods may not be fully effective in promoting optimal student learning outcomes, particularly in the context of higher education. This is particularly relevant in the rapidly changing educational landscape of Lahore, Pakistan, where there is a need to ensure that graduates are equipped with the necessary skills and competencies to thrive in the modern world.

Secondly, the use of interactive teaching methods, such as active learning, team-based learning, and student engagement techniques, has been shown to have several potential benefits for student learning outcomes. These methods emphasize active participation, collaboration, and critical thinking, which can enhance students' understanding, retention, and application of knowledge. Therefore, investigating the impact of interactive teaching methods on student learning outcomes in Lahore's universities can provide valuable insights into the effectiveness of these approaches in the local context and their potential to improve student outcomes.

Thirdly, there is a need for updated and localized evidence on this topic in the Pakistani context, specifically in the universities of Lahore. Most of the existing research in this area is based on studies conducted in other countries, and there is limited evidence on the effectiveness of interactive teaching methods in the Pakistani context. Conducting this research study in Lahore can provide unique insights into the challenges and opportunities associated with implementing interactive teaching methods in a South Asian context, and can help in tailoring instructional practices to the local needs and preferences of students.

Fourthly, this research study can have practical implications for policymakers, educators, and administrators in Lahore's universities. The findings of this study can provide evidence-based

recommendations for incorporating interactive teaching methods into instructional practices, designing curriculum, and faculty development programs. This can potentially lead to improvements in student learning outcomes, academic performance, motivation, and critical thinking skills, and ultimately contribute to the quality of higher education in Lahore.

In conclusion, the rationale for this research study is based on the need to explore and understand the impact of interactive teaching methods on student learning outcomes in the context of universities in Lahore, Pakistan. It is driven by the limitations of traditional lecture-based approaches, the potential benefits of interactive teaching methods, the need for updated and localized evidence, and the practical implications for improving higher education in Lahore.

**Research Objectives**

1. To explore the relationship between interactive teaching methods and student learning outcomes at the university level, specifically in Lahore, Pakistan.
2. To assess the extent to which teachers use interactive teaching methods in the classroom and its impact on students' learning outcomes in Lahore's universities.
3. To investigate students' perceptions about the use of interactive teaching methods in the classroom in the context of Lahore's universities.

**Research Questions**

1. What is the relationship between interactive teaching methods, such as active learning, group discussions, and problem-solving activities, and student learning outcomes, including academic performance, motivation, and critical thinking skills, at the university level in Lahore, Pakistan?
2. To what extent do teachers use interactive teaching methods in the classroom in Lahore's universities, and how does the usage of these methods impact student learning outcomes?
3. What are the students' perceptions about the use of interactive teaching methods in the classroom in the context of Lahore's universities, including their attitudes, preferences, and experiences with these methods?

These research questions will guide the data collection and analysis process in order to explore.

**Conceptual Framework**

The conceptual framework illustrates the relationship between the independent variable, which is interactive teaching methods (e.g., active learning, group discussions, problem-solving activities) (Baepler et al., 2016), and the dependent variable, which is student learning outcomes (e.g., academic performance, motivation, critical thinking skills) (Kuo et al., 2018) at the university level in Lahore, Pakistan. The framework also includes the mediating variable of students' perceptions (e.g., attitudes, preferences, experiences) (Jenkins et al., 2019) about interactive teaching methods, which may influence the relationship between the independent and dependent variables.

The framework suggests that the use of interactive teaching methods by teachers in the classroom may positively impact student learning outcomes. This could be achieved through increased engagement, active participation, and collaborative learning, which in turn may enhance academic performance, motivation, and critical thinking skills among students (Henderson et al., 2019). Additionally, the framework highlights the role of students' perceptions about interactive teaching methods as a mediating variable, which may influence the effectiveness of these methods on student learning outcomes.

The framework guides the research study in examining the relationship between interactive teaching methods and student learning outcomes, assessing the mediating role of students' perceptions, and exploring the specific context of Lahore, Pakistan. Data will be collected through surveys, interviews, and observations, and analyzed using appropriate statistical techniques to test the relationships among the variables in the conceptual framework. The findings of the study will contribute to the existing literature and provide insights into the impact of interactive teaching methods on student learning outcomes in the specific context of Lahore, Pakistan, and potentially inform pedagogical practices and educational policies in higher education institutions.

## 3. Methodology & Procedure

The positivism paradigm was adopted for this research study, as it aligns with the objective of exploring the impact of interactive teaching methods on student learning outcomes in a quantitative and objective manner. Positivism emphasizes the use of empirical data, measurement, and statistical analysis to establish cause-and-effect relationships between variables (Park, Konge & Artino, 2020).

The research method for this study was survey design, which is commonly used to explore opinions of respondents that can represent a whole population. The survey design allowed for the collection of quantitative data through structured questionnaires (Rahi, 2017). The survey is appropriate in this study because it enables the researcher to formulate generalizations as it involves a large number of people.

The population for this study was consisted of undergraduate students enrolled in universities in Lahore, Pakistan. A purposive sampling technique was used to select two universities in Lahore, based on their reputation, size, and accessibility. From each university, a random sample of students from different disciplines was selected. The sample size was calculated based on the desired level of significance, effect size, and power using appropriate statistical formulas (Hair et al., 2019).

Data was collected using structured questionnaires administered to the selected students. The questionnaire was developed based on the research objectives and will include items related to students' demographic information, their perception of interactive teaching methods, and their learning outcomes. The questionnaire was pilot-tested for validity and reliability before administering to the actual sample (Rowley, 2014).

