MS Research Thesis

FLIPPED CLASSROOM AT HIGHER EDUCATION INSTITUTION: ANALYSIS OF STUDENTS AND TEACHERS PERCEPTIONS

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A thesis submitted in partial fulfillment of the requirement for the degree of MS Education

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AUTHOR'S DECLARATION

It is hereby declared that author of the study has completed the entire requirement for submitting this research work in partial fulfillment for the degree of MS Education. This thesis is in its present form is the original work of the author except those which are acknowledged in the text. The material included in the thesis has not been submitted wholly or partially for award of any other academic certification than for which it is being presented.

_____

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SUPERVISOR CERTIFICATE

The thesis titled “Flipped Classroom at Higher Education Institution: Analysis of Students and Teachers Perceptions” submitted by Ms. Sana Tanveer Reg no 22FOE/MSEDU/S23 is partial fulfillment of MS education, has been completed under my guidance and supervision. I am satisfied with the quality of student’s research work and allow her to submit this for further process as per IIUI rules and regulations.

_____

Prof. DR. Muhammad Munir Kayani

DEDICATION

I dedicated this fruit of my efforts to ALLAH (S.W.T): creator of this world and to his beloved, HAZRAT MUHAMMAD (S.W.W.W) from whom the world has been created. A very special feeling of gratitude to my parents whose prayers and affection are a source of strength for me at every step of my life and then to my ideal and honorable supervisor and siblings whose full support, cooperation and guidance paved the way to these achievements.

May Allah always keep them safe and sound!

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Abstract

Technology has revolutionized the teaching learning process. Today, web-based learning is utilized world-wide, and over the past few decades, numerous educators have adopted active teaching and learning techniques. A new teaching approach called "Flipped-Classroom" has been introduced in the current era. The fundamental components of a flipped classroom include transferring lectures outside of the classroom and assigning homework electronically during class. The objectives of this study were to identify teachers' perception on the effectiveness of the flipped classroom in higher university settings. And to find out the perception of students regarding the use of the flipped classroom model in higher university settings. This study employed a mixed methods approach. Students and teachers of Department of Educational Leadership and Management (ELM) of International Islamic University Islamabad were considered as population of the study. Simple random, universal sampling techniques and purposive sampling techniques were used in this study. The research followed a sequential explanatory mixed-methods design**,** combining quantitative data collected through questionnaires from 473 students with qualitative insights derived from interviews with 20 faculty members, following the sample size provided by Gay (2000). For data analysis, questionnaires were analyzed using mean scores and t-test. The interviews were analyzed using thematic analysis. Findings revealed that most students had a positive view of the flipped classroom approach. They felt that it helped them take part more actively in class, understand the material better, think more critically, and take more responsibility for their own learning. Teachers also saw the benefits of the flipped classroom, such as its ability to support more effective instruction. The study found that the flipped classroom model supports critical thinking and active learning, particularly when students are motivated and have access to the necessary technology. Based on these results, the study suggests that institutions should offer professional development for instructors on flipped teaching methods, ensure fair access to digital tools and resources, and adapt teaching strategies to meet the needs of different student groups. It also recommends that schools invest in better digital infrastructure and set up systems to track student participation in pre-class activities. Future research should look at the long-term effects of the flipped classroom and how it works in various educational settings.

Keywords*: Flipped Classroom, effectiveness, perception, integration of technology*

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CHAPTER 1
INTRODUCTION

The Flipped Classroom (FC) is a teaching method in which students learn the lesson material before class, usually by watching videos or completing readings, and then applying what they've learned during class activities. This approach is different from traditional teaching where teachers lecture during class time. The idea behind Flipped Classroom is to make learning more student-centered, drawing from theories by Piaget and Vygotsky. Research shows that using technology like computers and the internet to support FC can help students learn better, become more engaged, and develop critical thinking skills. It can also reduce anxiety about learning. However, some teachers are hesitant to use Flipped Classroom because they worry it might take more time to prepare, or they might not feel confident using technology.

The flipped classroom approach is based on two main ideas: pre-class preparation and active learning in class. Before coming to class, students study the basics on their own by watching videos or using other resources. This helps them understand the topic before class. During class, they focus on applying what they've learned through activities like problem-solving, discussions, and teamwork. This method changes the traditional way of teaching, where students passively listen to lectures in class. Instead, it creates a more interactive and engaging environment. Students work together, think critically, and solve problems, building skills that are important for real-life success (Røkenes & Han, 2023).

1.1 Background and the Context of Study

Higher education has seen a paradigm change in recent decades, moving away from traditional, lecture-centric teaching approaches and toward more participatory, student-focused teaching strategies. The flipped classroom is a key component of this movement. It is an instructional strategy that basically flips the traditional learning environment by bringing activities that would typically be considered homework into the classroom and delivering instructional content—often online—outside of the classroom (Anem & Fatima, 2017).

Through self-paced study sessions before class and interactive sessions with peers and teachers, students can shift from passive to active learning with the help of the flipped classroom model. Theoretically, this method is based on constructivist learning theories, which place an emphasis on the growth of higher order cognitive

abilities and situated cognition—where learning is socially constructed and contextual (Singh, 2020).

While the flipped classroom has the potential to improve learning outcomes and boost student engagement, previous research has shown that teachers' perceptions of its efficacy and acceptance vary. Studies also point to potential difficulties in implementing such flipped models, such as the need for initial preparation and the need for students to adjust to a more independent learning style (Vitriani, 2023).

International studies have shown that flipped classrooms can improve academic performance, student satisfaction, and engagement across various disciplines. However, implementing this model in Pakistani higher education presents unique challenges. Khurshid (2020) and Qaisar (2019) report that limited access to digital devices, inconsistent internet connectivity, and resistance to shifting from teacher-centered methods often hinder the effectiveness of FC. Despite these barriers, studies conducted at institutions like IIUI suggest that students respond positively to flipped learning when supported by structured materials and guided facilitation (Minaz, 2018).

This study intends to delve into the perceptions of students and teachers regarding the flipped classroom's effectiveness in higher education. It aims to provide a broader understanding of both the potential pedagogical benefits and the practical challenges they foresee as future educators. By incorporating their viewpoints, the study seeks to offer insights relevant to the implementation and continuous improvement of this instructional model in the higher education context, thereby contributing to the optimization of pedagogical strategies across universities.

1.2 Problem Statement

Traditional lecture-based teaching methods continue to dominate higher education in Pakistan, often resulting in low student engagement, limited critical thinking, and a lack of collaborative learning opportunities (Khurshid, 2020; Qaisar, 2019). As demand for more effective, student-cantered approaches grows, the Flipped Classroom (FC) model has emerged as a promising alternative. International evidence highlights its potential to enhance student performance, motivation, and active learning. However, the implementation of FC in the Pakistani context is still at an early stage and faces challenges such as inadequate digital infrastructure, teacher preparedness, and student resistance to self-regulated learning (Tufail, 2015; Minaz, 2018). Despite growing interest, few empirical studies have investigated how students and teachers in

Pakistani universities perceive the flipped classroom model, and even fewer explore both groups simultaneously.

Existing literature highlights that the flipped classroom model has the potential to enhance student engagement, promote active learning, and improve academic performance in higher education. Studies indicate that pre-class preparation allows students to grasp fundamental concepts, enabling more meaningful discussions and problem-solving activities during class time. While numerous studies focus on student experiences, there is limited research examining both students' and teachers' perceptions of the flipped classroom model in higher education. Understanding these perspectives is crucial for optimizing instructional strategies and ensuring the successful implementation of the flipped classroom model. Therefore, the present study aims to explore Flipped Classroom at Higher Education Institutions: Analysis of students' and teachers' perceptions.

1.3 Objectives of the Study

i. To find out students' perceptions regarding the effectiveness of the flipped classroom in higher education institutions
ii. To compare the perceptions of BS and MS students regarding the use of flipped classroom
iii. To examine teachers' perceptions of the pedagogical impact of the flipped classroom model in university settings.

1.4 Research Questions

i. What are the students' experiences and attitudes toward the flipped classroom approach in higher education?
ii. What are the key factors influencing teachers' perceptions of the effectiveness of the flipped classroom model in higher university settings?

1.5 Research Hypothesis

H_0: There is no statistically significant difference in perceptions of the flipped classroom between BS and MS students in higher education institutions.

1.6 Significance of Study

This study was important because it improved theoretical knowledge as well as real-world application in the field of higher education pedagogy. By having a clear understanding of how teachers and students viewed the flipped classroom paradigm, it became possible to utilize evidence-based teaching strategies that supported student

engagement, learning outcomes, and overall satisfaction with the educational experience.

This study is important for many in higher education. It helps teachers understand how flipped classrooms can improve learning and engage students. Curriculum designers can use the findings to create lessons with technology and active learning strategies. For administrators, it shows how flipped classrooms can boost student success and satisfaction while supporting the need for digital tools and teacher training. Students benefit by gaining better academic results and essential skills like critical thinking and teamwork. Researchers can also use this study as a starting point for exploring new teaching methods, especially in areas with limited resources. The completion of this study was essential for promoting ongoing development and growth in teaching and learning practices in higher education.

1.7 Delimitations of the Study

This study was delimited to

i Female students and teachers from department of Educational Leadership and Management, Faculty of education, IIUI.

1.8 Conceptual Definitions

1.8.1 Flipped Classroom

A flipped classroom is based on the premise that lectures, or direct instruction are not the most effective use of class time. Instead, students learn content before class, freeing up class time for tasks that require higher level thinking. This approach emphasizes student engagement and active learning during class time.

1.8.2 Effectiveness

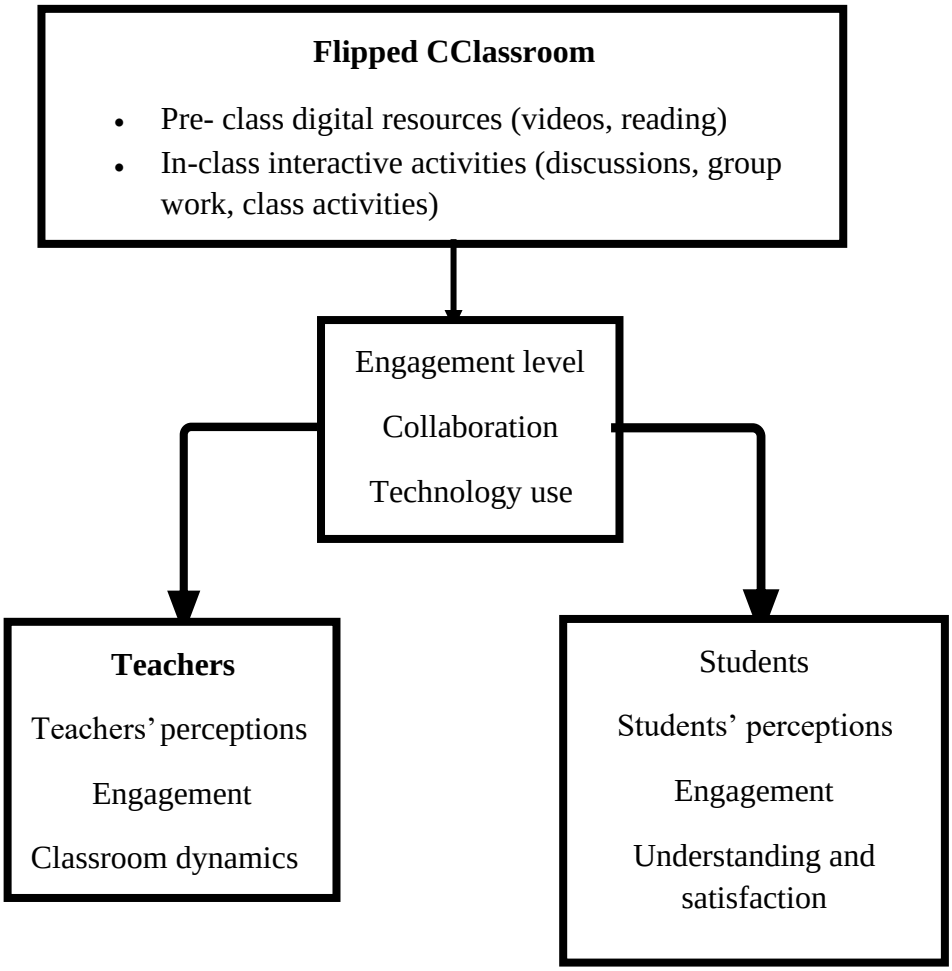
Measured in terms of student's engagement, skill development, and academic performance as perceived by students and teachers.

1.8.3 Perception

Defined as the attitudes, beliefs, and experiences of students and teachers toward the flipped classroom model, gathered through questionnaire and interviews.

1.9 Conceptual Framework

This study is grounded in constructivist learning theory, particularly the works of Piaget (1952) and Vygotsky (1978), which emphasize that knowledge is actively constructed through interaction, reflection, and experience.



(Sharom, 2021)

1.9.1 Components of the Framework:

1.9.1.1 Pre-class digital resources (e.g., video lectures, readings)

These serve as the foundational learning input, allowing students to engage with core content at their own pace before class. According to Bishop & Verleger (2013), this aligns with self-directed learning and metacognition.

1.9.1.2 In-class interactive activities (e.g., discussions, group work):

These are rooted in Vygotsky's social constructivism, where learning is enhanced through peer interaction, scaffolding, and application of knowledge.

1.9.2 Mediating Constructs:

1.9.2.1 Engagement Level

Both students' and teachers' engagement are critical to the perceived success of the flipped model

1.9.2.2 Collaboration

Interactive in-class work fosters peer-to-peer learning and enhances social learning outcomes.

1.9.2.3 Technology Use

Access to and familiarity with digital tools affect how students interact with pre-class materials and engage during class (Khurshid, 2020).

1.9.3 Outcomes

1.9.3.1 Students' Perceptions

Measured in terms of engagement, comprehension, and satisfaction.

1.9.3.2 Teachers' Perceptions

Focused on student participation, classroom dynamics, and instructional efficiency.

1.9.3.3 Explanation of Relationship

Pre-class digital resources are expected to increase autonomy and readiness for in-class activities, while in-class interactivity promotes critical thinking and engagement. These, influence student and teacher perceptions of the flipped classroom's effectiveness. Engagement, collaboration and technology use are considered key mediators, as they directly impact how the method is experienced.

CHAPTER 2
LITERATURE REVIEW

The flipped classroom is an important part of blended learning, which mixes traditional teaching with online activities. It is inspired by ideas from constructivist learning theory, which focuses on students actively building their knowledge, rather than just memorizing information given by teachers. This approach is based on Piaget's theories about how people learn and develop mentally. Piaget believed that learners need to interact with their environment to develop their thinking skills and communicate well with others. Constructivist theory, which came after older theories like behaviorism and cognitive theory, suggests that learning is a mental process where students play an active role in making sense of information. In the classroom, this means teachers focus on students as the main source of knowledge, encouraging them to explore, question, and connect ideas on their own. In this approach, students are seen as the most important part of learning—they actively engage and build knowledge, rather than passively receiving information. This idea challenges traditional teaching, where the teacher was the focus. Now, teachers need to adopt this new constructivist approach, aligning with modern teaching methods that put students at the center of the learning process.

