

# Revamping The Teaching Of Educational Psychology Course: A Shift From Lecture Method To Flipped Classroom Approach

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## Abstract

This study evaluated the Flipped Classroom (FC) approach's efficacy in educational psychology course. To implement FC approach, student-centered learning environment was created in classroom utilizing the Inquiry Based Learning (IBL) activities and recorded lectures on video for students to watch prior to the class. This study aimed to compare the students' performance who attended FC approach and students who studied through traditional lecture-based classroom. FC approach was implemented at Institute of Education and Research, University of Peshawar, and Department of Education, Shaheed Benazir Bhutto Women University, Peshawar. All the prospective teachers from both institutes constituted the population of this study. All the students from the 5<sup>th</sup> semester of the B.Ed. (Hons) program constituted the study's sample. Utilizing pre-test, post-test quasi-experimental method, the students taught through lecture method for the first half of the semester. In the second half of the semester, students were randomly distributed into two groups: experimental and control. The experimental group was taught through FC approach while control group studied through lecture method. Achievement tests were constructed i.e., pre-test and post-test. A paired t-test was applied to measure the difference in mean scores in pre and post-test taken by both the groups. A two sampled t-test was applied to find out the difference in mean scores of the two groups in post-test to see the difference of performance of the two groups. The FC approach boosted active learning and enabled self-paced learning, and also improved peer and teacher interactions. Replacing traditional lectures with the FC approach is the recommendation of this study.

**Keywords:** flipped classroom, traditional lecture-based classroom, active learning, self-paced learning, educational psychology

## Introduction

Over the past decade the concept of student-centered learning has been stressed where students must be actively engaged in allocated tasks, collaborative learning and been responsible for their own learning (Kim et al., 2014). However due to a number of reasons including background knowledge of students, condensed course content, limited class time, exams-

oriented education system and students lack tolerance toward lecturing, may cause a teacher to face difficulties in encouraging students for self-learning. These challenges can be addressed by attempting a FC approach by making students watch video lectures at home; therefore, allocating more hours for engaging the students in student-centered active learning (Herreid & Schiller, 2013).

The idea of FC was first introduced by Bergmann and Sams, in their book “Flip your classroom: Reach every student in every class every day” in 2012. FC approach has been defined variously; Overmyer (2015) maintained that the FC approach is such an instructional strategy that leads and changes the teaching from the group learning space i.e., classroom to the personal learning space in front of desktop (PC). The group learning space is further transformed into an active and interactive learning environment; instructors in classroom supervise students to apply their self-learned concepts and participate actively and creatively in topics to be learned. Stone (2012) established that the purpose of the FC approach is to utilize the class time in dealing with new and difficult concepts while transferring the course content from teachers’ lectures to recording teachers’ sounds and images for students to watch video lectures prior to class time. While during class time, teachers and students build up the concepts through questions answers or discussions and teachers keep encouraging the students to actively learn and make connections of the new concepts to daily life.

It is shown in much research that pupils learn better if they are taught considering their specific learning styles that may be dependent, collaborative, or independent. According to Piaget's theory of cognitive development, learners try to make sense of reality, as scientists do. Cognitive development theory is based on the belief that learners shouldn't understand and use knowledge immediately after they are presented with the information directly for the purpose of acquiring that knowledge. Cognitive development theory argues that instead of acquiring knowledge students should be supposed to construct new knowledge. Therefore, students should be allowed to build their knowledge through their own experiences. According to Piaget's theory, experiences help students' brains form mental models, or schemas.

Assimilation and accommodation can cause these schemas to grow, alter, and become increasingly complex. In FC approach, these two cognitive constructivist tenets are applied. In FC approach model, prior to attending class, the teacher gives the students a video that introduces the information that needs to be learned. Therefore, students will be actively engaged in transmission of knowledge before class. During class students would participate in activities based on concept of inquiry base learning and peer interaction to accommodate the new concepts (Eppard, 2017).

Benjamin Samuel Bloom constructed different levels of learning, which he presented in form of a pyramid, known as Bloom Taxonomy. This structure works as a lens through which we can observe the learning procedure from its lower level of knowledge to the higher level of critical thinking. Anderson later in 1990 revised the Bloom Taxonomy. The new version of Bloom Taxonomy can relate to the concept of FC approach in terms of the two principles i.e., transmission of information and assimilation of information. Therefore the transmission of information may occur independently outside the class, while assimilation of information occurs under teachers’ guidance inside the classroom. As portrayed by the pyramid where lower levels require transmission and higher levels require assimilation of information the middle area requires a balanced combination of both (Talbert, 2012). The concept of IBL is also rooted in constructivists learning theory. It states that students draw their own meanings and construct their knowledge by what they experience personally rather from what is delivered by teacher (Tamim & Grant, 2013). Being a constructivist and advocate of IBL John Dewey was of the view that students must be engaged actively in the learning process. He put forward that if one is doubtful for how learning occurs, get involve in continued inquiry, consider alternative possibilities, and attain one’s own belief raised from personal experience” (Dewey, 1998, as cited

in Mapes, 2009, p.11). Jerome Bruner who also contributed to the theory of constructivists, was of the view that primary concern is making education more related to students' needs at every stage, to achieve this purpose he believed that students should be allowed to dynamically contribute to the learning process.

### Literature Review

The idea of learning is constantly changing, especially as more and more teaching and learning techniques are used to support student learning and autonomy. This is demonstrated by the ongoing emphasis placed on educational policy, which aims to guarantee that both students and teachers have access to the best tools necessary for fostering communication (Al-Samarraie & Saeed 2018).

In a university setting, students are expected to actively engage with the subject on a regular basis with minimal guidance from the teacher (Baragash & Al-Samarraie, 2018). In this case, FC approach is used as a cure, mainly to shift lectures from in-class to pre-class preparation so that in-class time can be fully utilized for active learning activities. Prust et al. (2015) introduced the FC approach paradigm, which holds that students are accountable for their own learning and decisions made before, during, and after class.