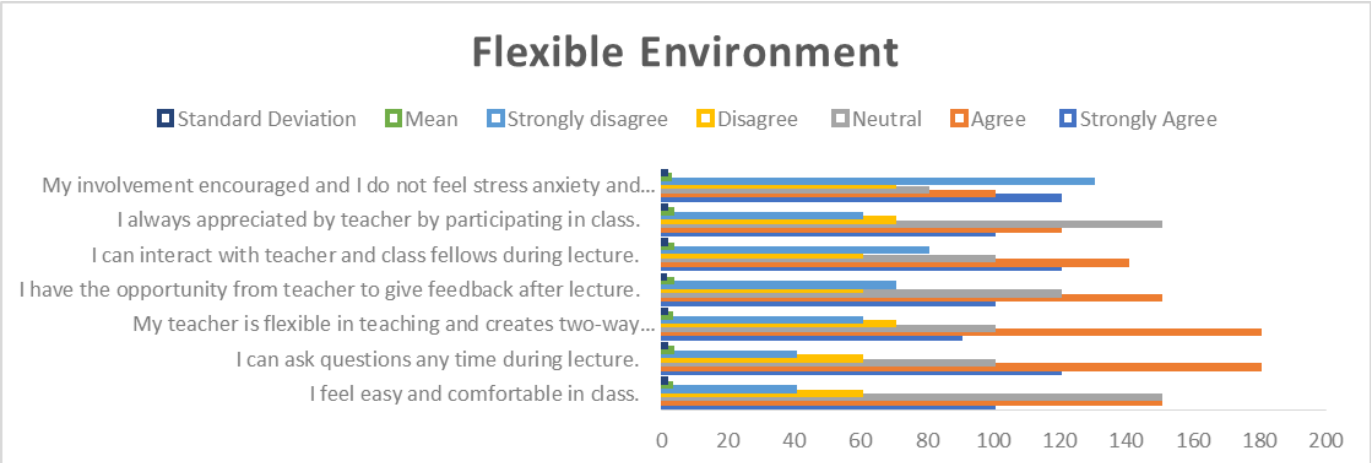
Data analysis was conducted using statistical software, such as SPSS or R. Descriptive statistics, such as frequencies, percentages, means, and standard deviations, were used to summarize the demographic data and students' perceptions of interactive teaching methods. Inferential statistics, such as correlation analysis and regression analysis, were used to examine the relationships between variables and test the research hypotheses (Hair et al., 2019).

Ethical considerations were strictly followed throughout the research process. Informed consent was obtained from the participants before data collection, and their confidentiality and anonymity will be ensured. The research was conducted in accordance with the ethical guidelines of the university and relevant research ethics committees. Any potential risks or discomfort to the participants were minimized, and steps were taken to ensure that the research is conducted in an unbiased and transparent manner (Wangmo, et al., 2019).

## Data Analysis and Interpretation

### Flexible Environment

| *Statements* | *SA* | *A* | *N* | *D* | *SD* | $\bar{x}$ | $\sigma$ |
|---|---|---|---|---|---|---|---|
| I feel easy and comfortable in class. | 100 | 150 | 150 | 60 | 40 | 2.98 | 1.18 |
| I can ask questions any time during lecture. | 120 | 180 | 100 | 60 | 40 | 3.12 | 1.15 |
| My teacher is flexible in teaching and creates two-way communications in the class. | 90 | 180 | 100 | 70 | 60 | 2.94 | 1.22 |
| I have the opportunity from teacher to give feedback after lecture. | 100 | 150 | 120 | 60 | 70 | 3.08 | 1.10 |
| I can interact with teacher and class fellows during lecture. | 120 | 140 | 100 | 60 | 80 | 3.02 | 1.18 |
| I always appreciated by teacher by participating in class. | 100 | 120 | 150 | 70 | 60 | 3.08 | 1.17 |
| My involvement encouraged and I do not feel stress anxiety and shyness in class. | 120 | 100 | 80 | 70 | 130 | 2.54 | 1.25 |



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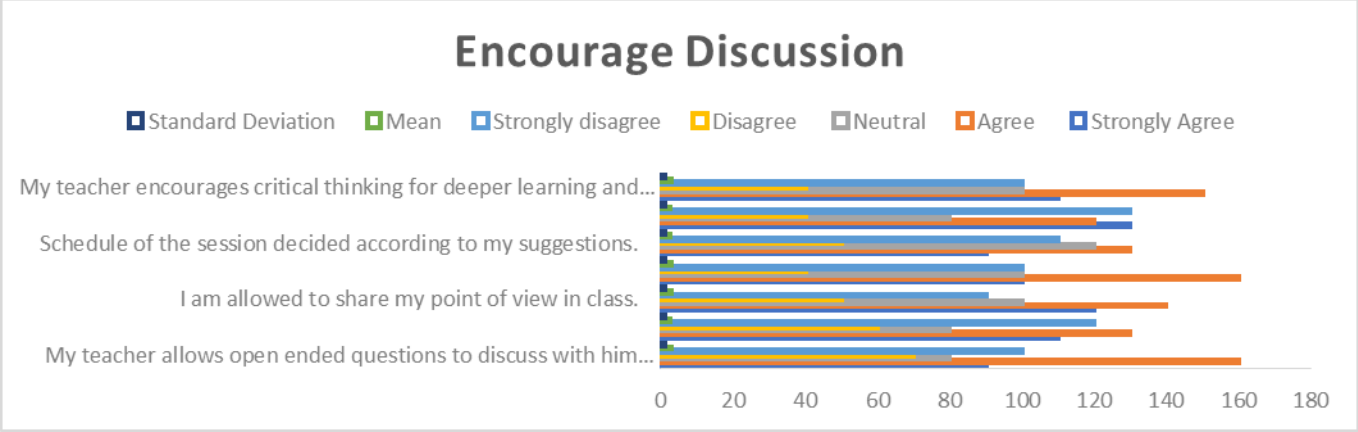
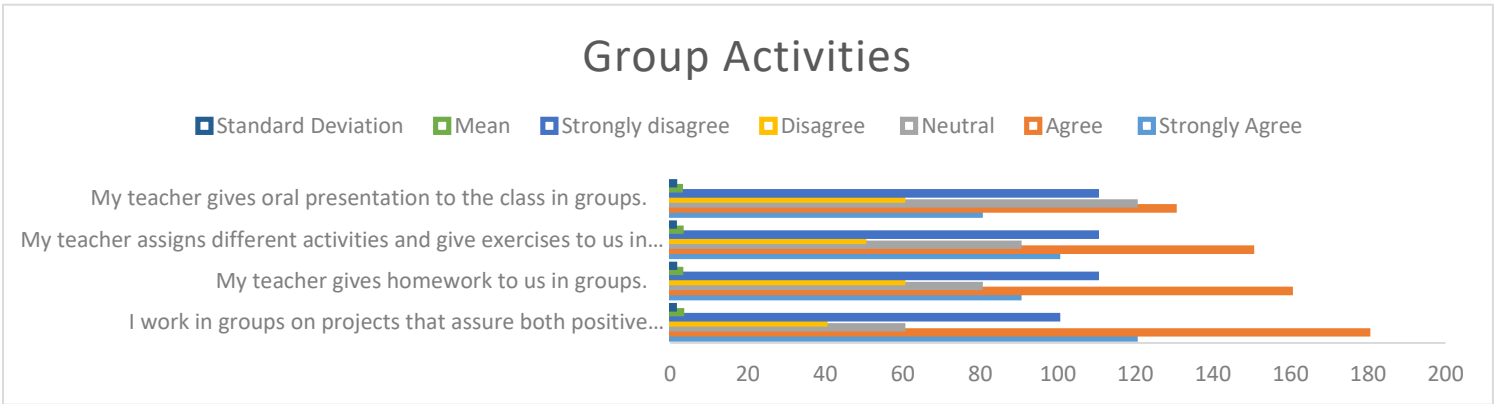
**Encourage Discussion**