The flipped classroom is an important part of blended learning, influenced by constructivist theories like Piaget's cognitive theories and learner-centered approaches. Piaget's theory emphasizes developing students' thinking abilities alongside emotional growth. Constructivist learning focuses on how humans process knowledge and have become a widely used teaching method. This theory values students as active participants in learning, challenging traditional methods that place teachers at the center. Instead, it sees learners as creators of knowledge rather than passive receivers. To align with modern teaching methods, teachers need to adopt constructivist approaches that prioritize student engagement and active learning (Birenbaum, 2003).

2.1 Constructivist Approach

Constructivism is a teaching approach that focuses on helping students actively build their knowledge and skills instead of just memorizing facts. It emphasizes that learning happens when students connect new ideas to what they already know, challenge their previous beliefs, and adapt their thinking. This approach encourages students to generate ideas, analyze critically, and engage deeply with concepts rather

than just gathering information. Teachers play a guiding role, empowering students to explore, question, and solve problems relevant to real life. Collaboration with peers and active participation are key to meaningful learning. Constructivism also highlights the importance of using technology and adapting lesson plans to meet students' needs. However, studies show that some learners and teachers find it challenging to adopt this method. Institutions are encouraged to include constructivist strategies in their curricula to develop independent, curious, and skilled learners who can confidently apply knowledge in various situations (Birenbaum, 2003).

Constructivist principles are pivotal in the flipped classroom model. For instance:

1. Piaget's theory of cognitive development underpins the flipped model's emphasis on self-paced learning through pre-class materials.
2. Vygotsky's social constructivism aligns with in-class collaborative activities that foster peer interaction."

In countries like Pakistan, barriers such as limited access to digital devices, inconsistent internet connectivity, and traditional preferences for teacher-centered learning methods pose challenges to implementing flipped classrooms. Addressing these barriers requires localized solutions, such as low-tech instructional designs or hybrid models combining printed materials with digital content (Zeewaqar, 2024).

2.1.1 Characteristics of Constructivist Learning

1. In constructivist learning, students are the main focus. They take an active role in learning, while teachers guide, collaborate, organize, and encourage moral values rather than simply delivering lessons.
2. The approach emphasizes creating a learning environment where students engage with real-life scenarios, making their learning practical and meaningful.
3. Constructivism values communication and collaboration in the classroom. Students learn by discussing ideas with teachers and peers, sharing opinions, asking questions, and exchanging viewpoints to deepen their understanding.
4. This approach encourages students to think beyond basic needs and aim for continuous learning and improvement, helping them set and achieve higher goals (Xu, 2009).

2.1.2 Constructivist Classroom Environment

Constructivist education focuses on the needs of students and encourages them to actively participate in their learning. Instead of just giving answers, the teacher

creates activities and experiences that allow students to explore, ask questions, make guesses, and solve problems. The teacher acts as a guide to help students through this process. Ahmadi (2008) explains that this method helps students think critically and make their own decisions. It also allows them to use their past experiences to come up with new ideas, make predictions, and test their assumptions. According to Galway et al. (2014) and Walcutt et al. (2011), the main strength of this approach is that it helps students turn theoretical knowledge into practical, useful understanding. Walcutt et al. (2011) argues that constructivist teaching methods are excellent for helping students collaborate, share ideas, and build theoretical knowledge.

In this study, Galway et al. (2014) they used a military task to compare how well the constructivist approach, combined with Cognitive Load Theory (CLT), helps students develop flexible skills. They focused on how well instructional support could help students learn and use knowledge in a computer-based learning environment. The study included 20 men and 58 women as participants. They were taught using methods based on constructivism and CLT. The researchers measured how well the trainees performed by looking at their basic knowledge (declarative knowledge), personal details (biographical information), theoretical understanding, and their decision-making skills. This helped them evaluate how effective the teaching methods were. The study's findings indicate that individuals trained using the Cognitive Load Theory (CLT) approach demonstrated significant proficiency in their tasks. The results suggest that both constructivist methods and CLT are equally effective in enabling learners to successfully complete a variety of tasks. This highlights the potential of both approaches in fostering practical skills and knowledge application, making them valuable strategies in instructional design and teaching.

2.2 Behavioral Approach

Behaviorism is a learning theory that focuses on how the environment shapes behavior. It suggests that people learn through interactions with their surroundings, using two main methods: “classical conditioning” (learning through association) and “operant conditioning” (learning through rewards and punishments). According to behaviorism, learning happens when we see a specific response to an environmental event. For example, if a teacher shows a math problem like "2+4=?" and a student answers "6," the math problem is the “stimulus”, the answer is the “response”, and the connection between the two shows learning. Behaviorism emphasizes creating and strengthening this link through repetition and reinforcement, like rewards or feedback,

which make correct responses more likely in the future. However, behaviorism focuses only on visible actions and performance outcomes, not on the internal thought processes or how students understand or organize knowledge. It views students as reacting to their environment rather than actively engaging in learning (Sntrock, 2017).

According to behaviourism, developed by B.F. Skinner in 1974, learning occurs through conditioning that changes observable behaviour. Key elements of this theory include reinforcement and stimulus-response patterns, as seen in both classical and operant conditioning. In flipped classroom (FC) models, behaviourist principles are reflected in structured activities such as quizzes, tests, and immediate feedback, which help reinforce correct responses.

However, the flipped classroom approach goes beyond behaviourism by promoting critical thinking, internal motivation, and collaborative knowledge-building. While behaviourist strategies, such as Gamified quizzes, can support learning through reinforcement, they are not sufficient on their own to develop higher-order skills like self-reflection and teamwork, which are essential goals of the flipped classroom model. (Macleod, 2025)

2.3 Cognitive Approach

Cognitive theories focus on how students learn, process, and store information in their minds. Instead of just looking at what students do, these theories explore how they think, understand, and organize knowledge. Learning is seen as a mental process where students actively engage in understanding and managing information. Key ideas related to teaching based on cognitive theories include:

1. Students take an active role in learning by controlling their progress, reflecting on their thinking, and adjusting their strategies (like planning, monitoring, and reviewing their work).
2. Teaching helps students break down tasks into steps to understand and make connections between ideas.
3. Lessons are design to help students' process information effectively using tools like outlines, summaries, or diagrams.
4. Learning activities remind students of what they already know and provide examples to help them connect innovative ideas with past knowledge.

This approach encourages students to take charge of their learning while developing deeper understanding and critical thinking skills (Aljaraideh, 2019)**.**

2.3.1 Cognitive Approach in Teaching

Peggy (2013) explains that the cognitive approach to teaching focuses on helping students connect new information to what they already know. This helps them understand and remember new ideas more effectively. The cognitive approach also supports using methods like practice exercises, memorization of facts, and different learning strategies to help students learn. For example, when students are asked to explain new ideas in their own words, it helps them think deeply and understand better. In this approach, students are encouraged to be active learners, and learning is mostly driven by their own motivation.

2.3.2 Zone of Proximal Development

The "Zone of Proximal Development" (ZPD) is a theory developed by Lev Vygotsky (1896–1934). It refers to the gap between what a student can do on their own and what they can do with help from others. Vygotsky believed that learning happens best when students get support to do tasks slightly beyond their current ability. He also emphasized that learning is a social process. Students build knowledge by combining their thinking skills with the help they receive from others, shaped by their culture and background. This idea shows how both social interaction and personal effort are important in learning. (santrock, 2006)

2.3.3 Codes of Vygotsky's theory

Lev Vygotsky (1896–1934) developed the concept of the "Zone of Proximal Development" (ZPD), which is part of the constructivist approach to learning. ZPD is the gap between what a student can do by themselves and what they can do with help from others. Vygotsky believed that social interaction plays an important role in how students learn and think. He explained that students build knowledge by using both their thinking abilities and support from their social and cultural surroundings. In the ZPD, students need help from someone more knowledgeable, known as the "More Knowledgeable Other" (MKO), such as a teacher, peer, or mentor. The MKO provides support—called "scaffolding"—to help students understand new ideas. As students become more confident and skilled, the MKO gradually reduces the support. This allows students to work more independently and move on to more advanced learning tasks. In this way, students grow and reach higher levels of understanding.

2.3.4 Scaffolding

Scaffolding is a teaching strategy that is closely related to the idea of cognitive apprenticeship and is based on Vygotsky's constructivist theory. It involves support

from a More Knowledgeable Other (MKO), such as a teacher or peer, who helps a student understand a concept or skill. As the student improves and becomes more confident, the MKO slowly reduces the support, allowing the student to work on their own.

When used effectively in the classroom, scaffolding helps students learn without making them dependent on the teacher. Teachers should give students tasks that are just beyond their current ability—things they can do only with help. Teachers also need to create a supportive environment where students feel safe to take on challenges, and guide them so they can eventually complete difficult tasks independently in the future. (bibi, 2011)

2.4 Concept of Instructional Technology

In today's world, problem-solving and critical thinking are essential skills for success, and integrating information and communication technology (ICT) into education is considered the best way to develop these skills. ICT also makes it easier to assess these skills. However, for students to develop higher-level thinking skills, they need access to computers in the classroom (Tuck, 2004), which can create a better learning environment. According to Sinclair (2009), using ICT effectively improves both students' academic performance and teachers' skills. Incorporating ICT in teaching encourages teamwork and helps students improve their decision-making and social skills (Aljaraideh, 2019).

While face-to-face learning can't be exactly recreated, technology can help simulate it. Yelland (2001) suggests that traditional teaching methods often make it hard to fully use technology in the classroom, which prevents creating a tech-rich learning environment. Classrooms can be set up in new ways to encourage students to take responsibility for their learning and stay actively involved. One approach that works well in this context is the flipped classroom. In a flipped classroom, learning shifts from being focused on the teacher to being centered on the students. It combines online lessons with in-class activities and encourages students to work together and learn through collaboration.

Flipped classrooms are a new idea, introduced by Bergman and Sam at Woodland Park High School in 2007. Since then, technology has played an increasingly important role in education. According to Novick (2014), the flipped classroom allows for many ways to share information. It's important to note that flipped classrooms and flipped learning are different. Bright explains that flipped learning focuses on shifting

from group learning to more individual learning with direct instruction. In a flipped classroom, homework and classwork are combined, so students spend class time applying and practicing concepts they've already learned at home. The flipped classroom is often compared to online, distance, and blended learning because all of them use videos as a teaching tool. However, they are not the same, and there are differences. In online education, students and teachers don't interact face-to-face at all. Blended learning combines online activities with in-person classroom time, where students and teachers interact directly (Aljaraideh, 2019).

The flipped classroom is a teaching method where students learn new concepts at home through videos or reading, allowing more interactive activities during class time. This approach can be especially helpful when students miss classes due to illness or family issues, as they can catch up in their own time. Additionally, it is beneficial for students who find certain topics confusing or unclear, as they can revisit the materials as needed to better understand the content. The idea was pioneered by Jonathan Bergmann and Aaron Sams, who created educational videos to help their students grasp new concepts and clarify any misunderstandings, making learning more engaging and relevant by connecting it to real-life situations.

Flipped learning can be categorized into three main types. The first is the Traditional flip, where students watch videos at home to grasp the basic concepts of their new lessons. Then, classroom time is focused on developing critical thinking, creativity, and critical thinking skills. The second type is the In-class flip, which is like the traditional approach but with a twist: students watch the videos in class and then collaborate, share ideas, and work on tasks together. Finally, there is the Mastery flip, where students work at their own pace either individually or in small groups. Teachers assess students' understanding as they go along, and students show what they have learned through tests or assignments. If students struggle with any concepts, extra help or remedial sessions are provided to ensure they fully grasp the material (Aljaraideh, 2019).

2.5 Flipped Classroom

A class that is reversed is referred to as the inverted classroom. What is typically done in the classroom is now done at home, and what is done at home is now done in class, according to the flipped classroom concept. When students participate more actively in class activities than the teacher, it's often referred to as a student-centered

approach to learning. Here, the instructor serves as a facilitator, encouraging, directing, and providing feedback on the work of the students (Hadiyanto, 2023).

In a flipped classroom, students focus on activities that build higher-level thinking skills, like applying knowledge, analyzing information, evaluating ideas, and creating new concepts. This approach recognizes that students learn at different levels of independence and shifts the focus from passive listening to active participation. It aligns with Bloom's revised taxonomy, which outlines six stages of learning: “remembering” (recalling facts), “understanding” (grasping meaning), “applying” (using knowledge in real situations), “analyzing” (breaking down information to see relationships), “evaluating” (judging based on criteria), and “creating” (building something new). The flipped classroom helps students progress through these stages, emphasizing deeper learning and critical thinking.

Teachers can help students learn better by giving them more time to understand and use the material they study. They can create activities like group projects or research tasks that focus on active, student-centered learning. During class, teachers can check how well each student understands the material and offer extra help if needed. They can also give personalized feedback and guidance to help students improve and succeed in mastering the content (Hadiyanto, 2023).

The flipped classroom has gained popularity because it shifts the emphasis away from traditional teaching methods and toward a more interactive, student-centered approach. In this model, what was formerly done in class, such as lectures, is now completed at home via videos or texts. Meanwhile, things that were formerly done at home, such as homework, are now completed in class with assistance from the teacher. This approach is also consistent with the concept of just-in-time teaching, in which students are given preparatory work, such as questions to ponder, before attending class. This motivates them to think critically about the material, and throughout class time, discussions and activities are focused on these questions to deepen understanding and engage students actively in the learning process.

According to Bishop and Verleger 2022, a flipped classroom involves students watching video lectures or completing computer-based activities at home before class. Then, when they come to class, the focus shifts to interactive and group-based learning activities. Bishop and Verleger emphasize that the pre-class activities should be computer-based, like videos, and not traditional textbooks or tests. On the other hand, hung views the flipped classroom as a modern teaching method that uses technology to

enhance learning. In this approach, the pre-class assignments can vary and may include self-made or pre-existing videos, quizzes based on readings, or worksheets to help students prepare for the in-class activities (li & li, 2022).

Herreid and Schiller (2013) explain that flipped classrooms create more opportunities for students to actively engage in learning. Instead of passively listening to lectures, students participate in activities that are more hands-on and interactive, which helps them understand better. Flipped classrooms also make it easier to focus on the specific needs of students, as teachers can spend class time addressing questions or difficulties students face after reviewing the material beforehand. Restard (2013) adds that this approach makes students more responsible for their learning. Since they need to prepare before class by watching videos or reading, they take an active role in their education. During class, the teacher is present to provide immediate help, feedback, and guidance while students work on applying what they've learned. In a study conducted by John (2016), secondary school science teachers shared their views on flipped classrooms. They pointed out that this method significantly improves how students learn science and can be beneficial for other subjects too. By using this approach, students get the chance to understand concepts more deeply and practice applying their knowledge with the support of their teacher.

