Investigating the Effect of Flipped Learning Based on Information Technology and Smart Resources for Improving Teaching in Practical Courses of Bachelor of Information Technology at Motahari College

Eisa Khodabandeh

Instructor in Shahid Motahari Faculty, Master's Degree in Educational Management and Faculty Member of Imam Hussein University

Eisa_355@yahoo.com

ABSTRACT

In the flipped classroom, what is traditionally done in class and as homework are switched or flipped. The conventional classroom is much of the times sorted out as a spot where the teacher exhibits and clarifies content whilst students listen to and note down the notes. The class is typically teacher centered; however one can have a more dialogic methodology with the students, contingent upon one's own particular viewpoint. Routinely, in the classroom, all students need to do the same exercises, in view of the technological equipment accessible in the classroom at the same place. The teacher gives some homework, or requests activities to be finished outside the classroom so that student can have grip on the concept or topic they have learned. The purpose of this study is to investigate the effect of reverse learning based on information technology and intelligent information technology in order to improve the education in practical courses of undergraduate students of information technology using the method of teaching. The research method is quasi-experimental. The statistical population consisted of undergraduate students. Students were selected through two classes of control and multi-stage sampling. 62 of the number of students were considered for both reverse learning and explicit (traditional) methods. The research instrument was a pre-test and post-test. After the pre-test, a reverse and traditional teaching method was used for 62 sessions. Then, the post-test was taken from both groups. Data were analyzed using descriptive statistics and inferential statistics (covariance analysis) and estimated and its validity was approved by experts. The reliability of the test was based on Cronbach's Alpha coefficient of %. The findings suggest that reverse teaching is more effective in undergraduate students learning than traditional teaching (explanatory).

Key word: teaching method, learning, master, student, flipped classroom

Introduction

This literature review will examine the research on the flipped learning model. Although flipped learning is not a new concept, in recent years it has gained popularity. Many educators have taken interest in implementing a flipped learning model into their classrooms, so this review will examine the impact that the flipped learning model has on student performance.
Today's world in all respects represents features that have fundamental differences. Therefore, continuing the survival of education systems through traditional education, relying on the material contained in the textbooks, looking at students as a subjective and receptive creature, and mastering the axis of knowledge in today's fast-paced world is not possible. Many researchers in different countries have begun to solve this problem and have introduced new methods for teaching and learning, and they have analyzed these methods, and they all agree that other traditional teaching methods do not meet the needs of the 21st century. Today, society needs innovative and creative educational models to prepare students for coping with life's crises and exploiting their opportunities and creativity. Therefore, students should learn how to learn through scholarly thinking and dealing with issues and problems rather than memorizing. To accomplish such goals, students are actively involved in the teaching of student-involved issues and learn about issues that are relevant to their actual lives, because innovative initiatives that are consistent with life make learning more attractive and learners' willingness and effort to learn. More (2531) In the opinion of Edgar Deale, the amount is reminiscent of the education and its sustainability in the mind appropriate to the engagement of students with the subject of learning. He described this as a pyramid called the Learning Pyramid, a method like a lecture at the top of the pyramid, leading to a 2 percent lifespan of learning. While in lower classes, group discussion of 32%, practice by doing 37%, teaching to others has 47% of lifesaving learning. According to the education experts, students who learn through active learning not only learn better but also enjoy more learning, because they are actively involved in the learning process rather than just listening, and they themselves responsible for learning. Teaching methods in terms of function and benefits in the course of education are not at the same level. Reverse education due to its compatibility with the natural process of life is one of the most important and most efficient methods of teaching and classroom. (Kramaddini, 2623)

In the methods used today in the classroom, it is rarely considered appropriate to the principle of thought and independence, self-reliance, and the use of information and materials learned. These issues are reduced to a great extent in active teaching methods (Jalili, 262)
The reverse learning method makes it possible for the scientist to cultivate the power of thinking in a person through thinking and preaching and using the right time, as well as raising his social and self-esteem. The reverse learning method makes it difficult for the instructor to organize time and time properly. Therefore, the various advantages of this method have led to the study being carried out. The reverse method in Iran is not implemented due to a series of necessary issues and infrastructure and the lack of knowledge of the professors. Therefore, the above mentioned issues highlight the importance of examining the impact of new educational methods so that the issues raised in the future will become clear to the teachers (Bachnak R & Maldonado S, 2612)

According to the definition of this method and the advantages of this method in comparison with the traditional method and considering the fundamental role of methods Learning and learning and the importance of choosing the method according to the conditions and criteria such as the nature of the subject and the characteristics of the age characteristics of the learners as well as considering the concerns and problems that exist in the training. The
The present article examines the new teaching method (reverse learning) and the impact dedicated. In fact, it seeks to measure the impact of the reverse learning method in comparison with the lecture method on learning. Therefore, this research attempts to measure the effect of the reverse learning method on the traditional (explanatory) method.

