



RESEARCH PAPER

The Flipped Classroom: A Teaching Model for Teacher Education

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ABSTRACT

The Purpose of this study is to introducing flipped learning strategy to novice Pakistani teachers and exploring their perception and views about its effectiveness. The investigators used case study as a qualitative approach to get deep knowledge about the phenomenon under investigation. Design Base Research (DBR) was employed for the intervention of flipped classroom learning model for a teaching course offered at post graduate level in a public university. Multiple tools like structured observation, field notes, questionnaire and face to face interviews were employed for data collection. The analysis consists of three parts: first part deals the analysis of observed classroom practices, second part discusses about the change of attitude due to intervention and third part talks about the analysis of students' interviews conducted at the end of the study to further explore the effectiveness of flipped model. The qualitative and quantitative analysis shows that flipped pedagogy is a productive teaching approach in Pakistani context by considering of some factors like relevant content and size of videos, layout of classroom and role of teacher

Introduction

Since A Plethora of research (References) advocates the usefulness of flipped classroom pedagogy and therefore is being practiced all over the world but unfortunately in Pakistan teachers are not much familiar with it. And even no evidence is available about its effectiveness in Pakistani context. In Pakistani educational institutions the approach of teaching is traditional in which teachers lecture and lead activities and students complete their assignment after listening a lecture. It promotes rote memorization and student focus is only to retain the

information for examination. Students in this context come to class and rarely try to one-on-one discussion with teachers (Springen, 2013).

On the other side teachers at school, college and universities level wish to change their traditional way of teaching into student-centered style of teaching approaches. It is an era of technology therefore digital pedagogies are being practiced throughout the world to meet the needs of times. A flipped classroom is a step towards digital pedagogy in the classroom. Many researches advocate flipped classroom strategy which enhances student accountability for class attendance and preparation. In flipped classroom students are more interested in using smart phones and laptops. However, outside the classroom teacher ask the students to watch video which is given by him. He himself also debrief during a lecture. Whereas, inside the classroom students shared the things what they have watched and listened by the teacher. Moreover, teacher asks the questions from the whole class from the videoed and shared content. One of the key elements is the teacher's ability to provide just-in-time advice and correct logical fallacies before they take hold. Students are encouraged to complete assignment as homework and come next day to attend the class for instructions and content. On the other hand in traditional method, teacher complained that students come into class ill prepared, incomplete homework and without reading assignments. I assume that a flipped classroom is an alternative learning model in Pakistani context.

My Flipped Design (Intervention)

Flipped is an inverted classroom and have flexible design. As Hamdan et al. (2013, p.15) state that it is a flexible model in which teachers use different tools according to the context to meet individual students' need. The researchers also have to change the project classroom due to some reasons. Videos were shown in the classroom and after those other activities were completed for example, students discussed their idea with peers and summarize their conclusion in written form and filled a questionnaire in groups, provided by teacher. Furthermore student can rewind and stop video in classroom whenever they needed. Researchers kept the environment flexible and all required technology was available in classroom. All necessary content provided in classroom. The researcher make class layout in groups for discussion because collaborative learning is base of this model. This is the design used for intervention of this study.

Role of Teacher and Students in Flipped Classroom

The planning and the actual environment in both flipped learning and the traditional classroom are different. The role of teacher in flipped classroom is as a facilitator and guide which ensures that students are learning what they are required. Teacher designs overall learning structure for successful implementation of flipped model, discussing student and pictured his role clearly in the light of students' centred pedagogical approach. He/she manages all digital equipment and devices required for flipping. He/she generally plans instructions and

homework activities. And it is his/her responsibility to follow the instructions and to provide the relevant high quality instructional videos and content to the students before the class. The students watch the videos independently in the first half of the lesson and discuss about their ideas in the second half.

For students' motivation and preparation, teacher arranges in-class and out-class components necessarily carefully integrated to understand the model (Educause, 2012). He guides the students that they can search more videos on internet and watch for further clarity of their concept. Furthermore he facilitates inside the institution in accessing of the relevant information regarding the content if needed. Teacher encourages and motivates the students to participate in class activities and debriefing session.