The flipped classroom is not always the best fit for every situation. For example, it might work for some lessons in lower elementary grades but not for teaching the entire class this way. One challenge is that it requires students to prepare before class, which can be a heavy responsibility, especially for younger learners. Research shows that the flipped classroom approach is being used in schools and universities worldwide.
However, in Pakistan, it's still a relatively new idea. Most of the research in Pakistan focuses on its use in universities, not schools. Studies mainly look at how flipped classrooms affect students' academic performance, showing that it has been applied more in higher education than in earlier levels of schooling (Khurshid, 2020).

The flipped classroom (FC) is a teaching approach that focuses on making class time more interactive and engaging for students. It encourages students to take an active role in learning by participating in activities, asking questions, and working with peers, teachers, and course materials. This approach helps students think critically and independently, preparing them for lifelong learning and their future careers. The FC uses technology to help students learn before class, like watching videos or reading materials, so they are ready for in-class activities. During class, students engage in

discussions, problem-solving, and hands-on tasks, making the most of their time with the teacher. One great feature of the FC is that it can be adapted to fit different students' needs. Teachers can use it for a single lesson, a part of the curriculum, or even the entire course. It is also flexible and can be scaled up to accommodate larger groups or different subjects, making it a versatile and modern way to teach and learn (Divjak, 2022).

2.6 Working Principle of Flipped Classroom

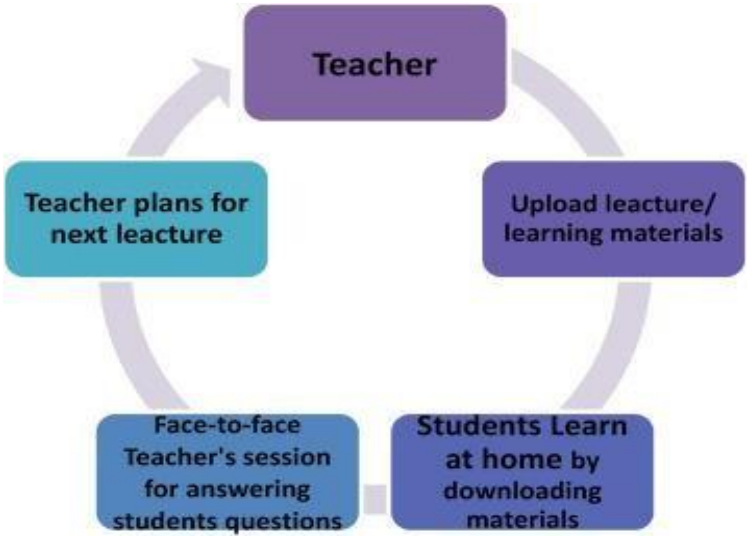
The flipped classroom aims to make learning more active and engaging for students by giving them more opportunities to practice and apply what they've learned. Instead of passively listening to lectures, students first study the material on their own, often online, in what is called the "individual learning space." Then, during class time, which is the "interactive learning space," they work on activities, solve problems, and collaborate with peers and teachers. According to Long et al. (2016), the flipped classroom can be implemented in many different settings, not just traditional lecture halls. It can take place in technology-enhanced classrooms, studios, labs, computer rooms, meeting spaces, outdoor environments, or even fully online. This flexibility allows the flipped classroom to adapt to different teaching needs and learning environments. The University of Hong Kong's (HKU) flipped classroom professional development series proposed a few steps to integrate these two educational approaches that are:

1. Online learning space
2. Face to Face learning space

The flipped classroom's primary method is to arrange two tasks consecutively as shown in figure.

Figure 2.6

Flipped Classroom Activities



(Zainuddin, 2015)

2.6.1 Online Learning Space

Before in-person classes, teachers share lecture materials, like videos or readings, with students online. Students review these materials on their own to understand the content. While studying, they should note any topics or concepts they find confusing. During the in-person class, they can then ask the teacher questions and clarify their doubts, making the most of the class time for better understanding.

2.6.2 Face to Face Learning Space

During in-person classes, teachers are available to help students and answer their questions. Any confusion students had while learning on their own can be discuss and clarified during class. Teachers will keep explaining and answering questions until all students understand the material (Khan, 2021).

2.7 The Effectiveness of Flipped Classroom

All this research concluded that Flipped Learning (FL) performs well. Enfield (2013) discovered that FL boosted pupils' confidence in themselves. Multimedia students at California State University reported that FL helps them learn better.

Ceylaner and Karakuş (2018) discovered that FL assisted ninth graders prepare to acquire language independently. According to Sirakaya and Özdemir, college students benefit from FL in terms of grades, motivation, and independent learning. Hava (2021) discovered that FL increased participation and improved learning outcomes among Turkish university students. Someone discovered that thinking tools available online aided future teachers in Florida. Güvenç (2018) discovered that FL helps students learn

better, be more engaged, motivated, identify their learning type, and take control of their learning. Strayer (2012) found students like FL because it's fun and works for different kinds of learners. FL also helps students think better in class. But FL might be hard if students don't like it or the videos aren't good. Ngo and Yunus think FL is a good way to teach in the future. The research presented multiple studies showcasing the effectiveness of Flipped Learning (FL). For instance, it highlighted how FL boosts student achievement, promotes active learning, and enhances motivation. FL also supports teachers in understanding students' learning styles and challenges. However, challenges like student resistance and video quality need consideration. Effective FL components include professional educators, adaptable learning cultures, intentional content delivery, and flexible environments. FL also fosters self-regulated learning abilities, empowering students to direct their own learning. Overall, FL emerges as a promising educational method for the 21st century, but its implementation requires careful consideration of various factors to ensure its effectiveness (Eunjeong, 2022).

2.8 Flipped Classroom Opportunities

The flipped classroom provides several benefits for teachers. It allows them to use their expertise more effectively by focusing on helping students during class rather than lecturing. It also makes it easier to teach larger groups of students because instructional materials, like videos or reading, can be shared with everyone online.

From the instructor’s perspective, key opportunities of the flipped classroom include:

1. Teachers can use class time more effectively by focusing on discussions, explaining complex topics, and working closely with students in small groups or one-on-one.
2. Students can review basic concepts through online lectures, reducing the need for teachers to repeat the same answers in class.
3. Recorded lectures can be reused for different class sections, saving time and making it easy to update the material each year.
4. Teachers can quickly adjust or add new lecture content to address changing learning needs.
5. Students benefit from recorded lectures as they help improve understanding, exam preparation, and overall performance.
6. Videos and screen captures explaining key ideas are very popular among students, who appreciate having both video and text resources available for their learning. (Elazab, 2015)

2.9 Components of Flipped Learning

Flipped learning network (2014) suggested main components as given below:

2.9.1 Flexible Environment

Creating a flexible environment allows learners to learn at their own speed, when and where they want. This involves promoting students' learning from many viewpoints, setting time and space frameworks, and adjusting as needed.

2.9.2 Learning Culture

Flipped learning involves a learner-centered approach for instruction. During class, assignments, discussions, problem-solving, and other activities related to the course material are completed. Learner-centered activities are being carried out in the classroom by the students. The teacher can provide feedback to students in the classroom. The active learning technique is used in flipped classrooms to organize and set up a learning environment that involves students in class activities and gives the material significance for them.

2.9.3 Intentional Content

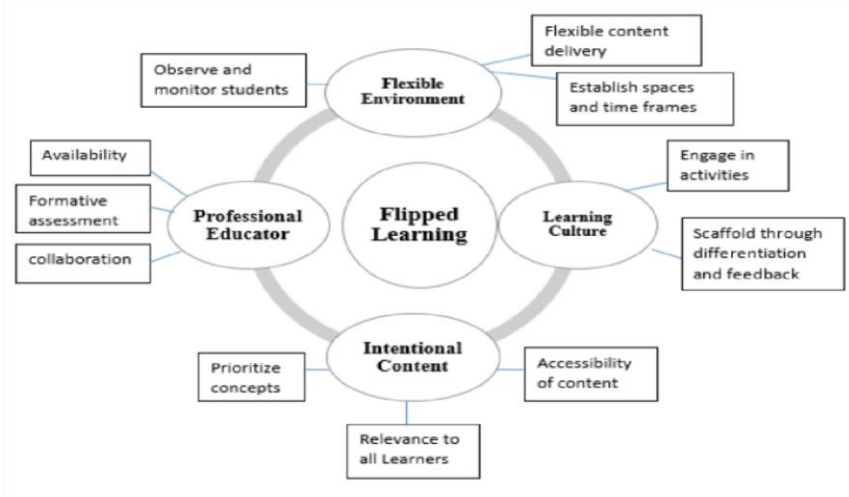
The goal of flipped learning is to increase students' comprehension of ideas and methods by letting them research the subject independently. During class, a learner centered strategy is implemented based on the course's objectives and educational level.

2.9.4 Professional Educator

An important and accountable position is held by professional educators in flipped classrooms. Throughout class, the instructor watches, mentors, and evaluates the students. Students can receive comments from their teachers individually, in groups, or as a class. Ongoing formative assessment during class time can provide feedback to improve future instruction (Tufail, 2015).

Figure 2.9.4

Components of Flipped Learning



(Alharbi, 2015)

2.10 Flipped Classroom Principles

Following are the principles of flipped learning strategy

2.10.1 Flipped Classroom Principle 1

It is abbreviated as FCP1, this idea is applied to assignments that students complete outside of class to promote reflection and get a response.

2.10.2 Flipped Classroom Principle 2

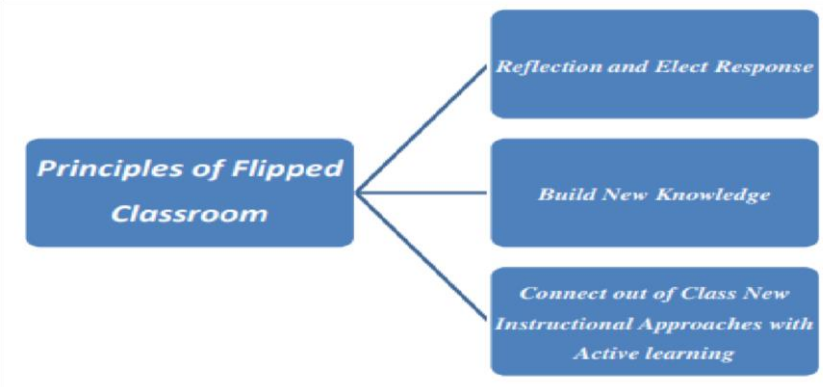
It is known as FCP2, and as a member of a learning community, it is applied to in-class assignments to develop new knowledge.

2.10.3 Flipped Classroom Principle 3

This idea, which goes by the abbreviation FCP3, links in-class and out-of-class assignments by employing the same teaching strategy (Minaz, 2018).

Figure 2.10.3

Flipped Classroom Principle



(Hung, 2015)

2.11 Flipped Classroom Models

The flipped classroom concept can be implemented using a variety of models. The outcomes will be more effective if the class conditions are considered when selecting these models.

2.11.1 Traditional Flipped Classroom Model

The classic flipped classroom model was defined as "what is done at school, homework done at home completed in class" by Bergmann (2012). In a typical flipped classroom, students view the lecture from the previous evening before class. The lesson starts with short questions and answers. If any lecture material is unclear, it is thoroughly clarified. During the remaining time, the instructor designs inquiry-based activities and provides students with one-on-one assistance. With this type of class structure, the teacher never teaches the material directly; instead, the lessons are always provided in lecture video format outside of class time. As a result, students have the chance to learn through discussion. This method involves having a student-centered class instead of a teacher-centered one, with the teacher serving just as an advisor. The flipped classroom technique involves rearranging the timetable. However, under a traditional approach, most of the course time is spent on subject instruction.

2.11.2 Partial Flipped Classroom Approach Model

A more adaptable variation of the traditional flipped classroom strategy is the partial flipped classroom concept, which Murray Hill Secondary School's Gwyneth Jones is using to demonstrate. Jones did not penalize students who could not or did not watch instructional videos outside of class for a variety of reasons, such as lack of equipment access. Although Jones called this approach a "flipped classroom," in reality, it is more in line with the traditional paradigm, in which students are given the option to interact with recorded lectures at their own pace when they are given homework.

2.11.3 Holistic Flipped Classroom Model

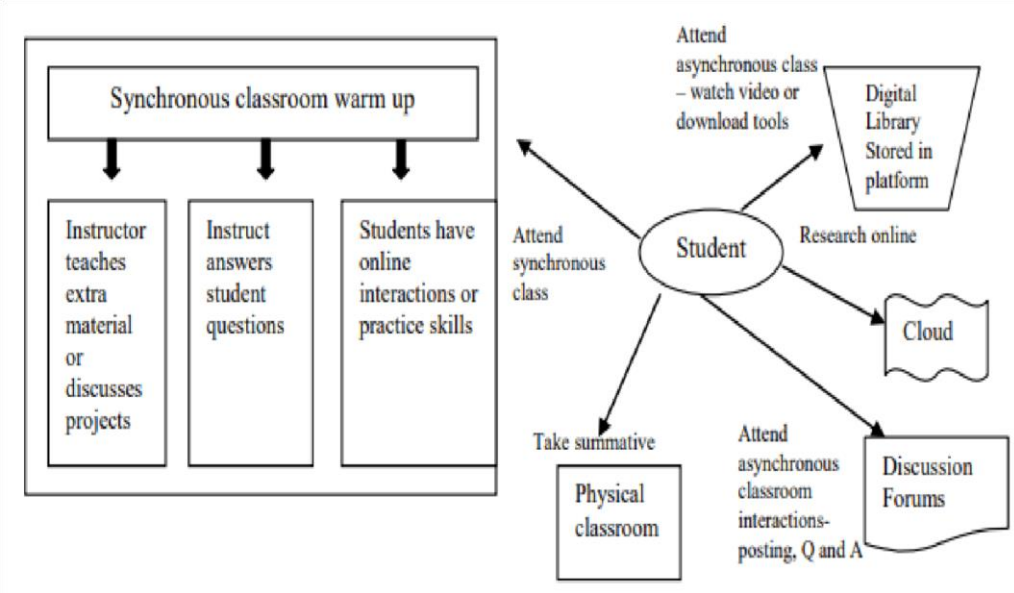
Chen et al. (2014) introduced a new model called the Holistic Flipped Classroom (HFC), which adds three key elements—Progressive Activities, Engaging Experiences, and Diversified Platforms—to the traditional flipped classroom approach. The HFC model combines learning at home, on mobile devices, and in physical classrooms, all working together at the same time. Unlike traditional flipped classrooms, where students' activities at home are not monitored, in the HFC model, every learning space is treated like a classroom. This means all activities are supported, monitored, and recorded.

In the HFC, students log in to an online platform to preview or review lessons, participate in live class sessions, discuss content with their teacher and classmates, and reflect on what they've learned. All their activities are recorded in the platform's system. Before each live class, students can complete lessons and review materials using mobile devices or cloud-based tools. For live class sessions, students log in to the platform and participate in real-time activities under the instructor's guidance. These activities might include doing research online, uploading assignments to the platform, or taking quizzes—all within a fully connected and monitored learning environment (Ozdamli & Aşıksoy, 2016).

