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Flipped Classroom: Promoting Active Learning on Students' Engagement At A Higher Level

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Abstract
This study is based on flipped classroom: promoting active learning on students' engagement at a higher level. The objectives of this study is to analyze the impact of flipped classroom on students' engagement to promote active learning from perception of students. Also, investigate the impact of flipped classroom in promoting active learning on the basis of gender comparison as well as examine the role of technology in enhancing students' engagement and active learning in flipped classroom. Quantitative research design is used to investigate the study. Population of the study were three public sector universities in Multan district. Sample size of the study were 365 students from social sciences departments. SPSS used for statistical analysis to obtain data using different inferential statistics as Independent Samples t-Test. On the basis of analysis, findings of the study shows that flipped classroom promoting active learning on students' engagement at a higher level. Results also implies that students' levels of engagement in flipped classroom learning may be influenced by their gender. It was recommended that flipped classroom encouraged educators to promote active learning and increased level of students' engagement.
Keywords: Flipped Classroom, Active Learning, Student Engagement, Higher Education

1. Introduction

Technological advancements have emerged in almost every aspect of modern life, and education is no exception. As new technologies develop, they are adopted in educational advancement to improve traditional instructions. Technological advancement offers novel perspectives and innovation in learning and education. The use of educational technology has contributed to boost in innovative instructional strategies and online learning to enhance students' learning outcomes (Wei et al., 2020).

Flipped classroom is such an innovative approach that has popularity in higher education. The flipped classroom approach has arisen as a distinctive and encouraging instructional approach in higher education. So, rather than the traditional method of learning where students listen to lectures in class and do homework at home, the flipped classroom flips things around. In this model students watch pre-recorded lectures and go through the content material before coming to class. In this way, students have access to the content at their own convenience, and they can re-watch, pause the video lecture and clarify all the difficult concepts. During the class time, they pay attention to discussion, interactive activities and problem-solving skills. It is an innovative approach to learning which is important for the success of the 21st century.

Flipped classroom is a noticeable option in the world of education. Aside from instructional proficiency, teacher must be technologically competent. Higher education need technology to foster innovation. Higher education innovation enhances abilities like critical thinking, creativity, communication and teamwork (Rakhmalinda, 2024). Flipping a classroom means putting the traditional classroom on its side. (Güler, Kokoç, & Bütüner, 2023). Flipped classroom is a key component of integrating technology and fosters an environment for collaborative learning in higher education (Günbatar, 2021). Flipped classroom use screen casting, webinars and cloud based technologies to support teachers training and delivery (Mortaza Mardiha et al., 2023).

The idea behind the flipped classroom as a pedagogical model is that learning and teaching activities that were previously completed in class are now able to be done at home through reviewing previously taught materials, and learning activities that were previously completed at home, like having students report back on topics or learning materials, are now able to be done in class to foster valuable knowledge (Lundin et al., 2018; Joy et al., 2023). Therefore, students must be devoted in learning activities and active participation inside and outside of the classroom in order to fulfill the flipped classroom with the use of IT (Aprianto, Purwati, 2020). Students are encouraged to learn new content actively via reading and watching video lectures, outside of class. It enables students to keep in mind and evaluate the information provided for class (Bachiller & Badía, 2020). Students utilize academic expertise to solve group problems with peer instruction (Huang et al., 2023).

Multiple studies have examined the flipped classroom approach to promote active learning on students' engagement across several educational contexts and academic disciplines (Jamaludin, & Osman, 2014; Unamba & Ogbonnaya, 2016; Violita & Budiraharjo, 2022). The results of these studies have shown encouraging, indicative that when compared to traditional approach, the flipped classroom approach can promote active learning, improve students' engagement, improve understanding, increase motivation and enhance academic performance. Therefore, this study

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investigate the flipped classroom to promote active learning on students' engagement at higher level based on Reeve's (2013) four aspects of conceptualizing the students engagement namely Behavioral, Emotional, Cognitive and Agentic. First three aspects affected by student-teacher relationship and instructional support during learning activities (Reeve & Tseng, 2011). Whereas agentic engagement is active and comprises action and generating their own instructional collaboration under the supervision of teacher (Reeve, 2013).