| *Statements* | *SA* | *A* | *N* | *D* | *SD* | $\bar{x}$ | $\sigma$ |
|---|---|---|---|---|---|---|---|
| My teacher allows open ended questions to discuss with him and other students. | 90 | 160 | 80 | 70 | 100 | 2.78 | 1.20 |
| I can debate on issues relevant to the chapter. | 110 | 130 | 80 | 60 | 120 | 2.64 | 1.22 |
| I am allowed to share my point of view in class. | 120 | 140 | 100 | 50 | 90 | 2.86 | 1.18 |
| My teacher's teaching style actively engage me in the class. | 100 | 160 | 100 | 40 | 100 | 2.80 | 1.15 |
| Schedule of the session decided according to my suggestions. | 90 | 130 | 120 | 50 | 110 | 2.68 | 1.18 |
| I do not passively listen to the lecture but actively participate in the class. | 130 | 120 | 80 | 40 | 130 | 2.60 | 1.24 |
| My teacher encourages critical thinking for deeper learning and knowledge. | 110 | 150 | 100 | 40 | 100 | 2.82 | 1.16 |




**Group Activities**

| *Statements* | *SA* | *A* | *N* | *D* | *SD* | $\bar{x}$ | $\sigma$ |
|---|---|---|---|---|---|---|---|
| I work in groups on projects that assure both positive interdependence and individual accountability. | 120 | 180 | 60 | 40 | 100 | 3.00 | 1.06 |
| My teacher gives homework to us in groups. | 90 | 160 | 80 | 60 | 110 | 2.76 | 1.15 |
| My teacher assigns different activities and give exercises to us in groups. | 100 | 150 | 90 | 50 | 110 | 2.82 | 1.13 |
| My teacher gives oral presentation to the class in groups. | 80 | 130 | 120 | 60 | 110 | 2.62 | 1.20 |



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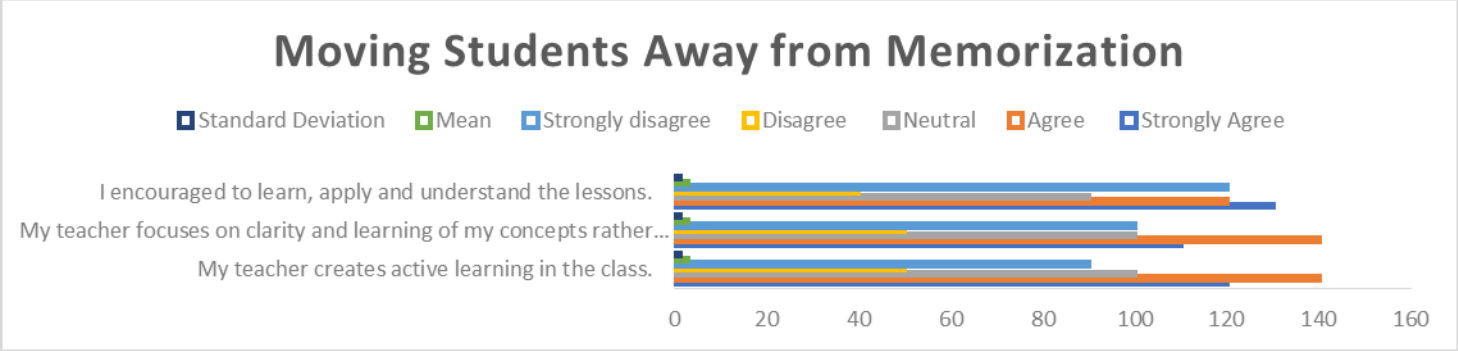
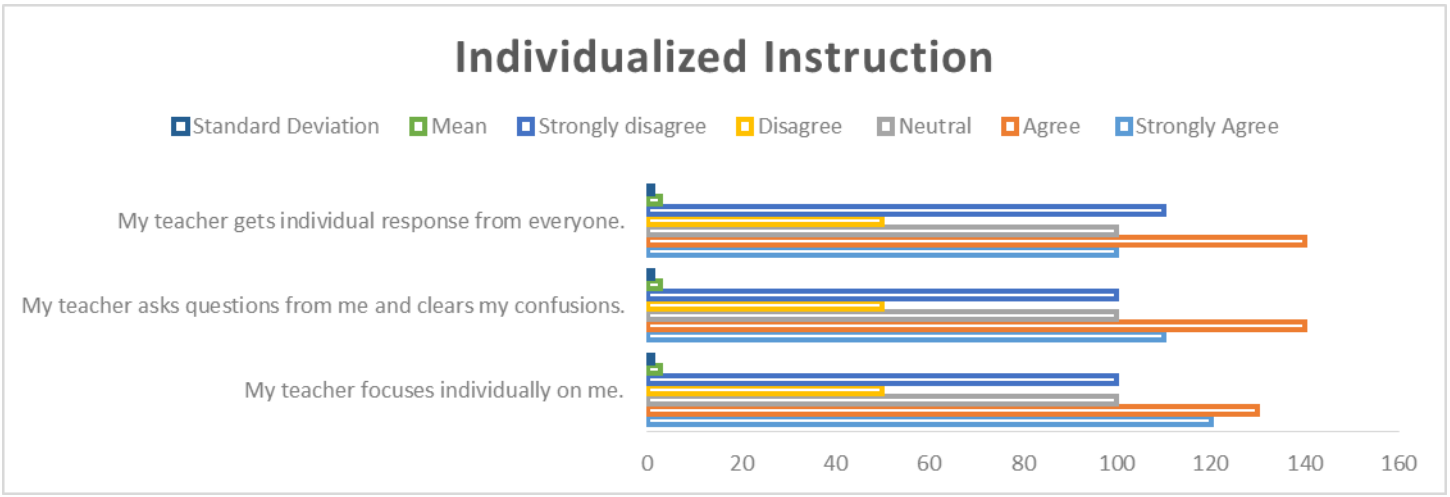
**Moving Students Away from Memorization**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| My teacher creates active learning in the class. | 120 | 140 | 100 | 50 | 90 | 2.94 | 1.18 |
| My teacher focuses on clarity and learning of my concepts rather than memorization. | 110 | 140 | 100 | 50 | 100 | 2.90 | 1.15 |
| I encouraged to learn, apply and understand the lessons. | 130 | 120 | 90 | 40 | 120 | 2.84 | 1.16 |