Students are encouraged to reflect and have conversations utilizing the knowledge they have learned from each phase of the learning process. In order to obtain the requisite experience for the "in class" phase, where students are assigned a series of learning tasks such as group projects and discussions with minimal direction from the teacher, Students are expected to actively engage with the teacher-provided teaching materials during the "pre-class" hour. In the "post-class" phase, students are then given quizzes or tasks to complete as an enrichment activity to reinforce the knowledge they had learned during the

previous phases. The results of these learning stages drove a number of previous studies (Gong et al., 2020) to validate the FC approach's potential in a variety of learning situations.

This is primarily because it is widely believed that the FC approach paradigm gives students meaningful learning experiences by enabling them to address conceptual problems in a domain-specific setting by making connections between new and existing material. (Yilmaz & Baydas, 2017).

### Definition of Flipped Classroom Approach

The FC approach is when "events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa", according to Lage et al. (2000, p. 32). However, it is not enough to only rearrange the teaching and learning activities to effectively depict the application of this instructional technique. Thus, an attempt is made to characterize the FC approach by Bishop and Verleger (2013). Their description of the "FC approach" calls for the use of technology to support two components of pedagogy: (1) Interactive group learning exercises conducted in the classroom; and (2) computer-based, one-on-one instruction conducted outside the classroom via lectures on video. Their definition is strict when it comes to the need for instructional videos in the component of learning that takes place outside of the classroom.

We may separate the FC approach from some traditional methods of class preparation by using Bishop and Verleger's (2013) terminology. Students used to be expected to read the textbook independently in order to get ready for class. However, lecturing's components, such as professors' explanation and elaboration of concepts, are not present when pupils are asked to read text-based resources independently. Because of this, the FC approach's goal of inverting "the order in which the instructor

participated in the learning process" (Jensen et al., 2015, p. 9) cannot really be captured by this form of students' pre-class self-study. In contrast, professors can expose students to new information and further explain a concept with examples utilizing instructional videos before class meets. Thus, more time in class may be devoted to cooperative learning activities and problem-solving in real-world contexts with the assistance of peers and teachers. Therefore, we see the regular (instead of optional) face-to-face class meetings and the usage of audio or video materials (e.g., instructional videos, YouTube, screencasts, Khan Academy, podcast) for out-of-class learning as the two necessary parts of the flipped classroom method.

### **Benefits of Flipped Learning**

It has been discovered that FC approach has many advantages for both the instructors and learners.

**Enhanced Student Motivation and Learning Perception:** The beneficial effects FC approach appears to have on student motivation and views of the learning experience have been one of the main advantages that have been observed both quantitatively and qualitatively within studies on the topic. Students generally have more favorable perceptions of FC approach environments than traditional instructional methods and environments, according to studies on FC approach and student perceptions (Kim et al., 2014).

Particularly, due to the manageableness of flipped homework, students have stated that they prefer it to regular homework (Talbert, 2014). The learning activities in a FC approach, according to students in a quasi-experimental study by Jensen et al. (2015) in two collegiate science courses, had a greater purpose than those in a conventionally taught course. Overall, students' perceptions of FC approach are largely positive, especially when compared to more traditional methods. This is because students acknowledge

that in FC approach homework is more manageable and learning is more purposeful.

**Extended time for interaction between teachers and students:** Time is a valuable resource in classroom instruction, and it's been reported in numerous studies that FC approach has contributed to the release of additional classroom time, allowing for more chances for student and teacher engagement inside the classroom (Kim et al., 2014). Seery (2015) claims that FC approach is frequently used by teachers since it gives them more face-to-face time with their pupils. Removal of lectures is recommended by Roehl et al., (2013). This extra time can help teachers to better grasp the progress and difficulties of their students. Students who are uncomfortable asking questions during lectures may be able to do so privately with the teacher thanks to the enhanced interaction between the teachers and the students. Another advantage of more time and contact opportunities, according to Altemueller and Lindquist (2017), is that struggling students can get more support. Additionally, according to students, FC approach has improved their ability to engage with classmates and teachers. It is possible to shift direct education from a group context to an individual one, giving teachers greater opportunity to engage one-on-one with pupils. This allows them to attend to the requirements of the students, respond to their inquiries, and provide additional support to those who need it.

**More time for focused learning:** FC approach has resulted in more time being dedicated to active learning activities. Active learning entails getting students to engage in higher order thinking, according to Bonwell and Eison (1991), who defined it as, teaching exercises that have students perform tasks while reflecting on their actions. According to Seery (2015), most research on FC approach shows that teachers used more active learning strategies during class time, especially when it came to problem-solving,

because FC approach opened up more time. Classroom time can be used for active student interactions, inquiry, peer cooperation, and hands-on activities thanks to FC approach according to Hew et al. (2020). Active learning by itself is essential to student achievement because it appears to produce comparable academic outcomes and student responses whether paired with FC approach and traditional lecture-based techniques. FC approach provides teachers more time and flexibility while also giving students more opportunities to engage in active learning in the classroom. Nevertheless, implementing active learning may be crucial to improving student learning regardless of the style of instruction (Jensen et al., 2015).

**Better learning results:** FC approach is reported to provide equivalent or better learning outcomes in students when compared to more conventional teaching techniques, according to numerous research and evaluations of the body of literature. Some research have found that FC approach can greatly increase student learning outcomes, while other studies have found little to no effect or no influence at all. Furthermore, good, or neutral results have been reported in recent evaluations of studies on the impact of flipped learning on student learning outcomes. Even in research that do not support this theory, flipped learning appears to have no detrimental consequences on student learning outcomes. A number of studies have offered data that supports the theory that FC approach may improve student learning. Actually, a number of research show that implementing active learning techniques in the classroom is the most effective way to use FC approach (Hew et al., 2020).