Thus, it is significant for educators to assist students' learning and skill development through the use of instructional methods (Tsai, Lee, & Shen, 2013). The flipped classroom approach would improve student performance by creating a learning environment that would raise student engagement and yield better educational outcomes (Wilson, 2013). Finally, flipped classroom provide opportunity to educators and stakeholders, which help them a new role in the active classroom. Pre-class time instructors devote more class time to activities and problem solving exercises while students acquire practical technological knowledge via online videos, instructors may spend less time in delivering technical subject matter (Velegol & Mahoney, 2015).

Therefore, this research paper aims to provide inclusive analyses of student's engagement to promote active learning in flipped classroom across different disciplines at university level. By synthesizing and analyzing the body of existing research this study pursues the research gaps in knowledge provides educators, policymakers and researchers with a comprehensive understanding of the flipped classroom to promote active learning on students' engagement. This research thesis aims to explore the flipped classroom: promoting active learning on student engagement, drawing upon existing research and conducting empirical studies to further validate its impact.

1.1. Objectives Of The Study

This study achieved the following objectives:

1. To analyze the impact of flipped classroom on students' engagement to promote active learning from perception of students.
2. To analyze the impact of flipped classroom in promoting active learning on the basis of gender comparison.
3. To examine the role of technology in enhancing students' engagement and active learning in flipped classroom.
4. To provide suggestions for educators & stakeholders to implement flipped classroom in higher educational settings.

1.2. Research Questions

1. What is the role of behavioral engagement in the promotion of active learning in a flipped classroom?
2. What is the role of emotional engagement in the promotion of active learning in a flipped classroom?
3. What is the role of cognitive engagement in the promotion of active learning in a flipped classroom?
4. What is the role of agentic engagement in the promotion of active learning in a flipped classroom?

1.3. Hypothesis Of The Study

1. The level of access to flipped classrooms resources significantly predict student's engagement in flipped classrooms training.
2. There is a significant difference in students' engagement in flipped classrooms learning between male and female students.

2. Literature Review

This research study explore the flipped classroom promoting active learning on students at higher education from perception of students, as well as providing a comprehensive summary of prior and present studies on flipped classroom. As a result, this study investigates the previous study on the use of flipped classroom approach in educational context particularly at university level.The flipped classroom approach offers novel learning experiences into consideration of students' needs and rapidity (Cheng, Ritzhaupt, & Antonenko, 2019) to read and watch video clips about content before class, encouraging interactive learning among teachers and students Mustofa, M. (2022). Students are encouraged to analyze and interact throughout the learning process by using the knowledge they have acquired from each phase. It is a prerequisite for learners during the "pre-class" phase to be engaged with the instructor's offered learning materials in order to receive the required introduction to the "in-class" phase, where they are assigned a series of learning tasks, such as team conversations and presentations, and receive little support from instructor. Subsequently, in the "post-class" phase, students are given various assignments or tests to complete as a way to reinforce the knowledge they have learned thus far. The results of these instructional stages have encouraged a number of prior investigations concerning the efficacy of flipped classrooms in other educational settings (McLean and Attardi, 2023).

A study conducted at the City University of New York by Entezari and Javdan (2016) focused on students' engagement. Autonomy and psychology students were selected to be a control and experimental group from spring and fall semester courses. Both classes used the flipped classroom model in the study, but the challenge was to compare a flipped classroom model with different levels of students' engagement. Data was gathered in a quantitative way

from both classes. The study results demonstrate not only the benefits of flipped classroom but also suggest that flipped classroom improve by utilizing the active learning techniques (Entezari and Javdan, 2016).

Similarly, Unamba, Izuagba, & Ogbonnaya, (2016) investigated the use of flipped classroom model to enhance students' engagement and active learning among primary school pupils in Algebra. The study conducted on Owerri Educational zone of Imo State pupils. One research question and two hypothesis were generated on the basis of study purpose. Researcher used a four point rating scale questionnaire. Results of the study revealed that the use of flipped classroom model enhance behavioral, emotional, cognitive and agentic engagement. In addition to promote active learning among algebra pupils and there is no significant difference between male and female, urban and rural pupils. The study point out that teacher should implement on flipped classroom model to promote active learning.

Another study by (Boevé, Meijer, Bosker, Vugteveen, Hoekstra, and Albers, 2017). The aim of this study is to investigate the students' behavior in flipped classroom as compared to traditional classroom. This investigation used a quantitative approach to compare a flipped classroom with a traditional classroom for elementary data analysis. The respondent grades in each lecture were completely established by conclusions which accounted for 100% of their total grade. The study findings revealed that this form of student engagement raised the question response rate when compared to traditional classroom. Although this study did not provide precise data on students' performance, it proved a rise in student's engagement inside the classroom.