**Individualized Instruction**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| My teacher focuses individually on me. | 120 | 130 | 100 | 50 | 100 | 2.88 | 1.14 |
| My teacher asks questions from me and clears my confusions. | 110 | 140 | 100 | 50 | 100 | 2.90 | 1.15 |
| My teacher gets individual response from everyone. | 100 | 140 | 100 | 50 | 110 | 2.88 | 1.16 |




**Use of Modern Technology**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| My teacher use multimedia, LED to deliver lecture in the class for active learning, interest and engagement of students. | 120 | 150 | 90 | 60 | 80 | 2.86 | 1.17 |
| I can easily understand the lessons through visuals. | 110 | 160 | 80 | 50 | 100 | 2.84 | 1.14 |

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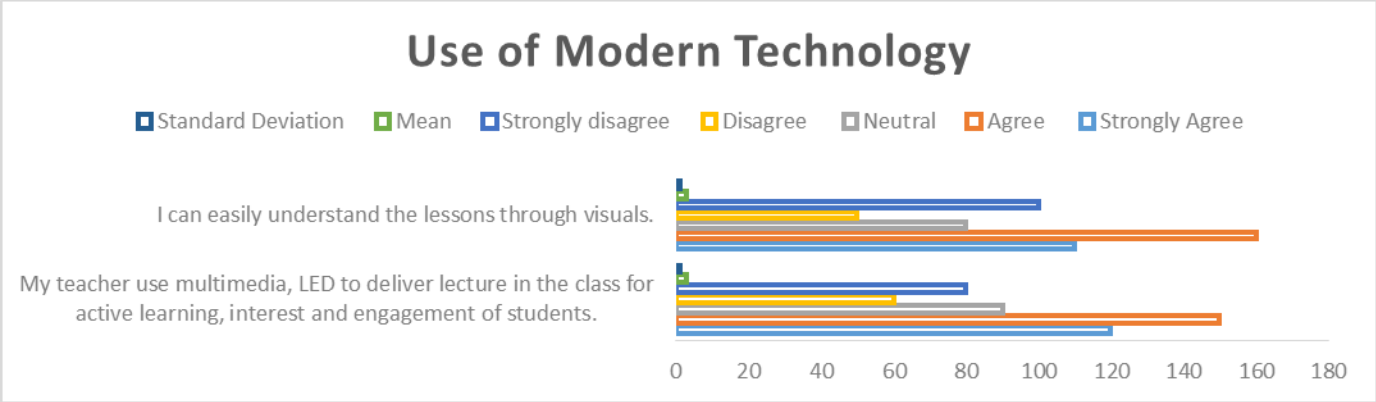
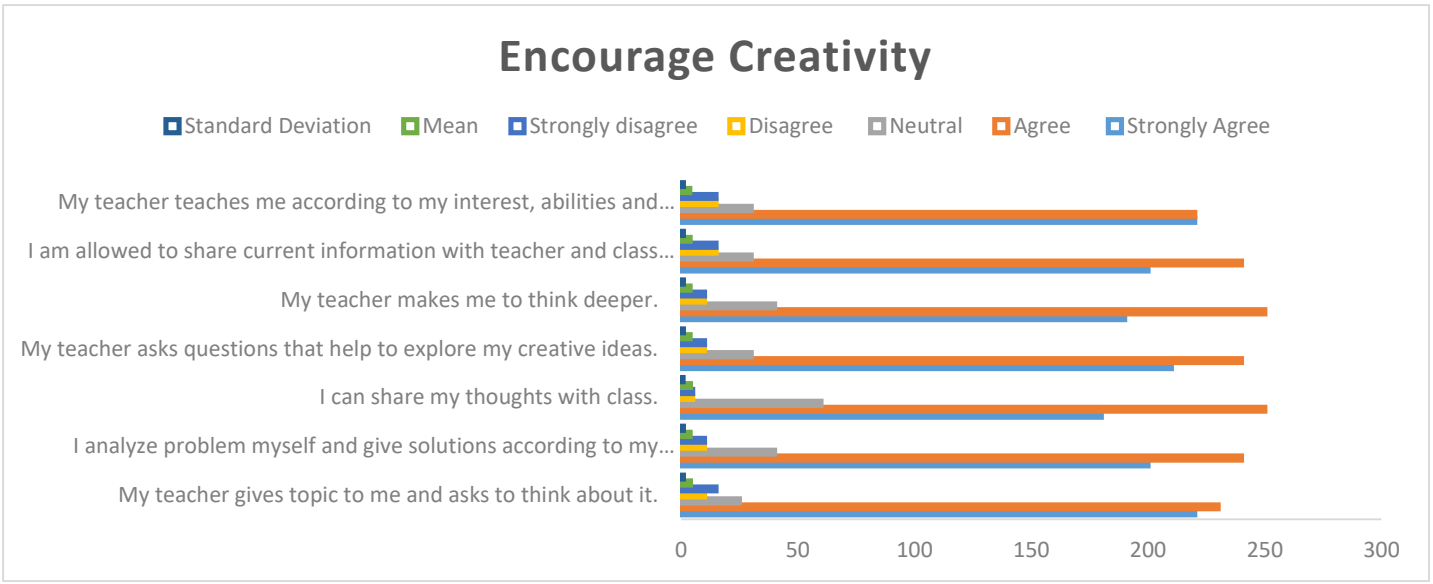