**Positive benefits on lower-achieving students:** Although there isn't enough evidence to draw firm conclusions that FC approach improves student learning outcomes, studies have noted and documented the positive effects that lower-achieving students seem to experience inside FC

approach situations. In a high school Information and Computer Technology course, Kostaris et al. (2017) found that pupils who had historically performed lowest among the participants benefited and improved the most academically. Likewise, Bhagat et al. (2016) found that Students who performed worse in a traditional high school mathematics course made less progress than those who performed similarly in a FC. Lower-achieving kids can gain academically from FC approach, but Nouri (2016) also discovered that these students have a more favorable impression of learning in general.

For children who struggle with learning, FC approach has a variety of advantages, according to Altemueller and Lindquist (2017), including greater flexibility, more opportunity for differentiated instruction, and the capacity to let students advance at their own rate. The improved learning results and views of many lower-achieving students that result from flipped instructional strategies can be attributed to the enhanced flexibility in instructional design that FC approach can offer teachers.

### **Adoption of the Flipped Classroom**

The implementation of the FC approach would result in several structural modifications to how learning activities are carried out. Consequently, FC approach entails several inversions. Below are descriptions of each of these inversions.

### **Inversion of the place**

In the conventional method of instruction, teachers use class time to impart the material from the established curriculum in one manner or another. Students must conceptualize the rules and ideas of any scientific discipline. Teachers may incorporate learning-enhancing activities into lesson plans in addition to teaching the material. However, these exercises also have the same goal in mind, which is to help pupils understand novel ideas. While using the knowledge they have gained independently at

home to complete activities given to them as homework by their teachers (Andrade & Coutinho, 2017).

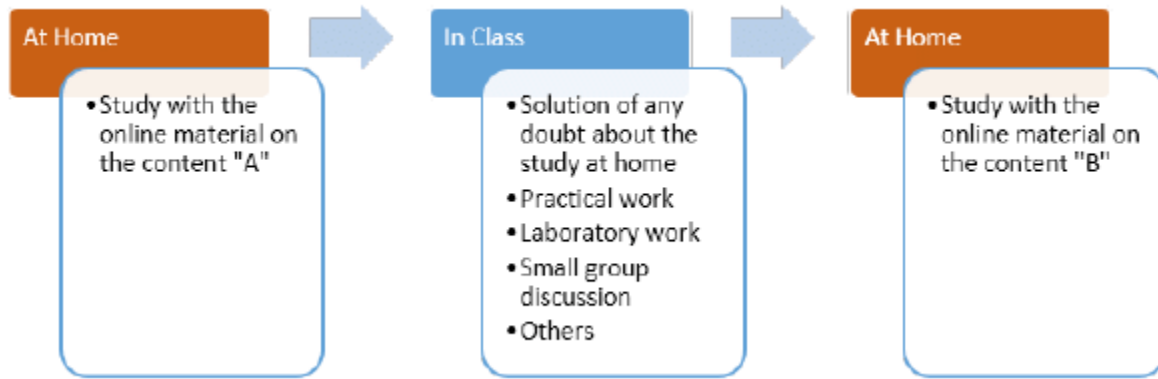


Figure 1: Activity sequence in relation to the place in the traditional teaching.

Source: Andrade and Coutinho (2017). Implementing Flipped Classroom in Blended Learning environments.

In a FC approach, learning environments are switched around. Applying the material gained at home prior to class in activities built around the ideas of self-learning and collaborative learning takes place in the classroom. Instead of simply listening to lectures throughout class, students must actively participate. Teachers create information in the form of films, commented

slides, etc. and make it available for students to watch and understand the topics on their own. This frees up class time for more productive tasks. Students can better regulate their own learning pace in this way. For instance, individuals can play back or reverse the video lesson until they need to listen to it again to fully comprehend it. If students still have questions or concerns, these can be swiftly addressed in front of the professors during class time (Andrade & Coutinho, 2017).

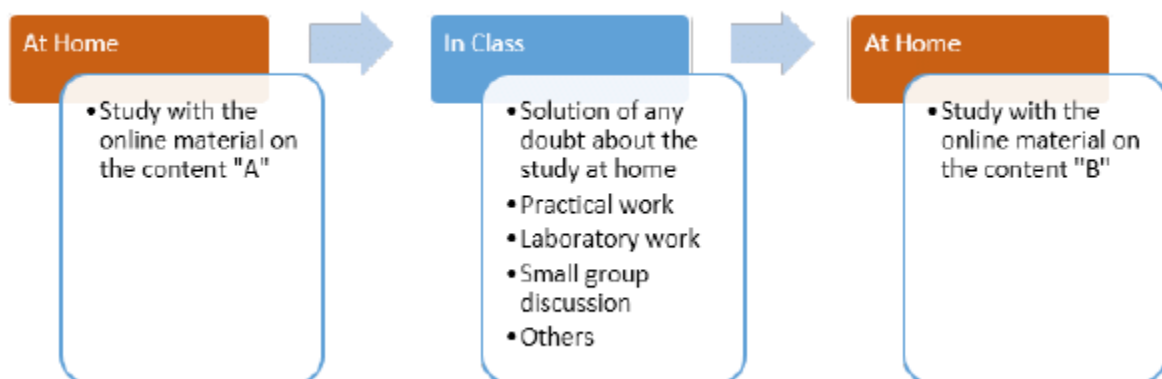


Figure 2 - Activities order in regard to the place in Flipped Classroom.

Source: Andrade and Coutinho (2017).  
Implementing Flipped Classroom in Blended Learning environments.

**Inversion of the time**

The time distribution in a FC approach is reversed, allotting extra time for students to

actively participate in educational activities like problem-solving exercises, laboratory procedures, etc. Regarding this, Bergmann and Sams (2012) provided a time management example by contrasting the scheduling of a typical classroom and FC approach.

**Table 1: Comparison of class time in traditional versus flipped classroom**

Traditional Class		Flipped Classroom	
Activity	Time	Activity	Time
Warm up activity	5 min.	Warm up activity	5 min.
Go over previous night's homework	20 min.	Question & answer time on video	10 min.
Lecture of new content	30-45 min.	Practical and independent guided and/or lab. activity	75 min.
Practical and independent guided and/or lab. activity	20-35 min.		