This study integrates a holistic approach to the flipped classroom model, considering not only academic outcomes but also engagement and teacher support as part of comprehensive evaluation.

Figure 2.11.3

Holistic Flipped Classroom Model



(Ozdamli, 2016)

2.12 Pre Class-Activities of Flipped Classroom

In a flipped classroom, students take responsibility for learning before they come to class. This approach focuses on getting students ready to participate actively during class. Instead of just watching video lectures, they complete specific pre-class activities that prepare them for in-class learning. Pre-class preparation includes:

1. Students might read articles, chapters from textbooks, or other resources to understand the topic.

2. They might watch short videos, listen to podcasts, or explore demonstrations and simulations online to learn key concepts.
3. Universities often use online systems (called Learning Management Systems or LMS) to organize and share these materials with students. These systems make it easy for students to access everything they need to prepare for class.

This method helps students come to class ready to participate in hands-on activities, discussions, or problem-solving exercises (Minaz, 2018).

2.13 During Class Strategies for Flipped Classroom

The following are the major flipped classroom strategies:

2.13.1 Learning Environment

A learning environment is more than just a classroom; it includes the physical space where learning happens and the cultural or educational setting that shapes how teaching and learning take place. It reflects the values, beliefs, and approaches of the educational system, as well as the relationships and interactions within it. The environment is influenced by the local culture, the people involved, and the institution's attitudes, work ethics, and ways of thinking. It also includes the teaching styles, methods, and the way teachers and students interact, as well as the physical setup of the space where learning occurs. In short, a learning environment combines both the place and the overall atmosphere that supports and guides the learning process (Gijbels, 2010).

2.13.2 Active Learning

"Student-centered" learning means focusing on students being active participants in their education. In active learning, students learn by doing and observing rather than just listening to the teacher. It helps them build skills, knowledge, and the right attitude. This method often uses technology, like videos or interactive tools, to make learning more engaging. Instead of the teacher leading everything, students take charge of their own learning. They stay actively involved by writing, reading, discussing, and completing various activities. A key part of this approach is that students also think about how well they performed these tasks, helping them improve and teach more effectively (Butt, 2014).

2.13.3 Brainstorming

In classroom, students are given a short time (like one minute) to write down their ideas about a specific topic. Then, these ideas are shared, written on the board, or displayed for everyone to see. The ideas are analyzed, grouped into similar or related

categories, and discussed as a class. This approach helps students develop important skills like thinking deeply about a topic, being creative, and solving problems. It's often used to explore difficult subjects or brainstorm different ideas about a situation. It encourages students to think critically and work together to understand and solve challenges (Mangal, 2011).

2.13.4 Gallery Walk

Students get to walk around and look at posters, artwork, and other projects created by their classmates or groups. During this activity, they can share their thoughts and give creative names to the objects they see.

2.13.5 Graffiti Wall

Before class, students also write their ideas, feelings, or expressions on a "graffiti wall" in the classroom. This wall acts as a shared space for everyone to contribute, and they sign their names next to their messages (Ahmad, 2016).

2.13.6 Active Lecturing

In today's technology-driven world, lectures are often made more interactive to keep students engaged. Instead of just listening, students become active participants. For example, during a short lecture, the teacher might ask students to write down unclear ideas or tough points for a minute. Then, students discuss these with classmates and ask questions. This approach makes lectures more interesting, thought-provoking, and engaging compared to traditional ones.

2.13.7 Ambassadors

This is a method where students share and discuss ideas with their peers. In this activity, two or more students move between different groups to share knowledge or talk about a topic. It's a great way to explore unclear ideas and discuss them in a supportive, low-pressure environment (Petrina, 2007).

2.13.8 Group Work

Killen (2005) suggests that individuals who are eager to contribute to a shared learning experience play an important role in fostering a positive and effective learning environment. These individuals actively engage in collaborative efforts, demonstrating self-awareness and the ability to communicate effectively within a group. Through this process, they develop skills in teamwork and collective learning, which allow them to represent ideas clearly and supportively. This approach also promotes the growth of social and ethical values, helping to build strong moral character. By working

collaboratively and upholding high standards of behavior, these individuals create an atmosphere that encourages mutual respect, personal growth, and academic success. Their actions and attitudes contribute to a supportive learning community where everyone benefits (Caruso, 2008).

2.13.9 Think-Pair and Share

Think-Pair-Share is a group activity that helps students of all ages and class sizes participate and learn actively. First, students think about a question or topic on their own. Then, they pair up to discuss their thoughts with a partner. Afterward, they share their ideas with the whole class or a larger group. This method has many benefits in an active learning setting. It gives students a chance to practice using language in a meaningful way, feel comfortable sharing their ideas, and build confidence in their abilities. It also improves communication skills, helps students organize their thoughts, and supports mental processes needed for learning. Overall, it's a great way to make learning interactive and effective (Solomon, 2024).

2.13.10 Poster Session

In this activity, students are given a specific topic and asked to create posters that include colorful and creative elements. They then present their posters, focusing on the key points of their topic. This activity often happens alongside a "gallery walk," where students can view and learn from each other's work. This approach helps students improve their learning and presentation skills in a fun and engaging way, all within a short period of time.

2.13.11 Collaborative Learning

In this activity, small groups of 3 to 6 students are formed to solve problems and make decisions together. Each group is asked to answer a question on behalf of the entire class. CL combines reviewing what has already been learned with active participation. To make this work well, the classroom should be organized to allow students to easily form small groups and work together. The setup also ensures that both individual and group abilities are supported, helping everyone contribute and learn effectively. This approach encourages teamwork, critical thinking, and applying knowledge to real-world problems (Bens, 2017).

2.13.12 Readers Theater

Oral illustrations are used to help students hear how difficult words are pronounced. This is done during group reading activities, which can also include acting

out or reading passages aloud. These activities make learning fun and improve students' reading and thinking skills (Westwood, 2008).

2.13.13 KWL

Another useful method is the KWL strategy, which stands for What I Know, What I Want to know, and What I Learned. This helps students review what they already understand, figure out what they want to learn, and reflect on what they've learned afterward. It's a simple and organized way for students to track their progress, focus on their interests, and share their knowledge as they continue learning.

2.13.14 Text-Against-Text

The text-against-text technique helps students explore and compare ideas by studying two different documents. They look for differences or similarities between what's in the textbook and new information or concepts from another source. Sometimes, students may find it hard to accept conflicting ideas, but this method shows that topics can have different viewpoints or multiple explanations. To use this strategy, the teacher can divide the class into groups and have them discuss and debate the content of the texts. This helps students think critically about the material and understand the difference between scholarly sources (written by experts, like university professors) and non-scholarly ones. It encourages deeper learning and better evaluation of information (Killon, 2007).

2.14 Role of Student and Teacher

The student-centered approach shifts the focus of learning from the teacher to the student, where the teacher takes on a more supportive, passive role, and the student becomes an active, independent learner. In this method, students take responsibility for their learning, fostering engagement and accountability. The flipped classroom is a prime example of a student-centered learning model, promoting active participation and interaction, which aligns with constructivist principles. This approach contrasts with traditional lecture-based teaching, which can cause students to lose interest over time. By emphasizing a student-centered approach, teachers can create a more engaging and effective learning environment, enhancing students' motivation and understanding (Qaisar, 2019).

Flipped classrooms and traditional classrooms work differently. In a flipped classroom, the teacher's role is to guide and support students as they learn. The teacher focuses on creating a student-centered learning environment by designing a framework

that helps students succeed with the flipped model. The teacher manages all the tools and technology needed, organizes homework, and provides clear instructions. It's also the teacher's responsibility to prepare and share high-quality videos and learning materials before class. Students watch these videos at home or before class (first half) to learn the basics, and then they use the class time (second half) to discuss their ideas and engage in interactive activities (Qaisar, 2019).

In a flipped classroom, the teacher organizes both in-class and out-of-class activities, so they work together smoothly to help students learn. The teacher encourages students to find additional videos or resources online to deepen their understanding of the topic. If needed, the teacher also helps students access the right materials.

During class, the teacher motivates students to take part in discussions and other activities. To make discussions easier, the classroom is often arranged in a half-circle. The teacher works with students in small groups and adjusts group activities to meet individual learning needs, ensuring every student gets the support they need. The researcher reversed twenty sessions to evaluate the effectiveness of the flipped classroom model and gather evidence of its impact on students.

A quiz is an essential formative assessment tool in flipped classroom settings, as it helps assess students' understanding of the material studied outside the classroom. Additionally, questioning plays a significant role in the flipped classroom model, particularly following debriefing sessions. These questions should be well-structured, focused, and exploratory, encouraging students to engage in higher-order thinking. By ensuring that the questions are aligned with the content and designed to promote critical analysis, the flipped classroom approach can effectively enhance student comprehension and learning outcomes (Qaisar, 2019).

2.15 Advantages of Flipped Classroom

The flipped classroom approach has several benefits:

1. Students take responsibility for their learning and can study at their own pace, giving them more control over their progress.
2. Students play a central role in learning, working under the teacher's guidance while collaborating and communicating with classmates.
3. Class materials are easily accessible online, so students and parents can review them anytime. This helps students catch up if they miss class due to illness or other commitments.

4. Since students spend less time on traditional homework, the overall learning process becomes more efficient, saving time for both teachers and students.
5. Students get help from the teacher with challenging assignments that require advanced thinking skills. Some researchers argue that this approach may reduce opportunities for students to think critically on their own.
6. Teachers have more time in class to work with students individually.
7. Teachers can adjust teaching methods to match each student's learning speed and style.
8. The emphasis is on helping students learn, rather than just delivering lessons.
9. Teachers can choose to flip specific lessons or even an entire course, depending on their needs.
10. This approach encourages better connections between students and between teachers and students, fostering a supportive learning environment (sytovich, 2019).
11. Students can access learning materials before class, giving them time to explore the content before the actual lesson.
12. This approach allows students to prepare thoroughly for the class by reviewing topics in advance.
13. Students get enough time during class to experiment, practice, and evaluate concepts, leading to a deeper understanding. It also helps improve their critical thinking and higher-order thinking skills (HOTS).
14. The flipped classroom provides more opportunities and tools for students to build their knowledge and comprehension of the subject.
15. Teachers can design activities that enhance students' understanding and overall knowledge.
16. It's a great strategy for teaching students in the 21st century, as it uses technology effectively.
17. Improved Interaction between
    - Teachers and students can have more meaningful discussions.
    - Students can interact and collaborate better with each other.
    - Classroom time becomes more focused, reducing distractions and improving learning.
    - Students are encouraged to actively participate, which leads to better learning outcomes.

2.16 Limitations of Flipped Classroom

The flipped classroom approach has several drawbacks:

1. It is not certain that every pupil will review the required readings at home.
2. Teachers need to spend more time preparing lessons and creating videos.
3. Students might spend too much time using computers
4. This method may not directly prepare students for passing traditional tests.
5. A computer, internet, and other tools are required, which might not be available to everyone.
6. Parents need to understand how this new teaching method works.
7. There's a concern that the teacher's role may feel less important, and computers could take over teaching.
8. This method can be expensive due to the need for technology and resources (sytovich, 2019).

2.17 Global vs. Local Implementation of the Flipped Classroom

In developed countries, the FC model has been widely adopted, particularly in higher education institutions with strong digital ecosystems and pedagogical flexibility. Herreid and Schiller (2013**)** report that U.S. institutions using FC in STEM courses experienced significantly improved student performance and deeper conceptual understanding. Similarly, Bishop and Verleger (2022) argue that students in Western universities generally respond positively to FC due to the self-directed, autonomous nature of the learning process, supported by reliable access to learning management systems (LMS), online resources, and video-based lectures.

Moreover, studies from countries such as the Netherlands, Canada, and Australia (e.g., O'Flaherty & Phillips, 2015) reveal that the FC model fosters enhanced student engagement, time-on-task, and accountability. Students in these contexts are typically more accustomed to independent learning environments, and teachers are trained to facilitate active learning rather than just deliver content.

These global experiences point to a high degree of institutional support, including:

- Digital content creation tools and media labs
- Faculty training in instructional design
- Student orientation for digital literacy
- Seamless integration of asynchronous and synchronous learning

Such infrastructure enables the FC model to function not merely as a technological solution, but as a pedagogical innovation aligned with constructivist and cognitive learning theories**.**

In contrast, FC implementation in Pakistan and similar developing contexts presents a different reality. Khurshid (2020) conducted a study across several public universities and found that while students were theoretically interested in FC, limited access to devices, unreliable internet, and a lack of institutional LMS often made pre-class preparation unfeasible. Teachers also reported difficulty in shifting from didactic instruction to facilitative roles, primarily due to insufficient professional development and a lack of administrative support.

Qaisar (2019) found that when instructors in Pakistan provided clear guidance, structured tasks, and in-class scaffolding, students became more motivated and engaged. However, this motivation was conditional—dependent on teacher effort and not inherently embedded in the system. These studies emphasize that the success of FC in Pakistan is not automatic; it requires systemic adaptations that many institutions have yet to implement.

Moreover**,** cultural expectations of teacher authority and exam-oriented learning environments create additional barriers. Students who are used to passive, lecture-driven learning may initially struggle with the independence and responsibility required by FC. As a result**,** student resistance and poor self-regulation are frequently reported, undermining the potential benefits of the model.\

2.18 Matrix of Key Studies

Author(s)	Context	Key Findings	Implications
Herreid & Schiller (2013)	USA, STEM	Enhanced engagement and critical thinking	Supports active learning in content-heavy fields
Bishop & Verleger (2022)	Global Review	Pre-class design crucial for success	Highlights importance of instructional quality
Khurshid (2020)	Pakistan	Tech and faculty gaps limited FC effectiveness	Institutional support and training needed

Qaisar (2019)	Pakistan	Improved motivation with structured support	Teacher facilitation key to local success
Zainuddin (2015)	Indonesia	Positive outcomes in hybrid settings	Validates adaptability in Southeast Asia

2.19 Critical comparison of Literature Review

The flipped classroom (FC) model has gained global recognition for promoting active, student-centered learning through pre-class content delivery and in-class application. While much of the early literature—such as that by Bergmann and Sams (2012)—established the pedagogical foundations of flipping the classroom, subsequent research has provided nuanced insights into its practical implementation and effectiveness. A critical review of these studies reveals a spectrum of outcomes shaped by educational contexts, technological readiness, instructional design, and learner demographics.

Globally, Herreid and Schiller (2013) argue that flipped classrooms support higher-order thinking by shifting passive lecture time to problem-solving activities, a view supported by Strayer (2012), who found that students in flipped environments reported higher engagement levels. Similarly, Hava (2021) found significant gains in student participation and learning outcomes among university students exposed to flipped strategies. However, while these Western studies celebrate the FC model's potential, they often assume technological competence and access—assumptions that may not hold true in developing regions.