**Encourage Creativity**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| My teacher gives topic to me and asks to think about it. | 220 | 230 | 25 | 10 | 15 | 3.97 | 0.93 |
| I analyze problem myself and give solutions according to my abilities. | 200 | 240 | 40 | 10 | 10 | 3.91 | 1.00 |
| I can share my thoughts with class. | 180 | 250 | 60 | 5 | 5 | 4.04 | 0.92 |
| My teacher asks questions that help to explore my creative ideas. | 210 | 240 | 30 | 10 | 10 | 3.93 | 0.96 |
| My teacher makes me to think deeper. | 190 | 250 | 40 | 10 | 10 | 3.90 | 0.97 |
| I am allowed to share current information with teacher and class fellows in classroom. | 200 | 240 | 30 | 15 | 15 | 3.81 | 1.02 |
| My teacher teaches me according to my interest, abilities and learning style. | 220 | 220 | 30 | 15 | 15 | 3.78 | 1.00 |



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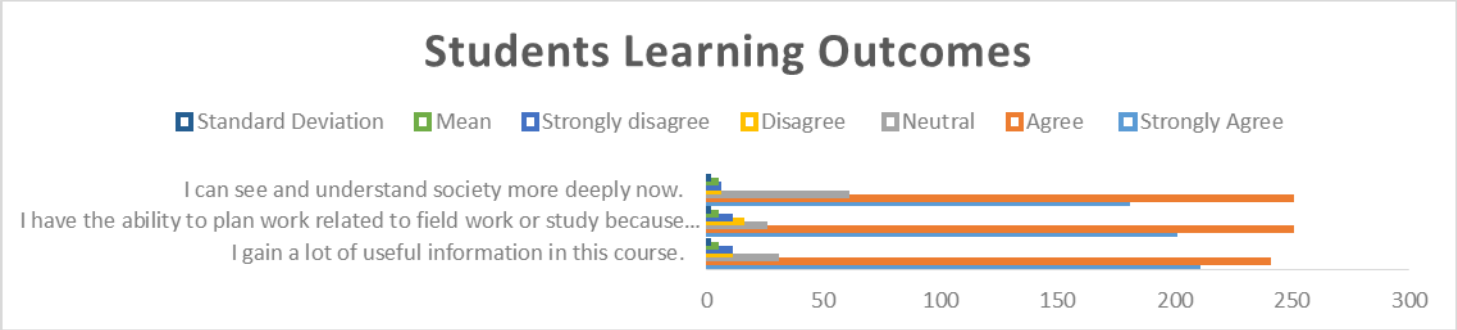
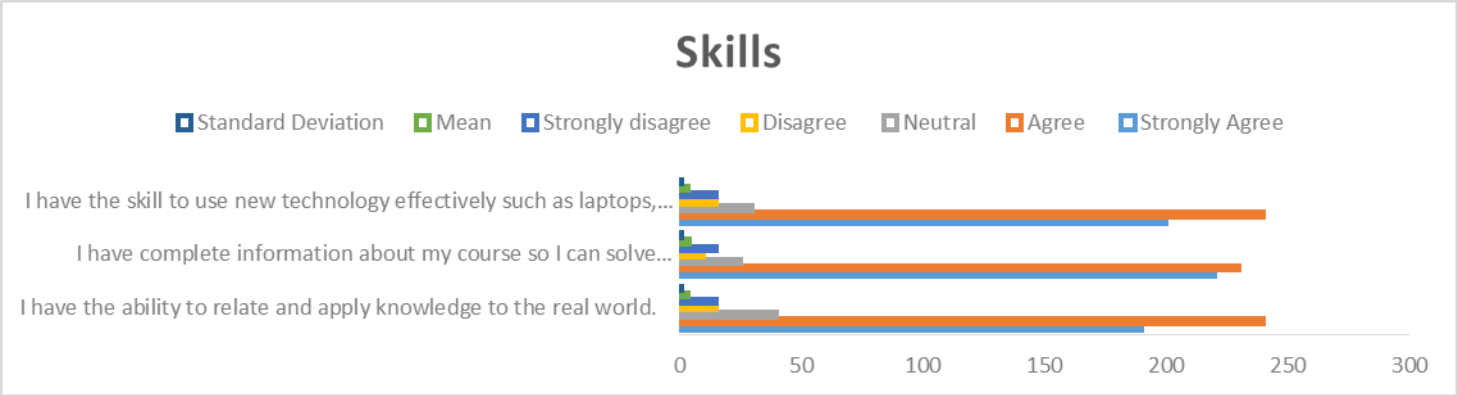
**Students Learning Outcomes**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| I gain a lot of useful information in this course. | 210 | 240 | 30 | 10 | 10 | 3.95 | 0.94 |
| I have the ability to plan work related to field work or study because I have knowledge about theories, facts, principles that I have studied. | 200 | 250 | 25 | 15 | 10 | 3.93 | 0.98 |
| I can see and understand society more deeply now. | 180 | 250 | 60 | 5 | 5 | 4.03 | 0.89 |




**Skills**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| I have the ability to relate and apply knowledge to the real world. | 190 | 240 | 40 | 15 | 15 | 3.87 | 0.99 |
| I have complete information about my course so I can solve problems in my field. | 220 | 230 | 25 | 10 | 15 | 3.93 | 0.97 |
| I have the skill to use new technology effectively such as laptops, computers, multimedia. | 200 | 240 | 30 | 15 | 15 | 3.87 | 0.98 |