Source: Bergman & Sams, 2012:15.

**Inversion of the roles**

Description of traditional instruction as "teaching as telling", leads to the conclusion that in traditional instruction teachers play a noticeable role in managing the teaching and learning process, while students serve as passive observers. While under the FC approach, learners play a more central role in developing learning activities that provide students with greater opportunity to be in charge and participate, and teachers are seen as mentors of the teaching learning process (Moreira, 2010).

**Inversion of educational objectives**

According to Bergmann and Sams (2012), learners are required to watch teacher-made videos at home and work on the two lower levels of the Bloom Taxonomy before conducting physical class i.e., remembering and understanding. By doing this, class time can be used to develop high level Bloom Taxonomy abilities, such as applying, analyzing, evaluating, and creating, while being supervised by teachers and working together. The learning objectives

pyramid originally put forth by Bloom was suggested to be reversed by Bergmann and Sams (2012). Thus, in a classroom that is turned upside down, learning would begin at a higher level 'creating' and gradually descends to the most basic level 'remembering'.

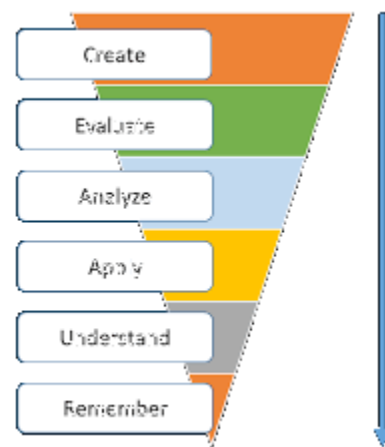


Figure 3 – Bloom's Taxonomy Inverted based on Bergmann and Sams (2012, p. 34)

**Inquiry Based Learning**

Over the past ten years, inquiry-based learning (IBL) has gained popularity as a method of

instruction in higher education. IBL is in line with social constructivist epistemologies, which place a strong emphasis on the subject's active construction of knowledge through their own experiences and the process' inherently social aspect. Research indicates that engaging in this kind of learning helps students enhance their skills and knowledge and gets them ready for life beyond college. Research-and inquiry-based pedagogies have become prominent as strategies that mesh well with these kinds of knowledge-building processes. IBL is a student-centered and active method of instruction that encourages students to conduct independent research projects on topics and issues related to their academic and professional fields, both individually and in groups (Kahn & O'Rourke, 2004). IBL is similar to problem-based learning (PBL), but PBL is usually more open-ended than IBL. PBL involves giving students a problem with a known solution and having a facilitator walk them through the process of solving it. This suggests that students usually have more freedom to select the questions they will answer and the strategy they will use to answer them in an integrated body of knowledge context. Although PBL is problem-driven and IBL is generally question-driven, there are variations based on the field, level, and the teaching philosophies and methods of particular academics. Similar to PBL, the inquiry-based learning strategy for students involves a significant amount of teamwork and is often supported by a facilitator. The claim that students don't receive adequate guidance and support for their learning has been the basis of some criticism directed towards IBL, PBL, and other constructivist teaching and learning approaches. However, this criticism is founded on a false interpretation of the pedagogies' core principles, which state that the goal is to give students an organized and supportive atmosphere in which they may finish their work rather than to leave them on their own. Students who receive insufficient help and guidance are not the result

of inquiry-based or problem-based pedagogies per se; rather, it is the result of poor teaching. The development of the disposition towards "self-authorship," an outlook that entails questioning credible sources, moving away from comfortable worldviews to investigate multiple perspectives, and formulating one's own beliefs and values, is becoming recognized as one of the most desired outcomes of a university education (Loizou & Lee, 2020)

Research-based pedagogies and IBL have been proposed as effective approaches for helping students acquire these kinds of knowledge, abilities, and dispositions. These are necessary for navigating a complicated and changing environment. The ability to be one's own author is essential for achieving most of the benefits of higher education, including intercultural maturity, critical thinking, decision-making, an ethical perspective, and responsible citizenship. According to recent IBL research conducted at the University of Sheffield in a range of arts and social science subjects, students experience these benefits most acutely during their first year at the university, as opposed to when their studies concluded, as has historically been assumed (Levy & Petruilis, 2012).

### **Implementation of the Flipped Model Using the IBL**

IBL is related to the constructivist method, in which students create their own knowledge. According to Holbrook et al. (2014), IBL is a model for classroom activities that involves students actively searching out information and new understanding. IBL is a set of student-centered tactics in which students have more influence over their education, build knowledge through interactions, and apply that information to solve problems in the real world. Students who participate in group projects or independent learning activities actively learn 21st-century abilities including creativity, problem-solving, and critical thinking. Due to its capacity to



motivate and include students in scientific studies to find solutions to social-scientific problems, IBL in science education has received widespread support from researchers. IBL has thus drawn a lot of interest due to its impact on student learning outcomes. Numerous studies have discovered that IBL improves academic performance fosters the growth of critical thinking and problem-solving skills, and allows students to explore, communicate, and discover knowledge and obtain a deeper understanding of the content (Herawati et al., 2020).

### **Components of the Flipped Classroom**

There isn't a single necessary modality for pre-class exercises in the FC approach. The pre-class exercise, as opposed to the in-class lecture in the traditional instructional approach acts as the introduction to new knowledge in the FC approach. According to several studies (Miller & Grooms, 2018), new knowledge can be introduced through instructor-recorded video lectures, field-expert films, solo or group reading exercises, and more. The education that would typically take place in the classroom is now delivered prior to class, in contrast to the standard classroom pre-training exercise. Students now do exercises that use the knowledge they learned in the pre-class activity to the in-class section of the FC approach. This reversal of initial instruction and knowledge application is the main distinction between FC and traditional classroom approaches. Students may practice the exercises alone or in groups with other students. The teacher then steps in to assist students by responding to their inquiries and dispelling any apparent misunderstandings. The FC approach's after-class component's design can also change. To prolong classroom practice; however, is the aim of all extracurricular activities. Depending on feedback from peers or the teacher, students may choose to practice further, complete any unfinished issues from the in-class activity, or be

given more problems to solve (Schell & Mazur, 2015).