In the South Asian context, findings are more cautious. Khan (2021) observed that in Bangladeshi higher education institutions, although flipped learning supported continuity during the COVID-19 pandemic, challenges such as digital illiteracy and unstable internet infrastructure hindered its effectiveness. Khurshid (2020), examining Pakistani universities, similarly found that while students perceived flipped learning as beneficial for engagement and academic improvement, they struggled with internet access and limited exposure to autonomous learning models. These infrastructural constraints contrast starkly with the technology-integrated settings of Western universities.

A key Pakistani study by Tufail (2015) focused on prospective teachers and reported that flipped instruction significantly enhanced reflective thinking skills. However, the study highlighted that teacher facilitation remained crucial in maintaining student accountability and motivation. Minaz (2018) further emphasized that while the FC model improved performance in Khyber Pakhtunkhwa's teacher education programs, many students required substantial scaffolding and time management support—challenges echoed in the current thesis's findings regarding BS students' reliance on structured guidance.

From a theoretical standpoint, Singh (2020) underscored that constructivist learning principles—commonly linked with flipped learning—are most effective when instructional materials are aligned with learner readiness and cognitive development stages. This idea is reflected in studies like Galway (2014), which advocated differentiated instructional strategies across academic levels. The current thesis builds on this by revealing that MS students, typically more self-directed, adapted more easily to flipped learning than BS students who required structured teacher support.

Furthermore, while Western studies such as those by Li and Li (2022) and Ozdamli & Aşıksoy (2016) stress the role of digital tools in enhancing learner engagement, research in South Asia urges caution. Vitriani (2023) found that vocational students in Indonesia, like many in South Asia, faced difficulties adjusting to independent study without strong teacher guidance and reliable access to learning platforms. These concerns are echoed in the current research, where some students' inability to access digital content before class led to disengagement during in-class tasks.

In summary, although the flipped classroom model is widely praised for promoting learner autonomy, critical thinking, and collaborative engagement, its success is contingent upon local factors including digital infrastructure, cultural attitudes towards self-directed learning, and institutional support. While global literature provides a framework for effective flipped instruction, regional studies, especially from Pakistan, highlight the need for context-sensitive implementations. Future adoption of the FC model in South Asia must prioritize accessibility, differentiated instruction, and teacher training to address the diverse needs of learners.

CHAPTER 3

RESEARCH METHODOLOGY

In Chapter 3, the research methodology was comprehensively detailed, outlining the approach and techniques employed to investigate the study's objectives. This involved selecting a research paradigm and a research design to analyze the perceptions of students and teachers on the effectiveness of flipped teaching at higher education institutions. The methodology also addressed population and sample selection, instrument adaptation, data collection methods, and planned data analysis techniques. Additionally, considerations for ethical conduct throughout the research process are highlighted.

3.1 Research Design

Research design basically provides a defined direction for qualitative, quantitative and mixed method research. It also refers to combinations of different components of research in a logical way to address the research problem (Creswell, 2012).

The research paradigm for this study is constructivism. A mixed-methods approach was employed, with the research design following a sequential explanatory framework. This design consisted of two phases: a quantitative phase followed by a qualitative phase.

3.2 Population of the study

The study population included all students and teachers from the Department of Educational Leadership and Management (ELM) at the International Islamic University, Islamabad. For the quantitative component, the population comprised 559 students, while for the qualitative component, the population included 43 teachers.

Table 3.1

Population of the study

S. no	Department	Teachers	Students	
			BS	MS
1			94	
2			49	
3			93	
4	Educational Leadership		50	
5	and Management	43	125	23
6			38	
7			40	
8			47	
	Total	43	536	23

(Source: Admission Office, IIUI)

3.3 Sample and Sampling Techniques

For the quantitative study, the sample consisted of 473 BS and MS students from the Department of ELM at the International Islamic University Islamabad. A simple random sampling technique was used to select BS students, and a universal sampling technique was used to select MS students to ensure a balanced and unbiased representation of the population. The sample size was determined using Gay (2000) table.

For the qualitative study, the sample included 20 teachers from the Department of ELM. A purposive sampling technique was used to select participants based on their documented use of the Flipped Classroom method in their courses, as recorded in departmental records or self-reports.

Table 3.2

Sample of Study

S. no	Targeted Group		Population	Sample	Sampling Technique
1	Teachers		43	20	Purposive Sampling
2	Students	BS	536	450	Simple Random Sampling
		MS	23	23	Universal Sampling

3.4 Instruments

Two research instruments were used to collect data. A researcher-developed questionnaire for students and a semi-structured interview for teachers.

A self-developed questionnaire followed a systematic approach to ensure its validity and alignment with the study's objectives. Key indicators were identified, including students' perceptions, engagement and participation, use of technology, student responsibility, teacher support, and collaboration among students. To ensure clarity and ease of response, a 5-point Likert scale was used for all items, ranging from 1 = Strongly Disagree to 5 = Strongly Agree**.** This type of scaling was selected because it is widely used in educational research to measure attitudes and perceptions in a structured and understandable manner. Experts reviewed the questionnaire to make sure the questions were clear and covered all key areas. Then, a pilot test was conducted with 24 students to check how well the survey worked. Based on feedback from the experts and the pilot test, improvements were made to ensure the questionnaire was easy to understand. Additionally, reliability testing using Cronbach's alpha showed an overall acceptable reliability score. The final version was used to collect data from 473 students about their experiences with the flipped classroom.

Semi-structured interviews were conducted to gather in-depth opinions, views, and thoughts from teachers. The draft questions were reviewed by subject matter experts to ensure their clarity, relevance, and ability to elicit detailed responses. After incorporating the feedback, the questions were finalized to guide interviews with teachers.

3.5 Procedure (Validity, pilot testing and reliability)

3.5.1 Validity

The validity of the self-developed questionnaire was ensured through expert reviews. Experts in the field of education examined the item to confirm their relevance, clarity and alignment with the study's objectives. The content validity was accessed by evaluating whether items addressing the perceptions of students regarding the flipped classroom model in higher education institutions. The expert suggests some changes like adjustments made to the instruments to improve their validity. Ambiguous questions were rephrased for clarity, redundant items were removed, and additional questions were included to better explore themes such as teacher support, student responsibility, and engagement. The experts confirmed that the instrument was appropriately designed to meet the research objectives and adhered to the general validation criteria.

3.5.2 Pilot testing

The instruments were piloted before implementation of the actual sample of the study to check the reliability of the instruments. 24 students were selected for pilot test from the department of educational leadership and management. Pilot testing was done on the actual population but not included in the sample of this study. The results of the pilot revealed that some items were difficult for students to understand due to the use of technical terms; these items were revised using simpler language. Additionally, items related to student responsibility overlapped conceptually with another item on self-directed learning and was therefore removed to avoid redundancy. These suggestions were incorporated, and minor revisions were made to improve overall readability and ease of response. The average time taken to complete the questionnaire was between 10–12 minutes, which was considered appropriate. After modifications, the revised questionnaire was tested for internal consistency using Cronbach's alpha, yielding a reliability coefficient of 0.86, indicating a high level of reliability. This pilot testing process ensured that the final instrument was both valid and suitable for broader application in the main study.

3.5.3 Reliability

Scale reliability, which measures how consistently a survey or questionnaire captures data, was evaluated using Cronbach's Alpha and item-total correlation values. Cronbach's Alpha is a commonly used statistical measure where a value of 0.6 or higher indicates that the scale is reliable enough for use. To interpret the reliability scores,

George and Mallery (2002) provided the following guidelines: a value above 0.9 is considered excellent, above 0.8 is good, above 0.7 is acceptable, above 0.6 is questionable, above 0.5 is poor, and below 0.5 is unacceptable. These help to determine whether the scale provides consistent and credible results.

The Cronbach's alpha was used for reliability.

Table 3.3

Reliability

Indicator	No of Statements	Cronbach's Alpha
Perception	8	0.719
Engagement and Participation	5	0.856
Use of Technology	9	0.703
Students' Responsibility	6	0.834
Teacher Support	5	0.774
Collaboration	7	0.860
	40	0.8

3.6 Data Collection

The data were collected through personal visits made by the researcher to the selected sample. Before data collection, the researcher provided instructions to the students about the flipped classroom to ensure a better understanding of the concept. After collecting the data from the students, the researcher conducted semi-structured interviews with teachers. The average duration of each interview was approximately 20 minutes. A recorder in cell phone was used to collect data during interviews with teachers.

3.7 Data Analysis

Quantitative data were analyzed using descriptive statistics (mean scores, percentages) to identify trends and inferential statistics (t-tests) to compare perceptions between BS and MS students. Qualitative data from interviews will undergo thematic analysis to identify recurring themes and unique insights.

3.8 Ethical Consideration

Ethical considerations for this study involved several important steps to protect the participants and ensure the research is done responsibly. Participants were asked for their permission through informed consent, and their personal information was kept private and anonymous. Their rights were respected throughout the study.

The researchers were honest and accurate in all aspects of the study and avoided personal bias. Data collected during the research was stored securely and shared only with people who are allowed to access it. Participants were informed about the study's purpose, confidentiality measures, and their right to withdraw at any time. All data were anonyms to protect participant identity. Following these ethical guidelines helped ensure the study was fair, protected participants, and contributed valuable knowledge about green leadership and sustainable development.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

This chapter deals with data analysis and its interpretation of data collected from a sample of 473 students and 20 teachers from the department of educational leadership and management. The data obtained from this study were statistically analyzed and various statistical measures were applied to answer the research questions. This chapter is divided into three sections:

Section I- Descriptive Study

Section II- Inferential Statistics

Section III- Thematic Analysis

For descriptive statistics, mean scores were used to analyze data. The respondents' data on Flipped classroom was analyzed through mean scores. For interpretation of mean scores, the criteria are given below

Scale	Value	Range of mean score
Strongly Disagree	1	1.00 to 1.80
Disagree	2	1.81 to 2.60
Neutral	3	2.61 to 3.40
Agree	4	3.41 to 4.20
Strongly Agree	5	4.21 to 5.00

(Sözen & Güven, 2019)

Inferential statistics (independent sample t-test) were employed to compare the perception of BS and MS students regarding the use of flipped classroom. Thematic analyses were employed to identify teachers' perceptions regarding effectiveness of the flipped classroom in higher education institutions.

4.1 Section I- Descriptive Study

Objective 1: To find out student's perceptions regarding the effectiveness of the flipped classroom in higher education institutions.

Table 4.1

Student's Perception

Statements	N	Mean
The flipped classroom method is more engaging than traditional lectures.	473	3.93
The flipped classroom model allows me to better understand the course material.	473	3.77
I prefer watching pre-class videos over attending live lectures.	473	3.64
The flipped classroom helps me to apply knowledge in a more practical manner.	473	3.84
The flipped classroom structure improves my overall learning experience.	473	3.79
Flipped classroom helps to develop critical thinking.	473	3.87
The use of pre-class materials (videos, readings) is Beneficial to my learning.	473	3.86
The flipped classroom improved my academic Performance.	473	3.85
	473	3.82

Table 4.1 highlights students' perceptions of the flipped classroom method, showing a strong tendency towards its effectiveness. The overall mean score of 3.82 suggests that students find this learning approach highly beneficial and effective in enhancing their learning experience. The highest mean score, 3.93, reflects that students perceive the flipped classroom as engaging, making learning more interactive than

traditional methods. This suggests that students actively participate and show enthusiasm towards this approach. Additionally, students believe that the flipped classroom enhances critical thinking skills (3.87) and helps in applying knowledge practically (3.84), reinforcing its effectiveness in developing higher-order thinking skills. This approach is also perceived as improving overall academic performance (mean = 3.85) and offering a better understanding of the course material (mean = 3.77). However, a relatively lower score (3.64) indicates that not all students prefer watching pre-class videos over live lectures. This suggests that while many students appreciate the benefits of pre-class materials, some still favor traditional instructional methods.

Table 4.2

Engagement and Participation

Statements	N	Mean
I actively participate in class discussions.	473	3.93
The flipped classroom structure motivates me to prepare for class.	473	3.98
The flipped classroom increases my interest in the subject matter.	473	3.94
In-class activities help clarify concepts, I learned from the pre-class materials.	473	3.90
The flipped classroom model reduces my anxiety about preparing for in-class activities.	473	3.82
	473	3.91

Table 4.2 presents data on student engagement and participation in the flipped classroom. The overall mean score of 3.91 signifies that students actively participate in class discussions and engage with pre-class materials, indicating a positive learning experience. The highest mean score (3.98) reflects that students are highly motivated to prepare for class, suggesting that the flipped classroom approach fosters independent learning habits. Engagement in class discussions (3.93) and interest in the subject matter (3.94) also scored high, showing that students appreciate the interactive and collaborative aspects of this learning model. Additionally, in-class activities are highly effective in clarifying concepts (mean = 3.90). However, a slightly lower score (3.82) indicates that while the flipped classroom reduces anxiety, some students may still require additional support to adapt to its structure and expectations.

Table 4.3

Use of Technology

Statements	N	Mean
The videos and digital materials are easy to access.	473	3.97
Technology used in flipped classrooms (videos, online discussions) is user-friendly	473	4.01
The online materials help me to understand difficult concepts.	473	3.93
I prefer learning through online videos rather than reading textbooks.	473	3.64
Technological issues are barriers for me.	473	3.61
The use of digital tools helps me to become independent in my studies.	473	4.01
I believe that using technology enhances collaboration with peers for learning.	473	3.91
I feel confident using online platforms for flipped classroom activities.	473	3.94
The flipped classroom makes effective use of technology to improve learning.	473	4.01
	473	3.89

Table 4.3 demonstrates students' perceptions of the role of technology in the flipped classroom. The overall mean score of 3.89 suggests a positive response, indicating that students generally find technology beneficial in their learning. The highest mean score (4.01) suggests that digital tools foster independent learning,

helping students take control of their own academic progress. Additionally, students find technology user-friendly (4.01) and effective for understanding complex concepts (3.93), showing that technological integration plays a significant role in supporting comprehension. Additionally, students express confidence in using online platforms for flipped classroom activities (mean = 3.94), and they perceive that technology is effectively integrated to improve their overall learning experience (mean = 4.01). However, technological issues pose a challenge, as indicated by the lowest mean score (3.61), emphasizing the need for reliable technical support and accessibility improvements.

Table 4.4

Students' Responsibility

Statements	N	Mean
Flipped Classroom encourages me to take responsibility for my own learning.	473	4.11
I feel more accountable for my learning in the flipped classroom as compared to traditional settings.	473	4.02
I can manage my time effectively	473	3.75
I feel more confident in my ability to learn independently	473	4.08
I appreciate the flexibility of accessing pre-class materials (videos, readings) at any time.	473	3.84
The flipped classroom structure helps me to develop better study habits.	473	3.80
	473	3.93

Table 4.4 highlights the role of the flipped classroom in promoting student responsibility. The overall mean score of 3.93 indicates that students feel accountable for their learning, showing a high level of self-regulation in their academic activities. The highest mean score (4.11) suggests that students feel encouraged to take charge of their learning, while confidence in independent learning (4.08) and accountability (4.02) also received high ratings, reinforcing the effectiveness of the flipped model in fostering self-discipline. The flexibility of accessing pre-class materials, such as videos and readings, at any time is another highly valued feature, as reflected in a mean score of 3.8436. Additionally, the flipped classroom helps students develop better study habits (mean = 3.80). However, a lower score (3.75) on time management suggests that some students may require additional guidance in effectively managing their workload.