Mostly half circle classroom layout is being used for discussion session. He also works with students in small groups and look for opportunities to individualize learning by using different groupings in the classroom. To get evidence of the effectiveness of this model on students, researcher decided to flip the twenty sessions.

For the assessment in flipped classroom and ensuring a successful flipped classroom, a quiz is essential as a formative assessment because it is a way to check the understanding of content that learned outside classroom. Sometimes questioning after debriefing is necessary in flipped classroom, but it should be based on exploratory and augmented nature, connected to content, focused and demanding higher cognitive thinking.

Material and Methods

The researcher used case study as qualitative approach to get deep knowledge about the phenomenon under investigation. As Schell (1992) states that the case study is the most adaptable of all research plans, permitting the researcher to hold the all-encompassing qualities of real-life events while exploring observational events. Researchers intervened flipped learning model for teaching Education Psychology course to M.Ed. class in a public university. Researcher used Design Base Research (DBR) rather than experimental research for intervention because in experimental one have to control the variables (Brown, 1992; Collins, 1992) which is not essence of qualitative research. DBR is a rising worldview for the investigation of learning in setting through the methodical outline and investigation of instructional methodologies and tools. The study was conducted in natural environment without controlling any variable.

Site and Selection of Participants

The researchers collected the data from a public multi-campus teacher's education university which was established to bring quality change in teacher education. The researchers took purposefully and conveniently M.Ed. class to

teach Educational psychology and guidance course. The objective of taking this course(credit hours 3) as an intervention was to solve classroom behavioural problems by using management strategies and principles of learning through flipped model. Twenty six students were enrolled in M.Ed. class.

Tools for Data Collection

There is an extensive sort of instruments used for data collection however, researchers feel structured observation, field notes and face to face interviews are appropriate techniques to collect the data from multiple sources. The data can help to understand the phenomena under investigation in better way.

Structured Observation: Structured observation forms were used to analyse the practices of flipped classroom. To avoid ambiguity the observational form were again matched with the video recording. Students' recording of verbal and nonverbal behaviour inform about their learning. One observational form was filled after two sessions. As Patton (1990) recommended that observational data empower the researcher to enter and comprehend the circumstance that is being described.

Interviews: Ten students were selected on the basis of their learning abilities e.g. some are very cooperative and some are problematic during intervention. The interview questionnaire consists of 12 to 16 questions. The length of each interview was approximately 15-20 minutes. These semi structured individual interviews facilitated to know the students' views and their behaviour about the flipped model implemented. Further it helped to explore the challenges that occur in the class. The interviews were audio recorded with the permission of the respondents.

Field Notes: In our point of view in site field notes played an important role in data collection. Everything in every episode cannot be remembered that's why note down it. I take the notes during period through observation to provide a record of the activities. My purpose is to reveal about the particular context and conditions after observing the students' interaction from their verbal and nonverbal behaviour on different activities when learning environment occurs. Field notes gave a lot of information about subject during analysis. Moreover, it assisted to make a framework of research problem during data analysis.

Questionnaire: we adapted questionnaire to measure the change in students' attitude. The questionnaire comprises of 21 items on a four-point Likert scale and participants were required to select one option against each item. Questionnaires were given before and end of the intervention to analyse the change into their attitude towards flipped pedagogy.

Results and Discussion

The analysis section consists of three parts. Part-I deals the analysis of classroom practices, part II discusses about the changes of attitude if occur with the implementation of flipped pedagogy and Part III, talks about students' interviews conducted from participating students to know the effectiveness of this model.

Part I: Analysis of Classroom Practice

Analytical Framework

The framework was used to analyse the productivity of the intervention consists of six categories; (i) video lesson, (ii) face to face application, (iii) instructor interpersonal skill, (iv) student behaviour, (v) instructor student and student interaction and (vi) learning objectives. The first category 'video lesson' is divided into four sub categories; (a) introduction, (b) presentation phase of lesson, (c) images and figures and (d) consolidation. Second category is also divided into four sub categories; (i) preview (ii) practice phase of lesson, (c) teaching technology (d) wrap up. The framework was used to measure quantitatively each statement in a category. After that Percentage of each category score was calculated, which shows the productivity of intervention?