**Theoretical Foundations**

For years, experts and planners have tried and developed new and modern technology to revolutionize methods and methods to improve teaching methods. So today, new and accessible technologies, as well as educational solutions, have created a new atmosphere for the whole world. In this new space, a large amount of information and learning is something that should be addressed in the educational system, but there are limitations in this way. (Amani, 2014)

New teaching technologies, like all technologies, have changed dramatically over the past 10 years. A collection of this technology makes the recording of the speech, and in fact, the ability to capture what's happening in the classroom. At first, speech recording was used to help students in more difficult academic terms to compensate for the expired classes. (Attar, 2012, p. 22)

Through this model, professors hoped to be assigned as well as in online courses. The time of attendance with students is in dealing with conceptual problems and facilitating class activities rather than lectures. In addition, through pre-class preparation, for accredited students, the skills necessary for lifelong learning are strengthened. Online educational resources are encouraging students to reverse the classroom in terms of popularity and technology prevalence in daily life (Kecskemety, Morin, B, 2014)

**flipped classroom**

Each education is based on three elements: content, communication and curiosity. If a teacher is involved with a curriculum designed and designed with a curious student, the student becomes a learning resource for the content. The curious person is here and there, looking for unknowns. One way to stimulate student curiosity is to change the teacher's role from lecture to learning design. In the teacher's class, he prepares activities that stimulate students' curiosity. We move the content out of class. One of them is to provide a short tutorial video tutorial on the lesson. As a result, it saves time and we are faced with an apprentice who in fact has provided him with various other activities in the classroom. In the inverted class, there is a educational solution for technology education. The teacher must design, reverse the classroom, plan, and review. The success of the reverse classroom requires thought and planning. The best way to succeed in implementing an inverse class pattern is to create a network of teachers whose grades are reversed, have seen courses, attend classes in reverse-class sessions, and have a lot of questions. Therefore, the idea of a reverse class is very simple. Learning is done through video or other educational materials that students use before they come to the classroom. And the teacher in the classroom uses group and individual activities in teaching. A teacher alone will not succeed in creating a reverse learning environment. School, colleagues and families should help him. (Educational Letter of Growth, 2014)

In this approach, sometimes referred to as an inverse classroom, the reversal of activities traditionally performed outside the class occurs with those that are traditionally done in the classroom. The reverse classroom has been widely used in secondary education, especially in the classrooms of two hardware education professors, Jonathan Bergman and Aaron Sames (2014), and as a solution, is relatively new education. (Bethany, 2014)
An inverse classroom is a teaching and learning approach that changes the traditional classroom initially, in other words, activities that are traditionally carried out inside the classroom are now performed outside the classroom, and the picture is traditional. (Switch Bank S & De Nucci T, 2014)

The education experts and global leaders from the Flipped Learning Network (An Association that facilitates educators the support, knowledge and skills to implement Flipped Learning), have introduced Four Pillars of Flipped Learning which are essential to adopt by the teachers for implementing Flipped Learning. These Four Pillars are with the acronym (F.L.I.P) where F=Flexible Learning, L=Learning Cultures, I=Intentional Content and P=Professional Educators: (Sams, et al., 2014)

**background research**

A study entitled "Student-based learning" and the reverse-classroom method were implemented in fall and winter in the second and third bases in two separate schools, and the results from student feedback indicate that the sense of self-esteem and use The new educational technologies have created a great joy in them, and they have more mastery over the course and more ability to solve the problem than the rest of their courses. In this way, students progress at their own pace without worrying about the speed of the rest of the classmates (Sharifi, Karami, 2014, p. 62).

**Active Learning and Student Engagement**

In a flipped classroom the student isn’t just a receiver of information. They are an active part of their learning environment. Because they are no longer passive onlookers, students become active learners by participating in class activities that promote peer interactions, teamwork, and meaningful collaborations (Sajid et al., 2014). Love et al. (2014) reported that 57% of students who responded to a survey, agreed that group work helped them feel more comfortable with asking questions and explaining concepts to others. Because students prepare for class before they come, class time can be used for authentic learning experiences.