Table 4.5

Teacher support

Statements	N	Mean
The teacher is supportive and considerate towards me.	473	4.02
My teacher provides clear instructions for how to access and use pre-class materials (videos/readings).	473	3.89
My teacher provides useful feedback during in-class activities.	473	4
The teacher encourages participation and engagement during activities.	473	4.07
My teacher offers additional resources or help for students who struggle with the pre-class materials.	473	3.96
	473	4.0001

Table 4.5 presents data on the role of teacher support in the flipped classroom. The overall mean score of 4.0001 highlights strong teacher involvement in facilitating student learning. The highest mean (4.07) reflects that teachers effectively encourage student participation, promoting an interactive and engaging learning environment. Clear instructions (3.89) and additional resources for struggling students (3.96) are also well-rated, reinforcing the importance of teacher guidance.

Table 4.6

Collaboration

Statements	N	Mean
I often collaborate with my classmates during in-class activities.	473	3.98
It encourages more group work compared to traditional teaching methods.	473	4
Group activities help me to apply theoretical concepts in real-world problems.	473	4.01
It enhances my ability to work in teams.	473	4.05
Collaboration with classmates during class time improves my engagement with the course material.	473	4.05
The collaborative environment in the flipped classroom enhances my problem-solving skills.	473	3.85
Collaborating with peers outside the class enhances my understanding of course material.	473	3.89
	473	3.98

Table 4.6 examines students' perceptions of collaboration in the flipped classroom. The overall mean score of 3.98 demonstrates a strong preference for collaborative learning, suggesting that students appreciate working together on academic tasks. The highest mean score (4.05) indicates that in-class collaboration enhances engagement, while teamwork (4.05) and group activities (4.01) are also valued. Additionally, the collaborative environment supports problem-solving skills (mean = 3.85) and fosters peer collaboration outside the classroom to enhance understanding (mean = 3.89).

4.2 Section II- Inferential Statistics

Objective 2: To compare the perception of BS and MS students regarding the use of flipped classroom.

H_{01}: There is no significant difference of Flipped Classroom between BS and MS students

Table 4.7

Comparison of BS and MS student's perception

Flipped Classroom	Mean	Standard Deviation	t-test	P	Cohens'd
BS	3.9128	0.40	.725	0.032	0.13
MS	3.8772	0.28			

Table 4.7 indicates that an independent samples t-test was conducted to compare the perceptions of BS and MS students regarding the flipped classroom approach. The results showed a small difference in mean scores, with BS students (M = 3.91, SD = 0.40) reporting slightly higher perceptions than MS students (M = 3.88, SD = 0.22). Although the difference was statistically significant (as reported earlier), the calculated effect size (Cohen's *d* = 0.13) indicates a very small practical difference between the two groups. According to Cohen's (1988) guidelines, an effect size below 0.20 is considered small and may not have meaningful educational impact. Hence the comparison between BS and MS regarding flipped classroom revealed a significant difference.

4.3 Section III- Thematic Analysis

Objective 3: To identify teachers' perceptions regarding effectiveness of the flipped classroom in higher education institutions

This section includes analysis and interpretation of data collected through semi structured interviews conducted with the teachers. The semi-structured interviews encapsulated diverse views of teachers regarding Flipped Classroom at higher education institutions. The researcher personally visited prospective teachers and conducted interviews. The interview contained 12 questions.

The researcher used a thematic approach to analyze the data, focusing on identifying key themes and patterns that aligned with the study's goals and questions. First, they became familiar with the data by listening to audio recordings and reading the transcribed interviews several times. Then, they started the process of coding by pinpointing important ideas within the data and assigning labels, or codes, to these ideas. These codes served as the foundation for the analysis. Next, the researcher reviewed the coded data multiple times to refine the codes and find similarities between them. Finally, similar codes were grouped together to form broader themes, which provided meaningful insights into the study's objectives and helped summarize the responses effectively. (Akram et al., 2021).

we did not use any software for that, "I began the coding process by carefully reading through the raw data collected from interviews multiple times to familiarize myself with the content. I used open coding to break the data into smaller, meaningful segments, assigning initial codes to key phrases, patterns, or recurring ideas that emerged naturally from participants' responses. These codes were kept close to the original language used by participants to preserve meaning. As I progressed, I compared and refined these codes, grouping similar ones together and identifying patterns across the data. Eventually, these refined codes were categorized under broader themes that reflected the key aspects of participants' experiences and perspectives." The word most was used when more than 50% of participants agreed to the statement or answered in a similar manner whereas the word few was used for less than 50%.

"To enhance the credibility of the qualitative findings, member checking was conducted after the initial thematic analysis. Selected were approached and presented with a summary of the emerging themes and interpretations drawn from their responses. They were asked to review the accuracy and relevance of the interpretations to ensure that their perspectives were represented faithfully. Feedback received from participants

was used to make minor adjustments in theme labeling and interpretation, which strengthened the trustworthiness of the data." Ethical guidelines were strictly followed to maintain confidentiality and integrity in reporting.

4.3.1 Themes

I. Redefinition of Teaching Roles
- Facilitator role
- Mentoring
- Individualized support
- Critical thinking focus.

II. Autonomy in Learning
- Pre-class preparation
- Self-paced learning
- Student accountability
- Adaptation challenges.

III. Enhanced Classroom Engagement
- Collaborative problem-solving
- Interactive activities
- Hands-on sessions
- Active participation.
- Personalized feedback
- Diverse methods
- Creative demonstration.

IV. Technological Challenges
- Accessibility issues
- Technical reliability, student proficiency, troubleshooting.

V. Development of Critical Thinking and Problem-Solving Skills
- Application-focused tasks
- Real-world problem-solving
- Guided exploration
- Analytical skills.

VI. Diverse Student Response

4.3.2 Interpretation

4.3.2.1 Redefinition of Teaching Roles

Most teachers described a shift from being traditional knowledge transmitters to facilitators and mentors. This change allows them to guide students during in-class activities, provide individualized support, and encourage critical thinking. Few teachers highlighted that this shift required them to develop new strategies to adapt to this role effectively.

Most teachers emphasized their role as facilitators, with one noting, "My role shifts from being a knowledge transmitter to a facilitator and mentor."

Mentoring students was another significant aspect, as highlighted by a teacher who said, "I act as a catalyst for learning, empowering students to think critically and independently."

Few teachers mentioned challenges in providing individualized support due to varying student needs, but they recognized its importance in fostering engagement.

One of the teachers also said that “My role transitions from lecturer to facilitator. Instead of delivering content, I guide, mentor, and provide personalized support during class, ensuring every student can apply their pre-class learning effectively”. Another respondent said that “My role is more hands-on, and student focused. I address challenges as they arise during class activities”.

Another respondent said that “My role has evolved. I'm no longer the sole source of information. Instead, I act as a facilitator, guiding students through the learning process. I help them clarify concepts, address misconceptions, and provide feedback on their work. I also create a supportive learning environment where students feel comfortable asking questions and collaborating with their peers.

Another unique response was “"I perceive my role in the flipped classroom as more collaborative. Instead of leading discussions myself, I facilitate conversations among students. They engage with the material at home, so class time becomes valuable for clarifying their understanding and working together on projects or challenging concepts”.

4.3.2.2 Autonomy in Learning

Participants described autonomy through experiences such as setting their own pace during online modules, choosing which resources to engage with, and feeling a sense of control over their academic outcomes. The flipped classroom model promotes autonomy by encouraging students to take responsibility for their learning. Most

teachers appreciated the flexibility it provides, but few noted that some students struggled with increased accountability.

Most teachers observed that students enjoyed pre-class preparation, stating, "Students enjoy the flexibility of learning at their own pace before class."

Accountability was emphasized, with one teacher sharing, "The model empowers students to take ownership of their learning."

One of the teachers said that “if we talk about starting semesters of bachelor's I’ve been disappointed in students’ responses to their increased responsibility. Many seem to feel they can ‘wing it’ during class, which leaves them unprepared for the level of engagement expected. As a result, class discussions often fall flat, and I feel like I’m not achieving the learning objectives I set out to fulfill”.

Few teachers noted adaptation challenges, such as difficulty in managing time or understanding the material independently, which affected some students' performance.

One of teacher has a unique response “Students’ responses are quite varied. Many appreciate the autonomy involved in preparing for class, as it allows them to engage with the material more deeply at their own pace. However, I’ve also encountered students who struggle with motivation and tend to procrastinate. For these students, it’s important to cultivate a structured approach to ensure they don’t fall behind.

4.3.2.3 Enhanced Classroom Engagement

The flipped classroom creates a dynamic learning environment where active participation and collaboration are central. Most teachers reported positive outcomes from interactive activities and hands-on sessions, while few highlighted the need for consistent participation from all students.

Most teachers emphasized collaborative problem-solving, with one stating, "Collaborative problem-solving during class is the most effective."

Interactive activities were a key focus, as another teacher noted, “Hands-on lab sessions are key, where students use pre-class content as a basis for experiments”. Hands-on sessions have become a cornerstone of my flipped classroom. After students review content at home, we dedicate class time to applying that knowledge through experiments or group projects. For example, during a science unit, we conduct experiments where students can test the principles, they learned online. This active application of knowledge not only solidifies their understanding but also promotes

teamwork and critical thinking skills. I've noticed that students are much more invested in their learning when they can see real-world applications.

Teachers employ diverse strategies to maintain student engagement. Most teachers highlighted the effectiveness of gamification and personalized feedback, while few pointed out the need to adapt strategies to suit individual preferences.

One of the teachers shared, "Gamified elements, such as leaderboards and achievement badges, create a sense of excitement." I've found gamification to be an incredibly effective tool for maintaining student engagement. By incorporating game design elements into my lessons—like points, levels, and rewards—I create a more dynamic and interactive learning environment. For instance, I use quizzes in the form of games where students can earn points for correct answers. Not only does this make learning fun, but it also fosters a sense of friendly competition which motivates students to participate actively and review their material more thoroughly.

Personalized feedback was valued, with one teacher mentioning, "Celebrating small wins and achievements fosters a positive learning environment." "Personalized feedback is essential for keeping students engaged with their learning. I make it a point to provide specific, constructive feedback on assignments and projects, rather than generic comments. I often include voice or video feedback so students can hear my tone and passion for the subject, which adds a personal touch. When students feel that their individual efforts are recognized and valued, they are more motivated to invest in their work. I also encourage them to ask questions based on my feedback, creating a dialogue that deepens their understanding."

Many teachers emphasized the importance of continuously updating methods to align with students' evolving needs. I.e. Understanding that each student has unique preferences and learning styles is crucial for engagement. I regularly survey my students to learn about their interests and preferred methods of learning. For instance, some students thrive on visual aids, while others prefer hands-on activities or group discussions. By mixing my teaching strategies such as integrating videos, interactive simulations, or collaborative projects, I can cater to diverse preferences and keep students actively involved. Adapting my methods has visibly increased participation rates and student satisfaction in class.

Few teachers pointed out that while many students thrive in the flipped classroom, a few remain passive during discussions. These students often seem hesitant to speak up, perhaps due to a lack of confidence or fear of making mistakes. It's not

uncommon for quieter students to rely on their peers to carry the conversation, which can inhibit their learning. To address this, I make it a point to encourage participation through structured activities, such as small group discussions or 'fishbowl' techniques, where they can share thoughts in a less intimidating environment.

One of the teachers said that "An effective tactic I've adopted is to utilize follow-up questions during discussions. When I notice a student is especially quiet, I address them by name and ask open-ended questions related to their thoughts or previous contributions. This approach not only provides them with an opportunity to weigh in but also signals that their insights matter. I've found that even small nudges in this direction can make a significant difference in their willingness to share."

4.3.2.4 Technological Challenges

Technology plays a critical role in the flipped classroom model, but it also presents challenges. Most teachers mentioned issues such as accessibility and technical reliability, while few highlighted difficulties in supporting students with limited digital proficiency.

Most teacher mentioned "One of the significant challenges we've encountered is accessibility. Not all students have reliable internet access or devices at home, which puts them at a disadvantage when it comes to engaging in pre-class materials. I've seen instances where students can't complete their readings or watch instructional videos because they lack technology at home. To address this, I've started offering alternative resources, like printable materials or designated times for students to use school facilities. Additionally, I work to ensure that any online materials are accessible on various devices, including smartphones and tablets, to accommodate different situations".

Technical reliability was a concern for many, with one teacher describing "Compatibility issues between different tools and platforms. On several occasions, we've faced outages or glitches with the platforms we use, which can disrupt the flow of a lesson and leave students frustrated. For example, if a video hosting site goes down just before class, students come in unprepared. To mitigate this, I encourage students to download materials whenever possible and keep backups of all crucial documents and video links. I also stay in close contact with our IT department to ensure that technical problems are resolved quickly. Overall, building a level of flexibility into our lesson plans helps when technology doesn't cooperate".

One of the teacher responses was “Ensuring equal access to technology in a flipped classroom is paramount. I assign homework that requires students to watch videos and participate in online discussions. However, I’ve noticed that some students miss out due to varying levels of access to devices or reliable Wi-Fi. It’s essential to have a comprehensive plan that addresses these disparities. For instance, allowing students to download materials when available and providing on-campus resources can help alleviate some of these barriers. Moreover, I often check in with students individually to identify who may need additional support with accessing technology”.

4.3.2.5 Development of Critical Thinking and Problem-Solving Skills

- Application-focused tasks
- Real-world problem-solving
- Guided exploration Analytical skills

The flipped classroom enhances students' critical thinking through application focused tasks. Most teachers observed significant improvements in analytical skills, while few emphasized the need for additional resources to further develop these competencies.

Most teachers stated, "The emphasis on application during class boosts both critical thinking and creativity in problem-solving." In my flipped classroom, application-focused tasks have transformed how students engage with the material. Instead of just absorbing information during lectures, they come to class ready to apply their knowledge through real-world scenarios. For instance, in my biology class, after reviewing concepts about ecosystems at home, students participate in project-based learning where they design their own ecosystem models. This hands-on approach fosters critical thinking, as they must analyze how different variables interact and what impact their choices may have on the system. The shift from passive learning to active problem-solving has led to noticeable improvements in their analytical abilities.

Real-world problem-solving was highlighted as a strength, with one teacher saying, "One of the most rewarding aspects of the flipped classroom has been implementing group problem-solving activities. After students have covered the content at home, I present them with complex, open-ended problems in class that require teamwork to solve. For example, in my physics class, students might tackle a real-world problem related to energy consumption. By brainstorming solutions and debating their merits, they develop critical thinking and collaboration skills. This not

only enhances their analytical abilities but also prepares them for real-life scenarios where teamwork is essential."