Qualification to Quantification of Framework Data

- Interpretation of score. The following key (Table.1) score was used to analyse each statement. The maximum score of each statement is 4 and minimum is 0. Total score of each category is calculated for interpretation.

Table 1
Key of Interpretation of Scores

Scale	Score
Yes	4
Mostly	3
Partially	2
No	1
Not Applicable	0

Percentage is calculated by the following formula of all categories of each episode.
Percentage of Statement= Obtained marks ÷ total marks × 100.

Table 2
Statistical Analysis of Intervention

Sr.#	Category	Sub-Category	Epi-1 Per	Epi-2 Per	Epi-3 Per	Epi-4 Per	Epi-5 Per	Epi-6 Per	Epi-7 Per	Epi-8 Per	Epi-9 Per	Epi-10 Per
1	Video Lesson	Introduction	50.0	58.3	75	75	100	100	100	100	100	100
		Presentation Phase of Lesson	61.0	69.4	86	91.7	83.3	91.7	92	92	92	92
		Images and figures	75.0	82.1	89.2	89.3	92.9	82.1	93	88	88	90
		Consolidation	62.5	75	37.5	100	100	62.5	100	100	100	100
2	Face to Face	Preview	50.0	50	55	70	70	70	72	70	72	72
		Practice Phase of Lesson	66.1	62.5	96.4	83.9	76.7	71.4	75	75	82	82
		Teaching Technology	62.5	68.8	100	81.3	81.3	81.3	82	83	81	83
		Wrap-up	25.0	50	75	50	66.7	75	76	77	78	78
3	Instructor Interpersonal Skills	83.3	75	83.3	62.5	79.2	87.5	82	88	89	89	
4	Students' Behavior	68.2	68.2	84.1	70.5	81.2	59.1	82	83	84	84	
5	Interaction	75.0	50	68.8	79.2	95.8	95.8	96	96	96	96	
6	Learning Objective	81.3	62.5	81.3	62.5	81.3	37.5	82	81	82	84	

Interpretation of Intervention

Video Lesson

a. **Introduction of lesson.** Almost in all episodes except episode 1&2, the researcher shared the objectives, format and outlines of the lesson in the beginning of the lesson. However, the students appeared confused, uncomfortable and less motivated towards learning in first two episodes as compared to the rest of episodes. They asked from the teacher ‘what are we going to study today’? Even this type of questions shows implicit motivation towards learning.

b. **Presentation phase of lesson.** The pace of presentation was set in almost in all episodes according to the students’ understanding level which supported the learning. The researchers hunted all the videos from the World Wide Web for intervention. The length of each video was approximately 8-10 minutes. The duration of videos was appropriate because students concentrated on the content during watching of them. The videos used were easy to watch and understand. Students took the notes which later facilitated them to ask the questions from the teacher. The videos were displayed in two parts in few episodes. The second part

was displayed after the discussion on the first part. The teacher replayed the videos whenever students requested.

Images and figures were explaining the concept. Appropriate amount was displayed at one time. Format was good. Videos were clear and self-explaining, therefore students did not ask for explanation. Search of relevant videos was not an easy task. Students can make notes and understand the material easily. The videos used for intervention belonging to native English speakers so sometimes students felt problem in understanding of English accent. They can access videos when they need.

Consolidation Teachers could not find sufficient time for consolidation, but in few episodes students appeared very enthusiastic when a comprehensive overview was given. It was opposite of teachers beliefs when they think students are matured and there is no need to give the overview of session.

Face to Face Application

Students mostly reached late in the classroom due to three consecutive classes. Students want some break after first period so they went for refreshment.

In first episode students were hesitating to share their experiences. Teacher provided the agency to ask questions.

After presenting single information, I explained it myself. So they can understand easily. Group discussion and questionnaire was given to solve. In all episodes only these two techniques were used. Questionnaire solving activity supports success with learning objectives and this activity was according to level of students.

(a) Practice phase of lesson. Visual medium was appropriate for all episodes. In all episode material were complement illustrated and explaining. Videos were uncluttered, only single information was delivered at once.