The concept of self-regulated learning given in the research by Muir (2018), in which four aspects of engagement as behavioral, emotional, cognitive and agentic were examined using flipped classroom both within and outside of class. The study used a mixed-method approach comprising 27 students from 12 grade math class in Australia. The quantitative data collection comprises 42 Likert scale items ranked from 1 to 10 based on use of online resources. While quantitative data resulted through interviews with 20 questions from 27 students. Findings of qualitative data reveals that students began to build a relationship between this sense of independence and sense of proficiency (Muir, 2018).

Castedo, López, Chiquito, Navarro, Cabrera, & Ortega (2019) highlighted that flipped classroom involves to obtain concepts prior to class and applying concepts in class time to solve problems. The main purpose of the study were to assess the impact of learning with a focus on highly engaged students, investigate how students' participation perceive their experience in this approach, decrease students absences and increase exam attendance. The findings indicate that flipped classroom paradigm has direct impact on students learning especially high level of students' engagement.

Alam, Khurshid, & Alam (2020) in his research paper stated that flipped classroom model has been introduced novel teaching strategy in modern era in which lecture convey outside of the classroom and assigned homework during class time by the utilization of technology that is the fundamental aspect of flipped classroom. The main goal of his research study was to determine the students and teachers perception regarding science flipped classroom. For that reason, group discussion conducted with students and semi-structured interviews with teacher to know their perception regarding the concept of flipped classroom. Results of the study draw conclusion that teachers and students both perception appreciated the student-centered approach by flipped classroom. They also believe that the idea of flipped classroom model is feasible in Pakistan institutions. The study recommended that appropriate training programs are required for teachers in order to make teaching learning process to implement on flipped classroom affectively.

In addition, Bindumadhavan, K., & Anjani Srikanth, K. (2022), conducted Work Integrated Learning Programs (WILP) as a form of ongoing instruction for working employees. Instruction takes place either in person or online. Study conducted lecture method through traditional way contained on 16 sessions each of two hours) on the other hand flipped classroom model contained on 11 sessions each of two hours. Findings of the study shows that flipped classroom model had a positive impact on students' engagement when it compared to traditional classroom model.

Furthermore, Violita & Budiraharjo (2022) investigated the active learning and students' engagement that seemed in flipped classroom model. The main objective of this study was to determine what to extend flipped classroom increase students' engagement and active learning in Educational English Literature class. The study adopted quantitative research design by using a questionnaire. Findings of the study showed that students' behavioral, emotional, cognitive and agentic engagement were improved as well as active learning enhanced through implementing flipped classroom model in Educational English Literature class. Study also concluded that students could get higher engagement by engaging in discussion, completing task and participate actively in learning activities.

Baig & Yadegaridehkordi (2023) in his study explores the implementation of flipped classroom model in higher education through the concentration of tools, role of technology, courses, instructional activities, and contemporary obstacles. The study highlighted the certain instructional activities within multiple programs that improved the efficiency of flipped classroom learning in higher education. The obstacles were discussed as well as potential solutions to these challenges for teachers and students might encounter when implementing flipped classroom. The research being conducted aim to acquire a greater comprehension of flipped classroom learning incentives, technology and prospects for higher education.

Verdonck, Wright, Hamilton, & Taylor (2024) indicated that flipped classroom approach positively impact on students learning experience and outcomes, significantly less is known about the educators' experience. The goal of this research to investigate how educators from various discipline at a regional Australian University defined their experiences with the flipped classroom approach. The research used a qualitative approach by semi-structured interview for collection of data from educators who had used a flipped classroom in previous 4 years. The study emphasized the proactive teaching practices and praised the availability more active learning possibilities in the classroom. Findings of the study reveals that universities should give sufficient support to address both the well-being of educators and practical aspects of implementing the flipped classroom approach.

These researches were completed by Entezari and Javdan (2016), Unamba, Izuagba, & Ogbonnaya, (2016), (Boevé et al., 2017), Muir (2018), Castedo, López, Chiquito, Navarro, Cabrera, & Ortega (2019), Alam, Khurshid, & Alam (2020), Bindumadhavan, K., & Anjani Srikanth, K. (2022), Violita & Budiraharjo (2022), Baig & Yadegaridehkordi (2023) and Verdonck, Wright, Hamilton, & Taylor (2024). These studies show that flipped classroom promote active learning as well as student engagement. Some studies used a qualitative design in which students participate in interviews while most of used a quantitative design to collect data through surveys using Likert scales for the purpose of comparing flipped classroom with traditional classroom and examine students' engagement.