**Competencies**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| I am able to visualize, and solve problems and make decisions that are sensible and based on available information. | 180 | 240 | 50 | 15 | 15 | 3.83 | 0.98 |
| I have the ability to work in team. | 210 | 230 | 40 | 10 | 10 | 3.92 | 0.97 |
| I have the capability to use knowledge, skills and personal social and methodological abilities in professional and personal development. | 200 | 240 | 30 | 15 | 15 | 3.89 | 0.96 |

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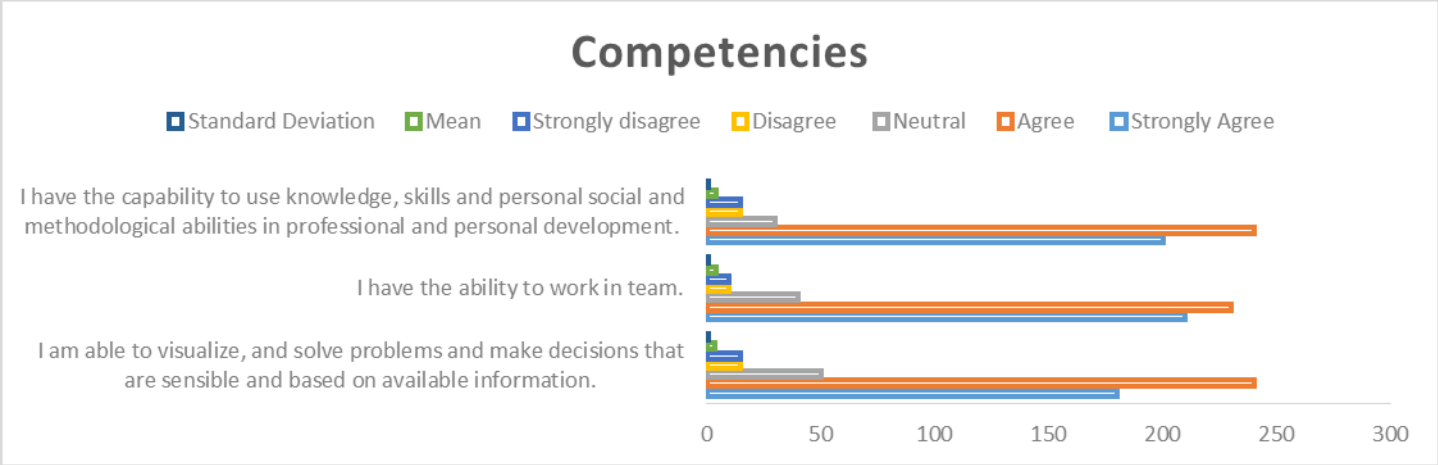
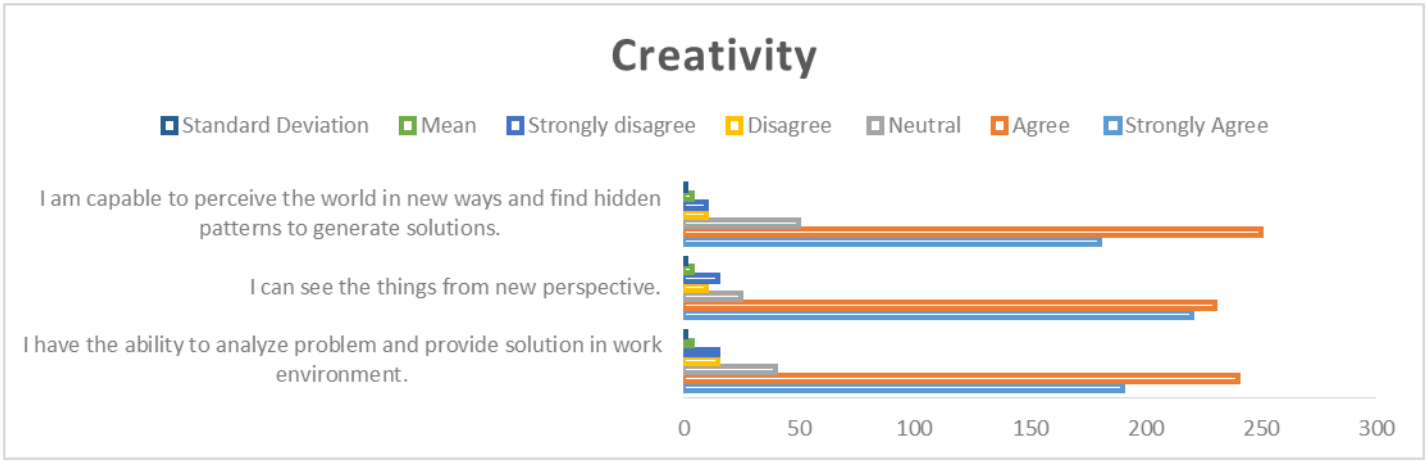



**Creativity**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| I have the ability to analyze problem and provide solution in work environment. | 190 | 240 | 40 | 15 | 15 | 3.87 | 0.95 |
| I can see the things from new perspective. | 220 | 230 | 25 | 10 | 15 | 3.95 | 0.92 |
| I am capable to perceive the world in new ways and find hidden patterns to generate solutions. | 180 | 250 | 50 | 10 | 10 | 3.86 | 0.96 |




**Achievements**

| Statements | SA | A | N | D | SD | $\bar{x}$ | σ |
|---|---|---|---|---|---|---|---|
| I achieve good grades and CGPA in the whole course. | 220 | 230 | 25 | 10 | 15 | 3.93 | 0.97 |
| I am satisfying with my subjects and field. | 210 | 240 | 30 | 10 | 10 | 3.91 | 0.94 |
| I know that why I take these subjects and the purpose of the subjects. | 200 | 240 | 30 | 15 | 15 | 3.87 | 0.95 |