(b) Wrap-up. In every episode wrap up was given to the students which facilitated them in further understanding the understudy concepts.

Instructor interpersonal skill

The instructor interacted with the student properly and used respectful language in almost all episodes however only in first episode body language of instructor was not much confident as required.

Students' Behaviour

Students were very happy and excited when teacher shared the methodology of intervention with them. Students appeared very attentive in watching video and later in discussion session however in some early episodes they could not connect their thoughts to the content which was under discussion. They participated well and listened to each other's ideas keenly. The language used during discussion session was exploratory and argumentative which influenced them for collaborative work.

Instructor-Student and Student-Student Interaction

In this segment students were divided into small groups for collaborative work. It was required to answer the application type questions given at the end. The role of instructor was as a facilitator therefore she provided process help in the zone of proximal development. This type of context helped the students to remove their ambiguity appeared after watching videos. Moreover, their talk was exploratory during collaborative group work which is an evidence of productivity (Qaisar, 2015).

Learning Objectives

Almost in all episodes the objectives were achieved set before the lesson. This is another evidence of successful intervention.

Part II.

Students' Attitude towards Flipped Classroom

Table no 3 presents the mean difference of each item observed before and after the intervention.

Table 3
Analysis before and after the Intervention

Questions	Mean Before	Standard Deviation Before	Mean after	Standard Deviation After
1. Overall, I enjoyed flipped Overall, my attitude toward psychology class is positive.	3.472	0.8908	4.001	.8268
2. I enjoyed my Educational Psychology Class	3.203	1.074	3.9112	1.103
3. I prefer to listen to a lectu	3.38	1.213	3.876	1.267

face-to-face.				
4. I prefer using class time for problem solving activities rather than listening to a lecture	3.352	1.07.011	3.871	1.267
5. I feel like I understand the Educational Psychology content taught in the class	3.565	1.087	4.100	1.194
6. I like the ways Educational Psychology is taught in my class.	3.33	1.261	3.892	1.289
7. I feel like I do well on my assignment in Educational Psychology	3.806	1.089	4.210	1.017
8. I know where to get help I get stuck on a Educational Psychology assignment.	4.009	1.163	4.961	1.131
9. I can see that I am improving in my knowledge of Educational Psychology.	2.778	1.217	3.265	1.187
10 I know where to get help.	3.33	1.657	4.116	1.789
11 I watched each video 'typically this many times'	2.907	0.856	3.678	1.348
12 Do you think the flipped classroom technique helped you learn chemistry more efficiently than what was done last semester?	3.411	1.204	4.673	1.897
13 The time spent in class was helpful to your understanding of the concepts?	3.215	1.389	4.546	1.143
14 I had a difficult time following this video content	2.864	1.756	3.659	1.531
15 I felt prepared to complete introductory problems in class after listening to the video content.	3.532	1.071	4.236	1.723
16 I feel that more time needs to be spent at the beginning of class reviewing the video content.	3.623	1.245	4.489	1.653
17 Which of the two types of	3.223	1.342	4.211	1.309

classrooms do you prefer working in? (Traditional, Flipped)				
18 In terms of the amount of content that was flipped, would you prefer more or less?	2.998	0.987	3.672	1.006

The above table presents the positive change of attitude. However it is a slight difference in some questions and a large one in few questions. The results show students felt well and enjoyed learning environment of flipped model.

Analysis of Interview Data

I have taken ten interviews from the project class to get in depth information about the intervention. It was individual interview. In the response of my questions (see appendices). Interviews helped to understand the feeling of the participants and the practices.

The following theme emerged.

a. Feeling about flipped Classroom Technique Good Learning Environment

The responses of the interviewees were encouraging against this pedagogy for example one of the interviewee said ‘there was a good learning environment ..; we learned a lot from videos... another student responded “It was the best activity for conceptual learning. It covered much information in minimum time.

b. No alignment with our Assessment system.