3. Methodology

A quantitative research design was used to conduct study. The target population of study were three public sector universities including The Women University Multan, Bahauddin Zakariya University Multan and Emerson University in Multan district. The population included students from social sciences department only. There were 6947 students from BS, Masters, and M. Phil or other programs were involved for the study purpose. A total sample size was 365 students in which (164 male, 201 female) respondents by using convenience sampling technique. Sample was calculated by Rao Soft for the investigation.

The researcher developed an instruments used a structured questionnaire with 27 items that is based on related literature and four features of engagement by Reeve (2013), namely behavioral engagement, emotional engagement, cognitive engagement, and agentic engagement. A five-point Likert scale were used that given range (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) used in the instrument. Data was analyzed through inferential statistics Independent Samples-t Test by using SPSS software. The reliability of the instrument in this study has been assessed through Cronbach's alpha. Our scale has high level of reliability and internal consistency with Cronbach's alpha of students scale has .926 with 27 items. Consistency of these items improve the measurement overall reliability of both scales as shown in table.

The above mentioned table shows the reliability of the instrument. Our scales has a high level of reliability and internal consistency with Cronbach's alpha of scale has .926 with 27 items. Consistency of these items improve the measurement's overall reliability.

4. Results and Findings

Table 1: Reliability statistics

Table 2: Independent sample T-Test mean difference students' engagement in flipped classrooms in active learning with respect to gender of students (N=365)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Students' Scale	.926	27

	Male *(n=164)*	Female *(n=201)*				95 % CI		*Cohen's d*
Variables	***M (SD)***	***M(SD)***	***df***	***T***	***p***	***LL***	***UL***	
Students engagement in active learning	112.5061 (12.31264)	122.2189 (14.82437)	362	7.242	.000	7.4412	13.13	0.35

Note: Male and female students' engagement levels differ statistically significantly ($p < 0.05$), according to the independent samples t-test. With a mean difference of 122.2189, female students' engagement ratings are substantially greater than those of male students. This implies that students' levels of engagement in flipped classroom learning may be influenced by their gender.

Table 3: Mean and Standard Deviation against each factor of Student Engagement Scale.

Description	N	Mean	Std. Deviation
Access of Flipped Classroom			
I find it easy to access pre-recorded lectures and videos in the flipped classroom approach	365	3.96	.967

I find the flipped classroom approach easy to adapted and more engaging	365	3.94	.856
I have technical support and resources for flipped classroom learning.	365	3.93	.979
I have access to the basic technology resources to implement flipped classroom effectively.	365	3.90	.977
Behavioral Engagement			
I am fully focused and attentive during flipped classroom learning	365	3.87	.910
I actively participate in flipped classroom learning environment	365	3.90	.845
I listen very carefully with great interest.	365	4.03	.934
I actively contribute and participate in discussions during the flipped classroom session.	365	3.99	.982
I feel more motivated in flipped classroom settings.	365	4.02	.931
I actively engage and participate in the flipped classroom session.	365	4.05	.903
I successfully complete my task using the provided learning material.	365	3.97	.906
I dedicate a significant amount of attention and effort into my studies during the flipped classroom	365	4.02	.881
Emotional Engagement			
I feel comfortable and at ease with learning through the flipped classroom environment.	365	3.94	.904
I like flipped classroom because it allows me to learn anytime and anywhere.	365	4.18	.775
I really enjoy learning with the flipped classroom model.	365	3.96	.881
I really enjoy as an active learner in the flipped classroom	365	3.98	.909
I doesn't feel nervous at all through the flipped classroom setting.	365	3.67	1.134
I've learned so many new things by joining the flipped classroom environment.	365	4.04	.958
Cognitive Engagement			
I can create my own examples to understand the important concepts in the flipped classroom.	365	3.84	1.005
I am able to make all the different ideas fit together in the flipped classroom learning environment.	365	3.90	.892
I can connect what I'm learning with my own experiences when studying for this class	365	3.97	.873
I feel fully mentally involved, when I work on something in the flipped classroom session.	365	4.01	.880
I feel encouraged to explore new things in the flipped classroom	365	4.05	.835
Agentic Engagement			
I express my decisions and attitudes during flipped classroom learning	365	3.94	.980
I ask questions to help me learn more during flipped classroom learning.	365	3.97	.903
I adjust my learning approach to maximize my understanding	365	4.05	.874
I try to make the topics we're learning as interesting as possible	365	4.06	.848

5. Discussion

The existing study analyze the flipped classroom to foster active learning and four dimensions of students engagement. It is notice that access of flipped classroom, level of students' engagement (behavioral engagement, emotional engagement, cognitive engagement and agentic engagement) that effect the academic performance of students. The flipped classroom model is an educational environment that promotes discovering learning, problem-based learning, experimental learning, and student-centered learning.