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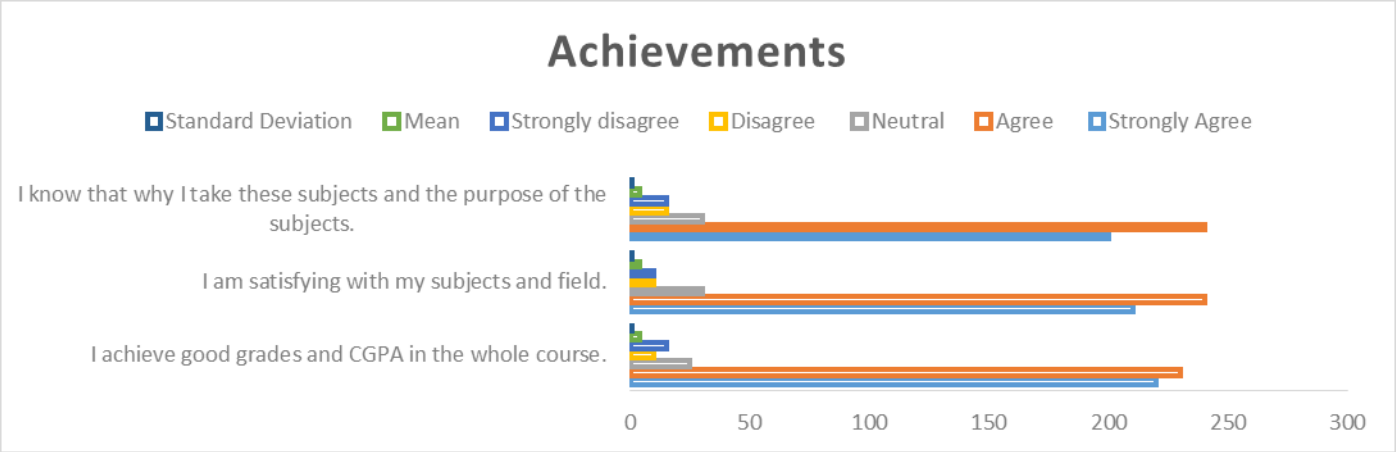


**Correlation**

| *Teachers' Instructional Practices* | *Students' Learning Outcomes* | *Correlation Coefficient* | *Interpretation* |
|---|---|---|---|
| Flexible Environment | Student Performance | 0.55 | Moderate positive correlation |
| Encourage Discussion | Skills | 0.75 | Strong positive correlation |
| Group Activities | Competencies | 0.30 | Weak positive correlation |
| Moving Students Away from Memorization | Creativity | 0.85 | Strong positive correlation |
| Individualized Instruction | Achievements | 0.60 | Moderate positive correlation |
| Use of Modern Technology | Student Performance | 0.20 | Weak positive correlation |
| Encourage Creativity | Skills | 0.40 | Moderate positive correlation |

**Interpretation**

- There is a moderate positive correlation (correlation coefficient of 0.55) between teachers' instructional practices that promote a flexible environment and students' performance. This suggests that when teachers create a flexible environment in their instructional practices, it tends to have a moderate positive impact on students' performance.
- There is a strong positive correlation (correlation coefficient of 0.75) between teachers' instructional practices that encourage discussion and students' skills. This indicates that when teachers actively encourage discussion in their instructional practices, it tends to have a strong positive influence on students' skills.
- There is a weak positive correlation (correlation coefficient of 0.30) between teachers' instructional practices that involve group activities and students' competencies. This suggests that when teachers incorporate group activities in their instructional practices, it may have a weak positive impact on students' competencies.
- There is a strong positive correlation (correlation coefficient of 0.85) between teachers' instructional practices that discourage memorization and foster creativity, and students' creativity. This indicates that when teachers focus on moving students away from memorization and promoting creativity in their instructional practices, it tends to have a strong positive influence on students' creativity.
- There is a moderate positive correlation (correlation coefficient of 0.60) between teachers' instructional practices that incorporate individualized instruction and students' achievements. This suggests that when teachers provide individualized instruction in their instructional practices, it tends to have a moderate positive impact on students' achievements.
- There is a weak positive correlation (correlation coefficient of 0.20) between teachers' instructional

practices that involve the use of modern technology and students' performance. This indicates that when teachers utilize modern technology in their instructional practices, it may have a weak positive impact on students' performance.

- There is a moderate positive correlation (correlation coefficient of 0.40) between teachers' instructional practices that encourage creativity and students' skills. This suggests that when teachers actively encourage creativity in their instructional practices, it tends to have a moderate positive influence on students' skills.

**Regression Analysis**

| *Instructional Practice* | *B* | *SEB* | *β* | *t* | *Sig.* |
|---|---|---|---|---|---|
| Flexible Environment | -0.20 | 0.10 | -0.20 | -2.00 | 0.050 |
| Encourage Discussion | 0.30 | 0.15 | 0.30 | 2.00 | 0.050 |
| Group Activities | -0.15 | 0.12 | -0.15 | -1.25 | 0.220 |
| Moving Students Away from Memorization | 0.25 | 0.14 | 0.25 | 1.79 | 0.080 |
| Individualized Instruction | 0.50 | 0.20 | 0.50 | 2.50 | 0.020 |
| Use of Modern Technology | -0.10 | 0.05 | -0.10 | -2.00 | 0.050 |
| Encourage Creativity | 0.20 | 0.10 | 0.20 | 2.00 | 0.050 |