### **Psychology Flipped Classroom**

Few research has specifically addressed psychology courses, despite the fact that the FC approach paradigm has been employed in a wide range of academic fields (Sletten, 2015). Talley and Sherer (2013) compared the results of students who took a psychology course, which included online video lectures and in-person practice exams, to those of students who took the same course in a traditional lecture-based classroom during earlier semesters. Researchers discovered that FC approach considerably outperformed traditional classrooms in terms of student exam performance.

### **Flipped Classroom and Active Learning**

Active learning is defined by Bonwell and Eison (1991) as educational activities in which students do tasks while reflecting on their actions. Practitioners have used this in a variety of ways, such as during break-out sessions during lectures or by actively completing classwork assignments. Some people believe that it is more a method of teaching than a distinct model because of the broad scope of its application. Nevertheless, a lot of research suggests that active learning improves student learning, active learning is recommended by Andrews et al., (2011) to improve student learning, while Berret (2012) contends that the FC approach also benefits from active learning. Conscientiousness and focus are cultivated in an active learning environment, and these traits have been linked to greater learning. It has been demonstrated that the FC, which aims to integrate active learning experiences in face-to-face settings, increases students' engagement, particularly when combined with collaborative learning activities.

## Flipped Classroom and Collaborative Learning

In contrast to rigorous lecturing, the FC approach fosters chances for cooperative and collaborative learning. Collaborative learning is described as a setting in which two people or a group of people undergo the learning or effort to learn something jointly. Collaborative learning, being a form of active learning, offers a broad definition that encompasses a variety of approaches. Collaborative learning generally results in better accomplishment in learning than individual learning. Collaborative learning is frequently possible in face-to-face classes because of the emphasis on active learning techniques. Collaborative learning can provide excitement and fresh learning opportunities to a FC approach (Tolbert, 2020).

## Methodology

Using pre-test post-test quasi-experimental method FC model was developed by the researcher and implemented as treatment. FC approach and traditional lecture approach were the independent variables of the research while the students' academic achievement (i.e., marks of students in post-test) was the dependent variable. The study involved two groups i.e., experimental group and control group, the experimental group was taught through FC approach, and control group was taught through traditional lecturing. The students' academic achievement was measured by administering a test before and after the treatment i.e., teaching through FC approach.

Table 2: Design for conduction of pre-test post-test quasi-experimental research:

		Pretest	Treatment	Posttest
Experimental group	Rd	Achievement Test	FC	Achievement Test
Control group	Rd	Achievement Test	TL	Achievement Test

Note: Rd = Random Assignment; FC = Flipped Classroom; TL = Traditional Lecture

## Population and Sample

Having all the university students around the country as target population but keeping in view the feasibility of researcher in term of time constraint and accessibility, prospective teachers from two Public Universities at district Peshawar were considered as the accessible population of the study. Therefore, all the prospective teachers from Department of Education Shaheed Benazir Bhutto Women University and IER, University of Peshawar constituted the population of this study. In this study, the purposeful sampling strategy is applied. Educational Psychology is being taught to the 5<sup>th</sup> semester of B.Ed. (Hons) program. Therefore, to observe the difference of performance in the course of educational psychology all the students of 5<sup>th</sup> semester were considered as the sample of the study.

## Data Collection Procedure

For students in the experimental class, the researcher created course materials that included video lectures, PowerPoint slides, reading materials, and assignments. She then shared these resources on the researcher's personal YouTube channel and WhatsApp groups. With the exception of the films and internet resources, the control group received the same materials throughout the investigation. The same teacher used the standard lecture method in the control class to give directions to both classes regarding the material, tasks, assignments, and quizzes. On the other hand, the experimental class was given instructions using the FC approach incorporating IBL activities. Experimental group saw twenty to twenty-five-minute videos on educational

psychology topics at the start of each week. Using IBL-based activities, teachers engaged experimental group in discussion about the idea using video content. The next set of exercises for experimental group involved group or individual reflection on the material to strengthen the fundamental ideas. The control group took classroom tests and assignments or homework to gauge their comprehension of the material. Both groups underwent an academic achievement test to evaluate their learning outcomes at the conclusion of the intervention. All participants in the experimental class participated in a semi-structured interview to find out their opinions

about the FC approach incorporating IBL activities and students' receptivity and motivation in educational psychology learning using FC approach. The interviews were conducted and audio-recorded via WhatsApp after participants were informed of the aim of the interview and their agreement was obtained.

### Flipped Classroom Model

After literature reviewing and extant analyses of different available FC model, the researcher developed the following FC model, displaying the out of class and in- class activities.