Flipped classroom refers to the teaching mode that reverses traditional instruction by delivering teachers' lectures at the pre-class stage in the form of instructional videos or other media to enable teachers to have more time in the class to help students do exercises and solve the learning problems they encounter (Bergmann & Sams, 2012). The concept of active learning refers to students' active engagement and participation in the learning process (Peng & Sampson, 2017). According to the research, students' participation in active learning activities rose and their academic performance improved when the classroom was flipped.

(Strelan & Osborn, 2019) look at how flipped classrooms affect students' performance and involvement. They look into how learning outcomes and student engagement are impacted by having access to materials outside of scheduled class times. O'Flaherty & Phillips (2015), assess the application of flipped classrooms in higher education through a scoping review. Their analysis clarifies how flipped classroom approaches affect student engagement and learning,

which can have an indirect bearing on resource availability, even if it does not specifically address resource availability.

Behavioral engagement deals with the behavior of student's during learning process. Findings shows that students are fully focused and attentive during flipped learning. Emotional engagement refers to feelings or excitements regarding their learning experiences. Findings indicate that majority of students feel more comfortable and motivated in flipped learning. Although, cognitive engagement states that the intellectual involvement in their learning. Mostly participants indicate that they are fully mentally involved in flipped classroom. While agentic engagement deals with interest in learning process. Larger amount of participants perceive they engage in learning with great interest.

In summary, by flipping traditional instruction, encouraging problem-solving, active learning, and student-centered learning experiences, the flipped classroom model provides a revolutionary method to education.

6. Conclusion

The main objective of the study flipped classroom: promoting active learning on students' engagement at higher level based on collected data from perception of students. The findings of the study indicate that flipped classroom approach significantly impact on students engagement to promote active learning on students' engagement. According to analysis of perceptive data 84.1% of students really enjoy as an active learner in flipped classroom. They also like a flipped classroom model with 83.3% response rate.

The study conclude that basic technology resources plays a vital role to enhance students' engagement and active learning to implement flipped classroom effectively. It indicates that impact of flipped classroom in promoting active learning may be influenced by their gender. The findings suggest that flipped classroom approach has positive impact on students' engagement from perception of students. Also it conclude the flipped classroom promoting active learning on students' engagement at higher level.

Findings evidenced that flipped classroom promoting active learning on students' engagement at higher level. Thus, study provides a valuable insights and it has revealed to be fruitful pedagogical strategy that promotes active learning on students' engagement in various academic disciplines.

Recommendations

Recommendations and suggestions of present study to promote active learning and students' engagement using flipped classroom approach are as:

- For educators, the flipped classroom approach offers a valuable paradigm to enhance students' engagement and promote active learning, hypothetically foremost to better learning outcomes.
- Universities may adopt this approach to improve overall performance of students and learning outcomes.
- It is needed to conduct a mentoring sessions regarding the teaching practices of flipped classroom experiences.
- It is recommended for stakeholders, educators and policy makers to develop more effective pedagogical strategies to enhance students' engagement to implement flipped classroom.

Suggestions

- The study is conducted in just Multan district. For further studies there is need to take two or more district or a region or a province.
- The study is limited due to social sciences disciplines, future researches should study across various disciplines and institutions including technical colleges.
- It is also suggest to explore challenges to adapt flipped classroom approach.

Limitations

The research study has limited. These might be include:

- This study attained articles from some databases websites including researchgate, Springer Link, Science Direct and mostly use Google Scholar. Although, these sources cover a literature but future researches may be use additional databases in order to make sure more inclusive exposure of existing literature.
- The study mainly focused on social sciences departments in higher education, further studies might be conduct on life sciences departments in higher education or especially technical or vocational institutions.
- This study primarily investigated on flipped classroom promoting active learning on students engagement at higher level, future studies might be investigate the strategies to foster active learning in flipped classroom.

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