Students said they were feeling problem in annual exam when teachers gave the subjective paper. We understand what is asked from us but we could not write in detail because teacher did not provide the notes for each topic... what we have to memorize...One of the student reply “according to our assessment system we required material for memorizing. By watching this video we came to know what.... it would be a difficult for us to write after using this method”.

c. Videos

Students complained in early episodes about the accent of the English stuff used during intervention because English was their second language so sometimes they could not understand the native speakers’ language. But later it was observed that they were familiar with native accent .Teacher replay the video whenever they said there are not getting. As one of the respondent said, “I feel very good by studying this method, my vocabulary has improved.....I am feeling a bit confidence than before in understanding English language words and accent.... It seems me good by watching

these videos I am feeling that I can understand English movies and cartoon (smiling).”

d. Traditional Beliefs about Learning

Some interviewees believe that It was a good to use technology. Visual aids were used during teaching lesson that facilitated their learning. The students think that the material displayed in videos can be remembered for a very short time however repetition is required to keep in mind for long time. During flipped method lecture it seems like that “we remembered and know everything displayed in video and even answer questions asked at the end correctly but outside the class we feel that we have forgotten everything because we are not used to such type of methodology we have fear that we cannot write in exam until we will not memorize ...”

e. Attitude towards Flipped Classroom

Most of the Interviewees said they enjoyed this way of teaching although It was a new but this method made the subject interesting for them as one said “Flipped teaching method is good and now things are more understandable for me now”.

Significance of Flipped Classroom Strategy

In the response of the question, how much value you give to flipped Classroom strategy most of the interviewees believe that It was very good for modern studies and conceptual learning. As one interviewee states that “I would like to say it should be done in classes”. Ten out of fifteen interviewees said that our understanding was better by watching vides than reading direct text and discussion after the videos facilitated more in understanding the stuff. One interviewee responded, “I would definitely use it to my students if the technology will be available to me”. One of the participant rated this pedagogy quantitatively as he said, “it was an effective teaching method I can give 7 marks out of 10 to this way of teaching ... I will use it myself also for teaching. It was valuable for me but we should not be dependent only on videos. Furthermore teacher should provide the notes of different topics required”

Use of Web Base Instructional Videos

In the response of the question do you like to use the web base instructional videos? 25%interviewee responded that ‘Yes’. As one said that “Yes, I used it, actually I have been to Dubai for a month where I interested the local students using interactive white boards connect the classroom to the entire globe so I love using internet in my classroom and I would appreciated if it is provided in my classroom.”, but other 75% said they never use it.

Educational Psychology Videos outside the Classroom

In the response of the question, how often do you use any time Educational psychology videos outside the classroom? Most of the interviewee said they do not have enough time to watch movies outside the class. it was time consuming.

Positive Aspect of Flipped Classroom Experience

Here are the positive aspects of flipped classroom shared by participants during interviews.

- Concepts clear more
- It was good, I gained much.
- It is an innovative way of teaching by using of technology for learning.
- It was interesting way of teaching, we enjoyed during class but the problem was in making notes after listening videos.
- We learned English language and other positive aspects... we more focused on videos, and remained attentive because we knew that we have to answer the questions at the end of each episode.
- If a topic was difficult, we search more videos and watch. It must be beneficial.
- Previous exposure to the videos. I think it would be better if you give the videos before class because as a class represented I must say that most of the students have listening problem. They were not able to understand the content of the videos 100 cent. Also I would say, it would be much better if you provide it they seen to watch at their home. We should come in the classroom with preparation for discussion only.

Instructional Videos

8 out of 10 interviewee believe that Yes, watching instructional videos helped me a lot ...my concepts are clearer than before. Moreover, they said videos were very fluent “ it was beneficial for me in two ways, I was crazy for English, the method has improved my accent and pronunciation”.

Recommend Flipped Classroom to your friend.

In the response of the question; would you like to recommend flipped classroom to your friend? 8 out of 10 interviewee said; “Yes definitely I recommend to our friends because “ this pedagogy developed interest to me,. One of the interviews says I appreciate this method and told to others. I am a teacher and discussed this idea to my head that it should apply in our school. Learning will be improved. On the other side two interview have different opinion they said, we recommend, but not for all topic. Because visual aids are good only for functioning, we can use it but, not on daily basis. For difficult topic or scientific project, video should be used. One interviewee believed that it should “not be used at school level because there will be

language problem. However if we solved language problem, believe me even any single kid will not be absent from class”.