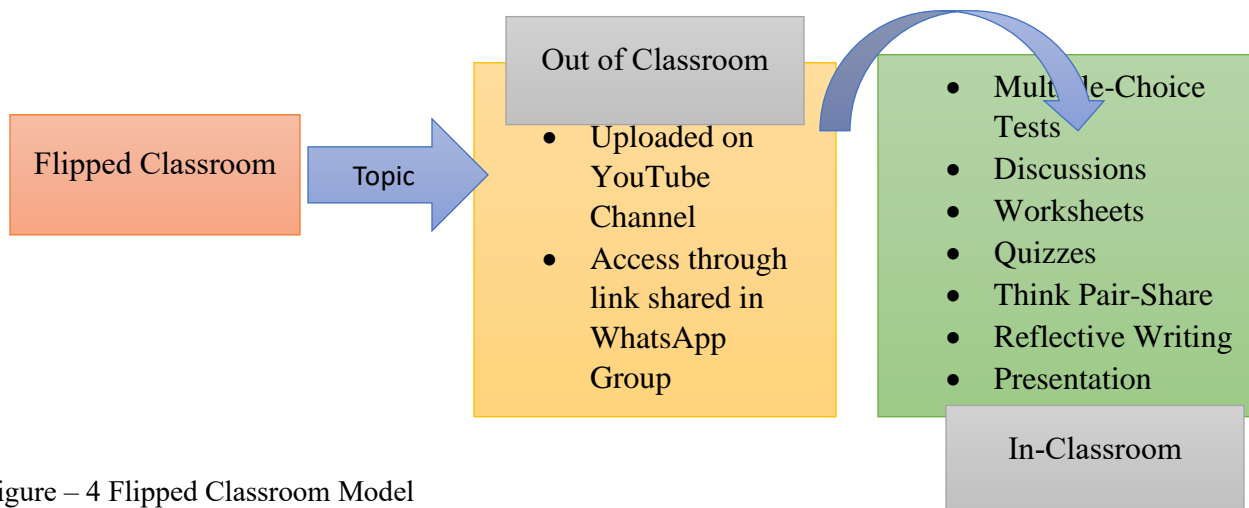


Figure – 4 Flipped Classroom Model

The researcher prepared power point slides for each topic from the course of educational psychology. Using OBS Studio video lectures were recorded utilizing the prepared ppts. A YouTube Channel was created by the researcher named “Educational Psychology”. Researcher uploaded the lecture videos on the channel weekly. A WhatsApp group was created to share the URL addresses of the videos with the students constituting experimental group.

### Out-of-Class Activities

Students received links to films containing instructional materials based on the weekly themes. It was expected of the students to have seen the required movies before entering the classroom. Students were also instructed to ask queries related to the topic in WhatsApp group. Figure 2 illustrates one of the videos entitled "Emotional Intelligence" From the unit “Intelligence”.

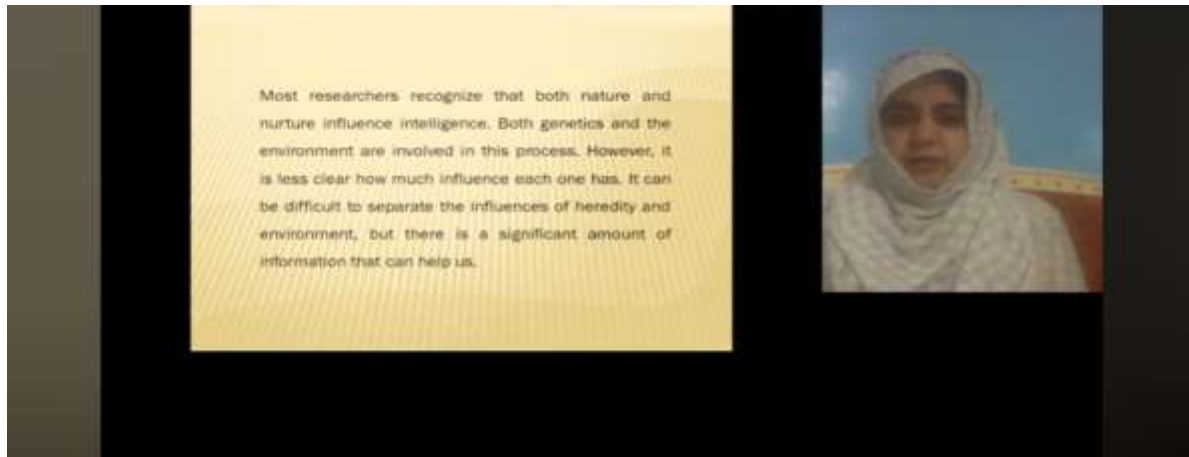


Figure 5 - Screenshot of a video view, [https://youtu.be/GInGx1Bixrs?si=BHeGsb-VDU\\_CGPaW](https://youtu.be/GInGx1Bixrs?si=BHeGsb-VDU_CGPaW)

### **In-Class Activities**

In-class activities included group discussions, think pair share for completion of worksheets, analysis of the content learned before class, quizzes, and multiple-choice tests etc. According to the need of the topic learned out of the class activities were designed by the researcher and students were expected to engage in these

activities for extended periods of time. Following IBL, such tasks were given to the students which made them think critically and analytically. Students were posed with questions and asked to search for answers after discussing with peers. The teacher's role was to facilitate and guide the students during the completion of assigned tasks. Therefore, an interactive environment was provided to the students following the FC model.

**Emotional Intelligence**

**Worksheet # 06**

1. Which of the following individuals connects to the term 'emotional intelligence'?
  - A. Goleman
  - B. Weschler
  - C. Sternberg
  - D. Ekman
2. Rashid is assessed as having high emotional intelligence. This means he has:
  - A. Skills and abilities that help him understand people from another cultural heritage.
  - B. skills and abilities that help him process, understand, and regulate his emotions and those of others.
  - C. skills that help them problem solve
  - D. skills and abilities that help them to acquire language.
3. What are basic emotions related to human beings?
4. What are basic components of emotional intelligence?
5. Why emotional intelligence is important?
6. How self-awareness helps us in our professional life?

Figure 6 - Screenshot of a worksheet for emotional intelligence

## Data Analysis

### Paired Sampled t-test Statistics

This study aimed to know if a new teaching approach i.e., FC approach incorporating IBL activities has any impact on the performance of students in the course of educational psychology. Following the pre-test post-test experimental research method students from both groups, control and experimental group took a pre-test and a post-test constructed from the course content of educational psychology by the researcher/instructor. Control groups were taught through lecture method and difference of the

performance was measured by applying a paired t-test using SPSS version 29. The results are represented in tabulated form and interpreted in descriptive way below. For measuring the difference of performance before and after an experimental treatment, i.e., teaching through FC approach, researcher performed a paired t test using SPSS version 29. Therefore, the test score (pre-test & post-test) of the students who constituted the experimental group was interpreted in terms of p – value to assess the difference of performance before and after the conduction of FC. Hence the following tables show the data interpretation after applying paired

t-test for both control and experimental groups from Shaheed Benazir Bhutto Women University, Peshawar (SBBWUP) and Institute of Research

and Education, University of Peshawar (IER, UoP), respectively.