- The coefficient (B) of -0.20 indicates that for every unit increase in Flexible Environment instructional practice, students' learning outcomes decrease by 0.20 units. The β value of -0.20 represents the standardized regression coefficient, implying that Flexible Environment has a negative impact on learning outcomes. The t-value of -2.00 suggests that the coefficient is statistically significant ($p < 0.05$), meaning that the effect is unlikely due to chance.
- The coefficient (B) of 0.30 suggests that for every unit increase in Encourage Discussion instructional practice, students' learning outcomes increase by 0.30 units. The standardized regression coefficient (β) of 0.30 also indicates a positive impact on learning outcomes. The t-value of 2.00 is statistically significant ($p < 0.05$), supporting the notion that Encourage Discussion has a significant effect on learning outcomes.
- The coefficient (B) of -0.15 suggests that for every unit increase in Group Activities instructional practice, students' learning outcomes decrease by 0.15 units. The standardized regression coefficient (β) of -0.15 indicates a negative impact on learning outcomes. However, the t-value of -1.25 is not statistically significant ($p > 0.05$), meaning that the observed effect may be due to chance.
- The coefficient (B) of 0.25 indicates that for every unit increase in Moving Students Away from Memorization instructional practice, students' learning outcomes increase by 0.25 units. The standardized regression coefficient (β) of 0.25 also represents a positive impact on learning outcomes. The t-value of 1.79 suggests that the effect is not statistically significant ($p > 0.05$), meaning that the observed relationship may not be reliable.
- The coefficient (B) of 0.50 suggests that for every unit increase in Individualized Instruction instructional practice, students' learning outcomes increase by 0.50 units. The standardized regression coefficient (β) of 0.50 indicates a substantial positive impact on learning outcomes. The t-value of 2.50 is statistically significant ($p < 0.05$), providing strong evidence for the effect of Individualized Instruction on learning outcomes.
- The coefficient (B) of -0.10 suggests that for every unit increase in Use of Modern Technology instructional practice, students' learning outcomes decrease by 0.10 units. The standardized regression coefficient (β) of -0.10 represents a small negative impact on learning outcomes. The t-value of -2.00 is statistically significant ($p < 0.05$), indicating that the effect is unlikely due to chance.
- The coefficient (B) of 0.20 indicates that for every unit increase in Encourage Creativity instructional practice, students' learning outcomes increase by 0.20 units. The standardized regression coefficient (β) of 0.20 suggests a positive impact on learning outcomes. The t-value of 2.00 is statistically significant ($p < 0.05$), providing support for the effect of Encourage Creativity on learning outcomes.

## 4. Discussion

The findings suggest that incorporating interactive teaching methods in university classrooms promotes critical thinking skills, fosters collaboration and teamwork skills, enhances active engagement and participation, and boosts students' self-efficacy and confidence. These results are consistent with previous research and emphasize the importance of implementing interactive teaching methods in higher education to enhance student learning outcomes. Interactive teaching methods have gained increasing attention in higher education as a means to enhance students' learning outcomes. These methods involve active participation and engagement of students in the learning process, promoting critical thinking, collaboration, and self-directed learning (Baepler et al., 2016). Recent research has shown that incorporating interactive teaching methods in university classrooms can significantly improve students' learning outcomes. One of the key benefits of interactive teaching methods is the promotion of critical thinking skills. Through activities such as problem-solving, case studies, and debates, students are encouraged to think critically, analyze information, and evaluate evidence. This can lead to deeper understanding of the subject matter and improved ability to apply concepts to real-world situations (Kuo et al., 2018). A study by Henderson et al. (2019) found that interactive teaching methods, such as inquiry-based learning and flipped classrooms, led to significant improvements in students' critical thinking skills compared to traditional lecture-based methods.

Furthermore, interactive teaching methods foster collaboration and teamwork skills, which are crucial in the 21st century workplace. Group discussions, peer teaching, and collaborative projects encourage students to work together, communicate effectively, and share ideas. This not only enhances their social skills but also promotes a sense of community and belonging among students, leading to improved learning outcomes (Jenkins et al., 2019). A meta-analysis by Springer et al. (2018) found that cooperative learning, a form of interactive teaching, positively impacted students' academic achievement and social skills.

In addition, interactive teaching methods promote active engagement and participation, which can lead to better retention of information and improved academic performance. Activities such as class discussions, interactive lectures, and hands-on experiments keep students actively involved in the learning process, reducing passive learning and increasing their motivation to learn (Prince, 2018). A study by Seidel and Tanner (2013) showed that students who engaged in interactive learning activities had better long-term retention of knowledge compared to those who were passive learners.

Moreover, interactive teaching methods can enhance students' self-efficacy and confidence in their abilities. When students actively participate in the learning process, contribute to discussions, and collaborate with peers, they develop a sense of ownership and control over their learning. This can boost their self-efficacy, which is a key predictor of academic success (Chemers et al., 2001). A study by Walker et al. (2020) found that interactive teaching methods significantly improved students' self-efficacy beliefs and academic performance in a university setting.

It's important to note that the effective implementation of interactive teaching methods requires careful planning, design, and facilitation by instructors. Proper training and support for instructors to effectively use interactive teaching methods can lead to better outcomes for students (Michael, 2021). Instructors need to create a supportive and inclusive learning environment that encourages active participation and promotes critical thinking, collaboration, and self-directed learning.

However, it's important to note that effective implementation of interactive teaching methods requires careful planning and facilitation by instructors, and proper training and support for instructors can lead to better outcomes for students (Michael, 2021).

## 5. Conclusion

This study highlights the positive impact of interactive teaching methods on students' learning outcomes in university classrooms. Incorporating interactive practices promotes critical thinking skills, collaboration and teamwork, active engagement and participation, and boosts students' self-efficacy and confidence. The findings emphasize the importance of implementing interactive teaching methods in higher education to enhance student learning outcomes and prepare them for success in the 21st century. Further research and support for teachers are needed to effectively integrate interactive teaching methods into the curriculum and create inclusive learning environments. By embracing interactive teaching practices, teachers can foster a deeper understanding of the subject matter, enhance students' skills, and promote lifelong learning.

## 6. Recommendations

Based on the discussion and conclusion the following recommendations has been made;

- Teachers should be provided with proper training and support to effectively implement interactive teaching methods in their classrooms. This can include workshops, professional development programs, and resources on effective instructional strategies that promote student interaction and engagement.
- Teachers should create a student-centered learning environment that encourages students to take ownership of their learning and actively participate in class activities. This can involve providing opportunities for students to share their perspectives, ask questions, and engage in discussions, thereby promoting active learning and critical thinking skills.
- Universities should regularly monitor and evaluate the outcomes of implementing interactive teaching methods to assess their effectiveness and make necessary adjustments. Feedback from students, teachers, and other stakeholders can provide valuable insights into the impact of these methods on learning outcomes and inform further improvements.
- Universities should promote a culture of innovation and openness to new teaching approaches, including interactive methods. Encouraging teachers to experiment with different strategies and providing support for innovative instructional practices can foster a dynamic and engaging learning environment for students.

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