Motivated to learn Educational Psychology

Almost all the interviewees said they were more motivated towards Educational Psychology course because it became interesting course and improving our participation and engagement in the classroom. As one of the interview said “It is more engaging. we were more engaged because we have to note down, listen and understand while in traditional method we sit still and listen that was not effective in university level. We were more participated and involved while in traditional method we know we will get notes.”

Comparison between Flipped and Traditional Method

All of interviewee response that there are major difference between both of method. Flip method was more interesting, engaging, and beneficent. This pedagogy not only gives conceptual learning but also improves their learning. However, our assessment system does not support such type of pedagogy so there is need to revise. Flip method. One student said making notes from this method is difficult. Traditional method is just need notes and memorizes it. As one of the respondents says “It has more benefits with little time and less effort learns more but for subjective type should be provide notes, because our assessment system is traditional. Strategy is very good but we live in rote learning system in which we are assessed our memory instead of concept. We suggest our examination should be modern also. If we improve our system more then there will nothing best” .Another interviewee said “ Flipped classroom became interesting, it eliminate boring atmosphere. It needed concentration. It improved our learning. on the other hand one of the interviewee argue that it was a new method but it has some drawbacks for example by this method making notes is difficult”.

Interaction with Teachers, and Team Members

Interviewees responded on the question how was your interaction with teachers, and team members, this pedagogy helped me to interact more with students and less with teachers. I think it was good as one participants said, “Yes we interact more with teacher, especially at end of the video we asked questions to teacher. Interaction was equal with peers because of questionnaire”. as one participant believe that “of course more interaction helps out to eliminate social flaws. We learn to work collaboratively.

Discussion

My discussion had been guided by my study questions; is flipped classroom model productive at university level? It cannot be easy to say in one word “Yes”. Many aspects like videos, content, layout of classroom, tasks and role of teacher are

involved in its productivity. In conclusion flipped classroom proved a productive approach for engagement and sharing ideas and as a result produced learning environment. This strategy changed the students' attitude and they liked it and environment emerged as a result of its implementation. They told they learned such type of environment. The finding of the study are aligned with Jamaludin and Osman (2014) who say, flipped classroom type of learning environment helped teachers to achieve their learning objectives and it makes teaching and learning process more active, engaging and student-centred.

Videos should be relevant to the topic and understandable for the students. Length of video should appropriate, not too long (no more than 20 minutes) or not too small. Lengthy video may be boring and in short concept may be not delivering at once. Teacher should give a brief review of material before starting class activities and later ensures that students have necessary understanding of the material (Sage & Sele 2015). Videos are an effective teaching tool, if used accurately, among technological medium and to support the instruction teacher are using in all over world (Hartsell & Yuen, 2006). In addition, providing videos helpful for absent students. Videos are an option of an option as same main instructions to all students taking the course, as direct from teacher (Enfield, 2013). Students gained knowledge by direct personal experiences likewise activities, projects, and discussions, it relates to constructivist learning. Students have well learning opportunities in technology enriched learning environments (Basal, 2015). Students believed that converting traditional classroom into Flipped classroom is better and enabling students learn and retain information for long time. Flipped classroom strategy was appreciated by students. Flip learning opens a chance to increase successfully students' engagement without requiring any more resources (Schullery, Reck, & Schullery, 2011). Flip classroom is better than traditional classroom relates to students' motivation. Flip classroom is interesting and provide vast occasion for teacher and student to use technology for better advancement. Teacher and students have extensive opportunities to produce content, developing an advanced instructional tool to generate a new pedagogical practices by the use of open source and social media (Osman, Jamaludin, & Mokhtar, 2014).

Conclusion

As a whole, students convinced that they learned, motivated and engaged more in flipped classroom and enjoyed this way of teaching and learning. Students thought that our traditional examination system cannot work with this model. Furthermore they appreciated the videos used during intervention. They also share that these video may be more productive if recorded in native language. This model can be suitable approach at university level.

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