Table 1- Result of Paired Sampled t-test for experimental group from SBBWUP

	N	Mean	Mean Difference	t-test	P - value
Pre – test	16	20.59			
			-14.00	-7.21	.000
Post – test	16	34.59			

Sixteen students from Education Department SBBWUP constituted the experimental group and were taught through the FC approach. Before conducting FC during the first half of the semester students were taught through traditional lecture method and took a 50 marks pre-test, developed by researcher from course content of educational psychology. During the second half of the semester FC was conducted as experimental intervention, and students learned in interactive environment through inquiry-based learning strategies. Another 50 marks achievement test was constructed and administered by the researcher as post-test at the end of the semester. A t-test was performed by the researcher to see the difference in the mean of students' scores in both pre-test and post-test. The table above shows a significant difference in performance of students before and after

attending flipped classroom. Thus, the test statistic value is -7.21 with a p-value 0.000 which shows a significant difference between the mean scores of pre and post - test. Hence it is interpreted that using the flipped classroom influenced the performance of the students positively, in other words students improved their score after learning through FC. The interactive classroom activities based on IBL helped the students from experimental group to comprehend the concepts of educational psychology and therefore improved their learning. The improved score in the post-test reflected the improved performance of the students after attending FC approach. Therefore, the increase in scores of students constituting experimental group may be attributed to the FC as an effective approach for teaching educational psychology.

Table 2 - Result of Paired Sampled t-test for experimental group from IER, UoP

	N	Mean	Mean Difference	t - test	P - value
Pre – test	13	23.08			
			-7.462	-3.470	.005
Post – test	13	30.54			

Thirteen students from IER, UoP constituted the experimental group who were taught through the FC approach. After learning the course of educational psychology in traditional lecture-based classroom for half of the semester students took a 50 marks achievement test i.e., pre-test. After conduction of pre-test students constituting experimental group were taught through FC approach in an interactive environment and a post-test that was a 50 marks achievement test was conducted. The table above shows a significant difference in the performance of students before and after attending FC. Researcher/instructor performed a t-test to

compare the mean of scores before and after the intervention i.e., teaching through FC approach. The test statistic value is -3.47 with a p-value 0.005 which shows a significant difference between the mean scores of pre and post-test. It revealed that learning through interactive methods in FC approach increases the students' achievement therefore they improve their score in post-test as compared to pre-test. On the basis of the results presented in the table above, the increase in score by students forming experimental group may attributed to the teaching through FC, i.e., implication of FC affected the students' learning positively.

Table 3- Result of Paired Sampled t-test for control group from SBBWUP

	N	Mean	Mean Difference	t- test	P - value
Pre – test	16	20.88			
Post – test	16	33.50	-12.625	6.477	.000

The table above shows a significant difference in performance of students in pre-test and post-test. Students score high marks in post-test in comparison to pre-test. Sixteen students from the Education Department at SBBWUP constituted the control group and were taught through lecture method throughout the semester. Mid-term exam was conducted as pre-test, students took a 50 marks achievement test developed by researcher from the course content of educational psychology. Similarly final-term exams was considered as post-test whereby students took a 50 marks achievement test without changing the teaching approach. The above table presents the results of t-test applied to the mean of test scores in pre-test and post-test. The test statistic value is

6.477 with a p-value 0.000, which shows a significant difference between the mean scores of pre and post-test. Hence it is interpreted that students improved their performance in educational psychology in post-test although no intervention was made, and same lecture method was used throughout the semester. It is; therefore, seen that the familiarity with basic concepts covered for mid-term enhance the students learning and concepts comprehension in course taught for final term i.e., post-test. Scoring less in pre-test may trigger the motivation of students to work harder to improve their score in post-test may also be one of the reason for improvement in test score of control group.

Table 4: Result of Paired Sampled t-test for control group from IER, UoP

	N	Mean	Mean Difference	t test	P - value
Pre – test	13	21.0750			
			-6.67500	2.927	.010
Post – test	13	27.7500			

The table above shows a significant difference in performance of students constituting control group at IER, UoP, in pre-test and post-test. Following the procedure pre-test post-test experimental research students forming control group took a pre-test and a post-test without any intervention. A paired t-test was then performed to see the difference of performance at the end of the difference, i.e., whether students were able to perform better in post-test while no intervention was made. The test statistic value is 2.927 with a p-value .010, which shows a significant difference between the mean scores of pre and post-test. Thirteen students from IER, UoP constituted the control group who were taught the course of educational psychology through traditional lecture method without any intervention, throughout the semester. It shows that learning through interactive methods in FC increases the students' achievement therefore they improve their score in post-test as compared to pre-test.

### Two-Sample t-test Statistics

Two groups in this study; control group and experimental group were taught the course of educational psychology, collectively in same classroom through lecture method up-to mid-term exams. Considering the mid-term exams as pre-test, students were then divided randomly into control and experimental groups and were taught separately in different classrooms. The control group continued to study the course of educational psychology through lecture method on the other hand experimental group was taught through FC approach. To see the difference of performance between control group and experimental group a 50 marks test was conducted at end of the semester. The score of the test was interpreted in terms of P-value by performing two sample t-test through SPSS version 29. Therefore, the tables below display the results of two sample t-test for both control and experimental group from IER, UoP and SBBWUP respectively.

Table 5 - Result of two-sample t-test for experimental and control group from IER, UoP

	N	Mean	Mean Difference	t-test	Sig. (2-tailed)
Control Group	13	27.77			
Experimental Group	13	30.54	-2.77	-.578	.568

The control group was taught through traditional lecture method throughout the semester, while experimental group was taught through FC approach after mid-term. Both groups took the

same 50 marks test at the end of semester. Although the two groups were taught through different strategies students from both groups improved their scores with insignificant



difference. The test statistic value is  $-.578$  with a  $p$ -value  $.568$  which shows that the difference between mean score of control and experimental group is insignificant. The performance of both groups in the post-test indicated that teaching

through FC approach made no significant difference in performance of experimental group while comparing with the performance of control group taught through lecture method.