Few teachers noted the need for structured tasks to support students struggling with analytical thinking. In my experience, I've seen that some students struggle with analytical thinking because they often feel overwhelmed by open-ended questions or complex tasks. They might not know where to start or how to break down the problem effectively.

4.3.2.6 Diverse Student Response

Teachers reported varied levels of engagement and adaptation between different groups of students. Most teachers observed that MS students showed greater self-motivation and analytical engagement, while few noted that BS students benefited more from structured guidance.

- Most teachers noted, "MS students are generally more self-motivated and engage deeply, while BS students need more structure and encouragement."
- Few teachers observed, "BS students often rely on guided activities, requiring additional scaffolding to thrive in the flipped classroom environment."
- Teachers emphasized the importance of tailoring approaches to meet the differing needs of both groups. Teachers employ diverse strategies to maintain student engagement. Most teachers highlighted the effectiveness of gamification and personalized feedback, while few pointed out the need to adapt strategies to suit individual preferences.
- Personalized feedback was valued, with one teacher mentioning, "Celebrating small wins and achievements fosters a positive learning environment."
- Few teachers emphasized the importance of continuously updating methods to align with students' evolving needs.

CHAPTER 5

SUMMARY, FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Flipped Classroom, a modern teaching method designed to make learning more engaging and effective for students in higher education. In this approach, lectures are done outside the classroom, often through videos or readings, so class time can focus on discussions, teamwork, and problem-solving. It is based on the idea that students learn better when they prepare on their own before class and then work actively with others during class. The objectives of study were to find out student's perceptions regarding the effectiveness of the flipped classroom in higher education institutions, to compare the perception of BS and MS students regarding the use of flipped classroom and to identify teachers' perceptions regarding effectiveness of the flipped classroom in higher education institutions.

The research used questionnaire and interviews with students and teachers from the Department of Educational Leadership and Management at International Islamic University Islamabad. In questionnaire there were 40 statements based on six indicators of flipped classroom i.e. perception, engagement and participation, use of technology, student's responsibility, teacher support and collaboration. Twelve questions were included for semi-structured interviews.

The results showed that most students found the flipped classroom helpful. They said it improved their academic performance, critical thinking, and class participation. However, some students faced challenges, such as difficulties with technology or adjusting to active learning. Teachers appreciated that the flipped classroom encourages collaboration and deeper understanding of the subject. However, they also noted that it requires a lot of preparation, and teaching methods need to be flexible to suit different learning styles. In summary, the study found that the flipped classroom has great potential to improve learning, but it also comes with challenges that need careful planning and support to overcome.

5.2 Findings

The following findings were drawn from the collected and analyzed data of study.

1. It is found that students perceived the flipped classroom method as highly effective, with an overall mean score of 3.8240. The findings indicate that students perceive the flipped classroom as engaging (3.9345). Additionally, students believe that the flipped classroom enhances critical thinking skills (3.8795) and also perceived as improving overall academic performance (3.8520) and offering a better understanding of the course material mean 3.7780 (Table 4.1).
2. The findings indicated that students reported high levels of engagement and participation in flipped classroom activities with mean score of 3.9171. The mean score (3.9852) reflects that students are highly motivated to prepare for class, engaged in class discussions (3.9366) and interest in the subject matter (3.9408) also scored high. Additionally, in-class activities are highly effective in clarifying concepts (mean 3.9006) (Table 4.2).
3. The findings indicated that students generally perceived the use of technology in flipped classrooms as highly beneficial with mean score of 3.897. Findings highlight that digital tools foster independent learning (4.0190), students find technology user-friendly (4.0169) and effective for understanding complex concepts (3.9387). Additionally, students express confidence in using online platforms for flipped classroom activities (mean 3.9450), and they perceive that technology is effectively integrated to improve their overall learning experience (4.0127) (Table 4.3).
4. The findings showed that students believed the flipped classroom approach significantly enhanced their sense of responsibility for learning with mean score of 3.9300. The result showed that students feel encouraged to take charge of their learning (4.1184), while confidence in independent learning (4.0825) and accountability (4.0254) also received high ratings. The flexibility of accessing pre-class materials at any time is another highly valued feature, as reflected in a mean score of 3.8436. Additionally, the flipped classroom helps students develop better study habits with mean of 3.8076 (Table 4.4).
5. The findings indicated that teacher support in the flipped classroom was highly valued by students with mean scores of 4.0001. The mean (4.0761) reflects that teachers effectively encourage student participation, Clear instructions (3.8901) and additional resources for struggling students (3.9662) are also well-rated,

reinforcing the importance of teacher guidance in supporting students' understanding and academic success (Table 4.5).

6. The findings revealed that students considered collaboration in flipped classrooms to be highly beneficial with mean score of 3.9803. The mean score (4.0529) indicates that in-class collaboration enhances engagement, while teamwork (4.0507) and group activities (4.0190) are also valued. Additionally, the collaborative environment supports problem-solving skills (mean 3.8520) and fosters peer collaboration outside the classroom to enhance understanding with mean of 3.8983 (Table 4.6).
7. The findings indicate that P value 0.5 was more than the level of significance 0.05 which mean that there is a significant difference between perception of BS and MS students regarding Flipped Classroom. Therefore, the null hypothesis was rejected (Table 4.7).
8. Study revealed that the flipped classroom approach changes the teacher's role. Instead of just giving lectures and sharing knowledge, teachers focus on helping students during class activities, offering one-on-one support, and encouraging them to think more deeply. Many teachers like this new role because it lets them guide students more personally and helps them engage better with the subject.
9. This study emphasizes that the flipped classroom fosters student autonomy by encouraging students to take responsibility for their own learning. Teachers found that the majority of students valued the flexibility of pre-class preparation, which allowed them to learn at their own pace. According to one teacher, "Students enjoy the flexibility of learning at their own pace before class." However, several pupils struggled with the additional accountability and self-discipline demanded by this methodology.
10. The study also indicated that the flipped classroom creates a dynamic and interactive learning environment that emphasizes active participation and collaboration. Teachers noted that collaborative problem-solving and hands-on activities were very helpful at engaging students and reinforcing their knowledge of pre-class information.
11. The flipped classroom concept relies heavily on technology, but it also has several drawbacks. Teachers identified accessibility, technological reliability, and different degrees of student digital skill as significant hurdles. Many

teachers reported that not all students had reliable access to the internet or devices at home, limiting their capacity to participate with pre-class content.

12. Research and evidence state that the flipped classroom helps students think critically and solve problems by focusing on practical activities and assignments. Teachers noticed that students became better at analyzing and applying what they learned. One teacher said, "Doing activities in class improves both creative thinking and problem-solving." Exercises like solving real-world problems, open-ended tasks, and group projects were especially good at building these skills.
13. Teachers noticed that different groups of students responded to the flipped classroom in different ways. MS (Master's) students, who are usually more motivated and good at analyzing, adapted easily to this approach. BS (Bachelor's) students, however, needed more clear instructions and support to succeed. One teacher said, "MS students are more self-driven, while BS students need more structured help." This shows that teachers need to use different strategies to meet the unique needs and learning styles of graduate and undergraduate students.

Triangulation

Overall, this study shows a well-rounded view of the flipped classroom model in higher education, focusing on its benefits and challenges. Like making students more engaged, improving their academic performance, and helping them take more responsibility for their own learning. Students and teachers both showed positive reactions, with students liking the new way of learning and teachers praising its ability to boost critical thinking, teamwork, and practical skills. However, some students who are used to traditional learning methods and some technical problems made the transition harder at times. Despite these challenges, the overall feedback shows that the flipped classroom can be a powerful teaching tool. As long as teachers get the right support, technology works well, and teaching methods are adjusted to handle resistance and improve experience.

5.3 Discussion

This study was designed to find out about student’s perceptions and to identify teachers' perceptions regarding the effectiveness of the flipped classroom in higher education institutions. The results of this study needed to be discussed and compared with the findings of other studies of this type.

The first key finding of the study highlights that student appreciated the flexibility of accessing pre-class materials, such as videos and readings, which allowed them to learn at their own pace and come to class better prepared. This aligns with Novick's (2014) findings, which emphasized the flipped classroom's ability to provide students with the opportunity to revisit materials as needed, enhancing their understanding of challenging concepts.

Similarly, Enfield (2013) found that flipped learning boosts students' confidence and enables them to take greater control of their learning process. The flexibility of the flipped classroom model supports diverse learning styles, as students can engage with the content in a way that suits their individual needs. This study further revealed that students valued the ability to prepare before class, which not only improved their understanding but also made them feel more confident during in-class activities. However, some students struggled with the responsibility of pre-class preparation, indicating the need for structured support to ensure consistent engagement. This finding underscores the importance of balancing flexibility with accountability to maximize the benefits of the flipped classroom.

Another significant finding of the study is the effectiveness of collaborative activities and group work during class time in helping students apply theoretical concepts to real-world problems. This finding is consistent with Herreid and Schiller's (2013) research, which noted that flipped classrooms create more opportunities for hands-on, interactive learning, allowing students to better understand and apply course material.

Similarly, Strayer (2012) observed that students in flipped classrooms enjoy the collaborative environment and find it more engaging than traditional lecture-based methods. In this study, teachers reported that group activities, such as problem-solving tasks and discussions, fostered teamwork and critical thinking among students. For example, students were able to use pre-class materials as a foundation for in-class experiments or debates, which deepened their understanding of the subject matter. This finding highlights the flipped classroom's potential to enhance social and cognitive skills, making learning more interactive and meaningful. However, some students remained passive during group discussions, indicating the need for strategies to encourage equal participation and ensure that all students benefit from collaborative learning.

The study also identified challenges related to technological barriers, such as limited access to devices and unreliable internet, which hindered some students' ability to engage with pre-class materials. This finding aligns with Yelland's (2001) observation that limited access to technology can prevent the effective implementation of technology-driven teaching models like the flipped classroom.

Similarly, Vitriani (2023) noted that students often face difficulties adjusting to the independent learning style required by the flipped classroom, particularly when technological resources are inadequate. Teachers in this study reported that some students struggled to complete pre-class tasks due to a lack of reliable internet or devices, which created disparities in learning opportunities. To address these challenges, teachers suggested providing alternative resources, such as printed materials or access to on-campus facilities, to ensure inclusivity. This finding underscores the importance of addressing technological barriers to create an equitable learning environment where all students can fully participate in the flipped classroom model.

Another important finding of the study is the difference in how BS and MS students responded to the flipped classroom model. MS students demonstrated higher levels of self-motivation, analytical engagement, and independent learning, which allowed them to adapt more effectively to the flipped classroom. In contrast, BS students often required more structured guidance and teacher support to succeed. This finding is consistent with research conducted by Galway (2014), which emphasized the importance of tailoring teaching strategies to meet the needs of different student groups.

Singh (2020) highlighted the role of constructivist learning theories in addressing individual learning needs, suggesting that differentiated approaches are necessary for effective teaching. In this study, teachers observed that MS students were better equipped to take responsibility for their learning, while BS students benefited from additional scaffolding and structured activities. This finding highlights the need for educators to adapt their teaching strategies to accommodate the varying needs and learning styles of undergraduate and graduate students, ensuring that both groups can thrive in the flipped classroom environment.

Lastly, the study revealed that the flipped classroom model significantly enhanced critical thinking and problem-solving skills through application-focused tasks and real-world problem-solving activities. Teachers reported that the emphasis on applying knowledge during class improved students' analytical abilities and creativity.

This finding aligns with the research of Hava (2021), who found that flipped learning increased participation and improved learning outcomes among university students.

Herreid and Schiller (2013) noted that flipped classrooms encourage students to engage in higher-order thinking by solving complex, open-ended problems. In this study, teachers observed that students were able to analyze and evaluate concepts more effectively when they were given opportunities to apply their knowledge in practical scenarios. For example, group projects and case studies allowed students to collaborate and develop solutions to real-world challenges, fostering critical thinking and teamwork. However, some students struggled with analytical tasks, indicating the need for additional guidance and structured support to help them develop these skills. This finding underscores the flipped classroom's potential to prepare students for real-life challenges by promoting active learning and critical thinking.

5.4 Conclusions

On the basis of findings, the following conclusions were drawn

1. The flipped classroom model significantly increases student engagement and participation. Both quantitative and qualitative data show that students are more motivated and engaged in their learning process, with structured in-class activities increasing engagement and comprehension.
2. When comparing undergraduate (BS) and graduate (MS) students, the study revealed differences in their experiences with the flipped classroom. MS students, who exhibited higher levels of self-motivation, analytical thinking, and independent learning, adapted more effectively to the model. In contrast, BS students often struggled with time management and required more structured guidance and teacher support to succeed. These differences suggest that the flipped classroom model should be tailored to accommodate the distinct needs and learning styles of undergraduate and graduate students to ensure its effectiveness for both groups.
3. Students believe the flipped classroom format is useful for increasing academic performance and developing critical thinking skills. The use of pre-class materials such as films and reading allow students to prepare ahead of time, resulting in deeper learning during in-class activities.
4. The flipped classroom model encourages students to take more responsibility for their learning. Students reported increased time management, autonomous

learning skills, and the formation of better study habits as a result of the model's flexibility.

5. Teacher guidance and support play a critical role in the success of the flipped classroom. Effective teacher facilitation during class time enhances collaboration, problem-solving, and engagement among students, creating a supportive learning environment.

5.5 Study Limitation

While this study provides valuable insights into the perceptions of students and teachers regarding the flipped classroom model in a higher education setting, several limitations must be acknowledged:

1. The study was limited to female students and teachers from the Department of Educational Leadership and Management at the International Islamic University Islamabad. This restricts the generalizability of the findings across genders and institutions.
2. Data was collected from only one academic department. As teaching styles, course content, and digital exposure vary across faculties, the findings may not represent perceptions in other departments or disciplines.
3. The research was conducted within a single university located in an urban setting. Students from rural or less digitally-equipped institutions may experience the flipped classroom differently due to access barriers.
4. Both quantitative and qualitative data relied on participants' self-reported perceptions, which may be influenced by social desirability or recall bias.

5.6 Recommendations

According to the findings and conclusions the following recommendations were formulated:

1. The use of digital tools and online materials in the flipped classroom is valued for its accessibility and usability. However, some students found barrier in technological aspect. So, it is recommended that institutions and governments may prioritize technical infrastructure improvements to guarantee students and teachers have access to gadgets and the internet. This can be managed by modernizing IT systems, providing affordable or free digital tools, and maintaining centralized platforms for spreading pre-class materials and technical assistance.

2. Teachers require comprehensive training to become acquainted with flipped classroom approaches and the usage of technology resources. So, it is recommended that institutions can conduct professional development programs to train educators in digital pedagogy, interactive learning techniques, and student engagement strategies. This can be done by organizing workshops and professional development programs to help educators create interesting digital content, facilitate interactive in-class activities, and overcome student opposition.
3. When comparing undergraduate (BS) and graduate (MS) students, BS students often struggled with time management and required more guidance to succeed. It is recommended that teachers may employ clear directions, planned lessons, and engaging activities to keep students involved. Instead of assigning open-ended work, teachers might use guided activities, checklists, and mini quizzes to assist students gradually gain knowledge. Encouraging pupils to ask questions and providing regular feedback will help them gain confidence in their studies.

5.7 Recommendation for Future Researchers

Future recommendations were made to further explore the concept of educational practices and teacher leadership skills.

1. Research could focus on comparing the effectiveness of the flipped classroom model across various academic disciplines, such as humanities, sciences, and professional studies. This would help identify subject-specific advantages and challenges associated with the model.
2. Research could delve deeper into strategies for improving student motivation and accountability in the flipped classroom model. This could include examining the effectiveness of gamification, peer mentoring, and other engagement techniques.
3. Further qualitative studies could focus on understanding the nuanced perspectives of both students and teachers regarding the flipped classroom model. This would provide deeper insights into their experiences, challenges, and suggestions for improvement.
4. This research was delimited to the female teachers of ELM in International Islamic University Islamabad. In future, research may be conducted on male and female students and teachers of public and private universities of Islamabad.

REFRENCES

Ahmad, S. Z. (2016). The flipped classroom model to develop Egyptian EFL students' listening comprehension. *English Language Teaching, 9*(9), 166–178. https://doi.org/10.5539/elt.v9n9p166

Ahmad, S. Z. (2016). The flipped classroom model to develop Egyptian EFL students' listening comprehension. *English Language Teaching, 9*(9), 166–178. https://doi.org/10.5539/elt.v9n9p166

Alharbi, A. H. (2015). A flipped learning approach using social media in health informatics education. *Creative Education, 6*(13). https://www.scirp.org/reference/referencespapers?referenceid=1536743

Aljaraideh, Y. (2019). Students' perception of flipped classroom: A case study for private universities in Jordan. *Journal of Technology and Science Education, 9*(3), 370. https://doi.org/10.3926/jotse.648

Anem, S. A., & Fatima, S. S. (2017). Flipped classroom instructional approach in undergraduate medical education. *Pakistan Journal of Medical Sciences, 33*(6), 1424–1428. https://doi.org/10.12669/pjms

Bens, I. (2017). *Facilitating with ease! Core skills for facilitators, team leaders and members, managers, consultants, and trainers* (4th ed.). Canada: John Wiley & Sons. https://books.google.com.pk/books?id=qm43DwAAQBAJ

Birenbaum, M. (2003). New insights into learning and teaching and their implications for assessment. In *Optimising New Modes of Assessment: In Search of Qualities and Standards* (pp. 13–36). https://doi.org/10.1007/0-306-48125-1_2

Butt, A. (2014). Student views on the use of a flipped classroom approach: Evidence from Australia. *Business Education and Accreditation, 6*(1), 33–43. https://ideas.repec.org/a/ibf/beaccr/v6y2014i1p33-43.html

Caruso, H. (2008). Harnessing the power of emergent interdependence to promote diverse team collaboration. *Diversity and Groups (Research on Managing Groups and Teams, 11*, 245–266). https://doi.org/10.1016/S1534-0856(08)11011-8

Creswell, J. W. (2012). *Research design: Qualitative, quantitative, and mixed methods approach*. Thousand Oaks, CA: Sage Publications. Retrieved from https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf

Divjak, B. (2022). Flipped classrooms in higher education during the COVID-19 pandemic: Findings and future research recommendations. *International Journal of Educational Technology in Higher Education, 19*(9), 2–3. https://doi.org/10.1186/s41239-021-003164

Elazab, S. M. (2015). The effectiveness of the flipped classroom in higher education. *2015 Fifth International Conference on e-Learning (econf)* (pp. 1–5). Cairo. https://doi.org/10.1109/ECONF.2015.34

Eunjeong, P. (2022). Korean pre-service teachers' perspectives on flipped learning in the EFL context. *Language Teaching Research Quarterly, 28,* 74–86. https://doi.org/10.32038/ltrq.2022.28.04

Gijbels, D. (2010). Understanding the effects of constructivist learning environments: Introducing a multi-directional approach. *Instructional Science, 36*, 351–357. https://doi.org/10.1007/s11251-008-9059-4

Hung, H.-T. (2015). Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning, 28*(1), 81–96. https://doi.org/10.1080/09588221.2014.967701

Hadiyanto. (2023). Teachers' perceptions regarding the flipped classroom method of using Google Classroom during the COVID-19 pandemic. *Journal of Language and Education, 1*(2), 2–3. https://doi.org/10.22437/langue.v

Khan, M. H. (2021). Flipped classroom: How higher education institutions (HEIs) of Bangladesh could move forward during the COVID-19 pandemic. *Social Sciences & Humanities Open, 4*(1), 3–4. https://doi.org/10.1016/j.ssaho.2021.100187

Khurshid, D. (2020). Students' and teachers' perception about the flipped classroom instructional strategy in Pakistan. *International Journal of Management, 11*(8), 1908–1921. https://doi.org/10.34218/IJM.11.8.2020.169

Killon, R. (2007). *Effective teaching strategies*. Thomson Social Science Press. https://books.google.com.pk/books?id=Y535J63QV1kC

Li, Z., & Li, J. (2022). Using the flipped classroom to promote learner engagement for the sustainable development of language skills: A mixed-method study. *MDPI, 14*(10), 2–3. https://doi.org/10.3390/su14105983

Magaña, A. C. (2022). Analysis of prospective teachers' perceptions of the flipped classroom as a classroom methodology. *Societies, 12*(4), 1–14. https://doi.org/10.3390/soc12040098

Mangal, U. (2011). Essentials of educational technology. New Delhi, India: PHI Learning Pvt. Ltd. Retrieved from https://books.google.com.mt/books?id=Sc9upWs956cC

Macleod, S. (2025, March 17). *Operant conditioning: What it is, how it works, and examples*. Simply Psychology. https://www.simplypsychology.org/operant-conditioning.html

Minaz, M. (2018). Effect of flipped classroom strategy on the performance of prospective teachers of Khyber Pakhtunkhwa. *42.*

Ozdamli, F. (2016). Flipped classroom approach. *World Journal on Educational Technology, 8*(2). https://doi.org/10.309890120

Ozdamli, F., & Aşıksoy, G. (2016). Flipped classroom approach. *World Journal on Educational Technology: Current Issues, 8*(2), 102–103. https://doi.org/10.18844/wjet.v8i2.640

Petrina, S. (2007, January). Advanced teaching methods for the technology classroom. *International Journal of Technology and Design Education, 17,* 109–111. https://doi.org/10.1007/s10798-007-9026-4

Qaisar, S. (2019, June). The flipped classroom: A teaching model for teacher education. *Pakistan Social Sciences Review, 3*(1), 141–156.

Røkenes, F. M., & Han, H. (2023, May 1). Student teachers' perceptions of flipped classroom in EFL teacher education. *Education and Information Technologies, 29,* 1540. https://doi.org/10.1007/s10639-023-11839-w

Sadaqat, M., & Ghani, M. (n.d.). *Effect of PQ4R study strategy in scholastic achievement of secondary school students in Punjab* (p. 11). Retrieved from https://scispace.com/pdf/effect-of-pq4r-study-strategy-in-scholastic-achievement-of-52scixd68c.pdf

Sharom, K. (2021, February). A conceptual framework on technology integration in English writing flipped classroom. *IOP Conference Series: Materials Science and Engineering.* https://doi.org/10.1088/1757-899X/1051/1/012010

Singh, C. S. (2020, June 20). A review of research on the importance of higher-order thinking skills (HOTS) in teaching English language. *Journal of Critical Reviews, 7*(8), 740–747. https://doi.org/10.31838/jcr.07.08.161

Santrock, J. (2017). *Children* (14th ed.). Texas: McGraw Hill Education. https://www.mheducation.com/unitas/highered/samplechapters/9781260073935.pdf

Santrock, J. W. (2006). *Educational psychology* (6th ed.). McGraw-Hill.

Solomon, S. (2024, April 3). Cooperative learning: A complete guide for teachers. *Teacher Vision.* https://www.teachervision.com/professionaldevelopment/cooperative-learning

Sözen, E., & Güven, U. (2019, september 11). The Effect of Online Assessments on Students' Attitudes Towards Undergraduate-Level Geography Courses. *International Education Studies, 12*(10). doi: doi:10.5539/ies.v12n10p1

Strayer, J. (2007). The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flipped classroom that used an intelligent tutoring system. *Ohio LINK Electronic Theses and Dissertations Cente*r. https://etd.ohiolink.edu/aprod/etd/r/1501/10?clear=10&p10_accession_num=osu1189523914

Sytovich, M. (2019). Flipped classroom technology and its implementation at various levels of higher education. *Educational Sciences, 11*(3), 21–32. https://doi.org/10.14529/ped190302

Tufail, M. (2015). Effectiveness of flipped classroom instruction for nurturing prospective teachers' reflective thinking skills. *Educational Research Journal, 34–36.*

Vitriani. (2023, June). Teaching factory models using flipped classroom and knowledge management system-based in improving 21st-century competencies in vocational high schools. *Al-Ishlah: Journal Pendidikan, 15*(2), 1343–1357. https://doi.org/10.35445/alishlah.v15i2.3785

Westwood, P. (2008). *What teachers need to know about teaching methods.* Camberwell, Australia: ACER Press. https://channayousif.wordpress.com/wpcontent/uploads/2011/06/what-teachers-need-to-know-about-teachingmethods_0864319126.pdf

Xu, Z. (2009). Research and practice on new interactive teaching model based on constructivist learning theory. *IT in Medicine and Education, 2008 ITME 2008 IEEE International Symposium,* 182–188. https://doi.org/10.1109/ITME.2008.4743848

Zainuddin, Z. (2015). Exploring the potential of flipped classroom approach for higher education in Aceh. *Aceh Development International Conference,* 25–26.

https://www.academia.edu/36959355/Exploring_The_Potential_Of_Flipped_Classroom_Approach_For_Higher_Education_In_Aceh

Zeewaqar, M. (2024, September). Barriers to digital learning: Challenges in online education in Pakistan. *Research Gate.* https://doi.org/10.20944/preprints202409.1489.v1

APPENDICES

APPENDIX- I

Topic: Flipped Classroom at Higher Education Institutions: Analysis of Students and Teachers Perceptions

The flipped classroom (FC) is a teaching method where students learn the lesson material before class, usually by watching videos or completing readings, and then applying what they have learned during in-class activities

Objectives of the Study

i To find out student's perceptions regarding the effectiveness of the flipped classroom in higher education institutions

ii To compare the perception of BS and MS students regarding the use of flipped classroom

iii To identify teachers' perceptions regarding effectiveness of the flipped classroom method in higher education institutions

Questionnaires for Students

Dear students,

I am MS scholar from the department of Educational Leadership and Management, International Islamic University Islamabad. I am conducting research for my thesis on "Flipped Classroom at Higher Education Institutions: Analysis of Students and Teachers Perceptions". The purpose of this questionnaire is to gather your perceptions related to Flipped Classroom at higher institutions. Your honest responses will be greatly appreciated and will contribute significantly to the success of this study. Your responses will be kept confidential.

Demographic information

Name (optional) _____

Department _____

Program _____

Semester _____

Note: carefully read the statements and tick the box against each statement to your level of agreement.

For each statement item below, please tick the relevant block

SA	A	N	D	S. D
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

S. no	Flipped classroom	SA	A	N	D	S.D
	Perception					
1	The flipped classroom method is more engaging than traditional lectures.					
2	The flipped classroom model allows me to better understand the course material.					
3	I prefer watching pre-class videos over attending live lectures.					
4	The flipped classroom helps me to apply knowledge in a more practical manner.					
5	The flipped classroom structure improves my overall learning experience.					
6	Flipped classroom helps to develop critical thinking.					
7	The use of pre-class materials (videos, readings) is beneficial to my learning.					
8	The flipped classroom improved my academic performance.					

Engagement and participation						
1	I actively participate in class discussions.					
2	The flipped classroom structure motivates me to prepare for class.					
3	The flipped classroom increases my interest in the subject matter.					
4	In-class activities help clarify concepts, I learned from the pre-class materials.					
5	The flipped classroom model reduces my anxiety about preparing for in-class activities.					
Use of Technology						
1	The videos and digital materials are easy to access.					
2	Technology used in flipped classrooms (videos, online discussions) is user-friendly					
3	The online materials help me to understand difficult concepts.					
4	I prefer learning through online videos rather than reading textbooks.					
5	Technological issues are barriers for me.					
6	The use of digital tools helps me to become independent in my studies.					

7	I believe that using technology enhances collaboration with peers for learning.					
8	I feel confident using online platforms for flipped classroom activities.					
9	The flipped classroom makes effective use of technology to improve learning.					
If you encounter technological issues, what strategies do you use to overcome them? _____ _____ _____ _____						
Students' Responsibility						
1	Flipped Classroom encourages me to take responsibility for my own learning.					
2	I feel more accountable for my learning in the flipped classroom as compared to traditional settings.					
3	I can manage my time effectively					
4	I feel more confident in my ability to learn independently					
5	I appreciate the flexibility of accessing pre class materials (videos, readings) at any time.					

6	The flipped classroom structure helps me to develop better study habits.					
Teacher support						
1	The teacher is supportive and considerate towards me.					
2	My teacher provides clear instructions for how to access and use pre-class materials (Videos/readings).					
3	My teacher provides useful feedback during in-class activities.					
4	The teacher encourages participation and engagement during activities.					
5	My teacher offers additional resources or help for students who struggle with the pre-class materials.					
Collaboration						
1	I often collaborate with my classmates during in-class activities.					
2	It encourages more group work compared to traditional teaching methods.					
3	Group activities help me to apply theoretical concepts in real-world problems.					

4	It enhances my ability to work in teams.					
5	Collaboration with classmates during class time improves my engagement with the course material.					
6	The collaborative environment in the flipped classroom enhances my problem-solving skills.					
7	Collaborating with peers outside the class enhances my understanding of course material.					

APPENDIX- II

INTERVIEW QUESTIONS

1. How would you describe your understanding of the flipped classroom model?
2. What aspects of the flipped classroom approach do you find most effective for student engagement and learning?
3. What specific tools or resources (e.g., videos, readings) do you use to prepare students before class?
4. How do you structure in-class activities to build on pre-class learning? Could you provide examples?
5. How do you perceive your role in the flipped classroom compared to traditional teaching methods?
6. In your opinion, how do students respond to their increased responsibility for pre-class preparation?
7. How do the perception of BS and MS students, differ in their engagement and learning outcomes in the flipped classroom?
8. What technology related challenges have you faced while implementing the flipped classroom model?
9. How do you address issues, such as students not completing pre-class work or struggling with the flipped learning approach?
10. What strategies have you found effective for enhancing student engagement in this learning model?
11. What criteria or metrics do you use to evaluate the effectiveness of the flipped classroom in achieving learning outcomes?
12. How does this model affect students' critical thinking and problem-solving skills, in your experience?