Table 6 - Result of two-sample t-test for experimental and control group from SBBWUP

	N	Mean	Mean Difference	T test	Sig. (2-tailed)
Control Group	16	33.00			
Experimental Group	16	34.71	-1.706	-1.009	.321

The control group comprising sixteen students were taught through traditional lecture method throughout the semester i.e., without any intervention. At the end of semester students took a 50 marks test. On the other hand, the experimental group comprising of same seventeen number of students was taught through lecture method during first half of the semester and through FC approach during second half of the semester. Students from the experimental group also took the same 50 marks test at the end of semester. Now the performance of both groups in post-test is compared in terms of  $P$ -value and it is observed that there is no significant difference in their performance. The test statistic value is  $-1.009$  with a  $p$ -value  $0.321$  which shows an insignificant difference between the mean score of post-tests of control vs experimental group from SBBWUP. Therefore, it is revealed that utilizing the FC approach for teaching the course of educational psychology made no difference in students' performance.

### Findings

1. There is a significant difference ( $t=-7.21$ ,  $p>0.05$ ) in performance of students constituting the experimental group I, before and after attending FC. All the students

constituting experimental group I, improved their score in posttest to an evident extent.

2. There is a significant difference ( $t=-3.47$ ,  $p>0.05$ ) in performance of students constituting the experimental group II before and after attending FC. All the students constituting experimental group II also showed visible increase in score of posttest.
3. There is not statistically significant difference ( $t=-.578$ ,  $p<0.05$ ) between the performance of experimental group I and control group I. Though every student showed improved performance in the posttest as compared to pretest but the difference of score of posttest between the two groups is not significant. It means both the groups improved their performance almost equally. This revealed students who experienced the FC approach setting didn't outperform the students in the traditional lecture-based class.
4. There is not statistically significant difference ( $t=-1.009$ ,  $p<0.05$ ) between the performance of experimental group II and control group II. All the students constituting both groups improved their performance in posttest, experimental group II marked no difference to control group II.

5. This result revealed that as there is no significant difference between the performances of the two groups, the improvement in score of posttest of both groups cannot be attributed to implication of FC approach. Other factors like increased familiarity with course content, students' interest might be triggered after studying educational psychology in the first half of the semester or the pattern of pretest might guide to perform better in posttest.

### Discussion

This study aimed to investigate the impact of FC approach on the performance of students in the course of educational psychology. Therefore, researcher developed an FC model comprising the course content of educational psychology in the form of video lectures that students from experimental group were supposed to watch prior to class. For in class activities researcher designed activities based on IBL. After implementing the FC students' performance was compared in term of test scores. Thus, test results from the experimental and control groups served as the quantitative data that the researcher collected throughout the study's initial phase. The study's conclusions showed a considerable increase in achievement, or test scores from the pre- to post-test, although there were no appreciable variations in score increases between the two groups. It revealed that FC approach didn't affect students' achievement in term of test score. Both groups, control group taught through traditional lecture method and experimental group taught through FC approach showed same improvement in performance in posttest. This finding differs from earlier research where the experimental group usually did better than the control group. The means of the portions taught in the traditional method group scores were lower than the means of the sections taught using flipped techniques, according to the findings of Overmyer (2015) entitled, The Flipped

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According to this study, there is no discernible difference in scores when the FC approach and IBL activities are combined, although there are advantages in terms of creating positive learning environments and encouraging critical thinking. This result is in line with earlier research findings, such as Sheerah and Yadav (2022) entitled, The Use of Flipped Learning as Technology Enhanced Pedagogic Tool to Support EFL Students' Writing Skills in Saudi Context, which found no statistically significant difference between the arithmetic averages of female students in the post-application of the test for the improvement of English writing and its five fields, introduction and results, axes, organization, citation and mechanism, at the significance level of  $\alpha = .05$ , that can be attributed to the interaction between teaching strategies (the usual method, the invert learning method) and educational achievement levels (excellent, good, medium, and poor). The interaction between the layout and citation variables' calculated values (0.0410 and 1.220) are not statistically insignificant ( $\alpha = .05$ ), indicating that the preparatory year students' improvement in their English writing does not depend on their educational achievement levels. Regardless of the academic standing of the female students in the preparatory year, the implementation of the inverted learning technique has a noteworthy impact on the enhancement of their English writing skills. This showed that, regardless of their achievement level, students who participated in the flipped learning environment fared better in terms of writing proficiency than students in the standard writing class. The hypothesis was thus accepted, stating that there is no statistically significant difference in the means of the scores between the experimental and control groups about the methods of instruction

and the degree of achievement in writing performance.

### Recommendations

1. In higher education, the FC approach is becoming more and more popular at an exponential rate, particularly among college students. The FC approach unquestionably take the place of traditional lecturing.
2. It is suggested to introduce FC approach early on in order to make it feel more natural to adopt the method and to prevent students from feeling insecure about switching after spending so much time in college.
3. Providing faculty members with chances for professional development on the effective use of the FC approach is essential, as is allocating enough time, technical know-how, and human resources to put the strategy into practice.
4. Teachers' workloads will increase as a result of the shift to a FC approach. One of the most important factors is the return on investment for faculty time. Time investment, however, may be seen as possible quality-improvement initiatives that are required of any professional rather than just as "extra work." The extra effort is accomplished early in the development period, similar to other forms of quality improvement, but it presumably returns to "normal levels" in subsequent years.
5. It makes sense that students might object to a sudden change in the classroom environment from a typical lecture to a FC. It is the responsibility of teachers to guide children toward active learning that prepares them for the future, even though they may first oppose these changes.
6. Students could exhibit some inertia while switching from traditional instruction to FC. Students don't bother making changes if they are already high performers. It can also be distracting for them if they are having

difficulty with their studies. However, variety is essential for inspiring and motivating pupils to learn in the classroom. Teachers may use a variety of teaching strategies to encourage and inspire a positive attitude toward learning. Therefore, strengths of FC approach may be utilized for change along with other interactive teaching approaches.

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