Clark (2014) stated that in his flipped Algebra 2 class, that students saw an increase in their classroom participation in comparison to their lectured based classes. Smith (2014) reported that active learning activities provided in a flipped classroom allowed students to apply and analyze information more deeply. Hall and DuFrene (2012) also reported that an active learning environment promoted deeper learning that increased student retention. According to Mok (2014) students were less likely to participate in off-task behavior when they were involved in meaning learning activities.

In a flipped classroom, students become more involved in their learning. They are more willing to come to class, they are engaged in the learning experience, and they are more willing to participate in group discussions (Hall & DuFrene, 2012).

Sahin, Cavlazoglu, and Zeytuncu (2019) found that students thought it was easier to prepare for class using lesson videos rather than reading a textbook. Sherrow, Lang and Corbett (2019) mentioned that students felt more comfortable with asking questions due to the informal setting in the classroom. Sahin, Cavlazoglu, and Zeytuncu (2019) reported that student responses on a survey of students in a college calculus course revealed that they the flipped learning model helped them to be more prepared, learn better, and be more confident about learning calculus.

Clark (2014) stated that in his flipped Algebra 2 class, that students saw an increase in their classroom participation in comparison to their lectured based classes.
Figure 2 below shows the comparison of traditional learning and reverse learning (Morgan J. et al., 2014)

Flipped Model in Asia, Pakistan and its implications:

For Asia very little literature is available to gauge benefits of flipped learning. Here, Flipped Learning is a new concept which is gaining popularity with time. The studies show not only the need of more facilities to be provided for growth of this practice but also to bring the educational standards equivalent to the western world, where students are found more confident, independent and research oriented as compared to their Asian counterparts. (Lateef, 2014)

Flipped learning concept is gaining popularity in the western world but in Asian countries, it has lower impact due to the cultural differences between regions. In Asian Countries, major trend is traditional classroom where teacher is the main source of information and students rely on the teachers and like to learn in groups. Further, in Asian countries, the role of the teacher is considered to be as more respectable where students obey the teachers without thinking independently. In flipped learning, contrary to this, students are required to learn independently while watching videos and studying content at home and participate in class for practical and active learning. Further, the teacher’s role is expected to work with the students in solving their queries and guiding them in their practical work. (Lateef, 2014)

Through various mediums students get hold on the latest developments taking place in the world. The younger generation of most of Asian countries has burst forth the run-of-the-mill learning models. Internet has allowed them access to all new information. Hence, Flipped classroom permits them to set their own pace with this progression. Chances to develop soft skills may add to the popularity of flipped learning among the students in Asian countries. (Lateef, 2014)

The paper analyzed the global growth and development of flipped classroom research productivity in terms of publication output as reflected in SCI/SSCI for the period 2010-2015. Publication types and languages, characteristics of articles outputs, countries, subject categories and journals, and the frequency of keywords were analyzed using bibliometric methods. There are 149 articles in 68 journals listed in 51 SCI/SSCI subject categories. A
sharp growth trend of publication output was observed during 2011-2015. USA played a predominant role in flipped classroom research. Education educational research, chemistry and medical were the top 5 categories and “active learning” and “blended learning” recent major topics of flipped classroom research during the past 10 years. The results could help researchers understand the characteristics of research output and search hot spots of flipped education field. (Lie Yang, 2015)

A new model, the flipped classroom is getting attention of teachers and education providers especially in the schools at primary and above primary levels. In this model, the lecturing is done while the student is at home, through a video lecture, placed on the Learning Management System. The student is required to do the problem solving and application while in the classroom, under the guidance of a teacher. This has been found useful as the lecture is available for viewing many times and its quality is the same across the board in the school. The problem solving is carried out in a cooperative mode in which interaction with the fellow students and the teacher is carried out strictly monitored by the teacher. (Herreid & Schiller, 2015)

Mapping the Curriculum:
While flipping a classroom, educators should identify what they want students “to learn” and “be able to do”. They should categorize clearly the aims and objectives of each lesson plan. Planning fundamental questions they believe that students should be able to answer and which exhibit student knowledge can make lesson planning effective and flipped learning more student friendly. (GUIDE, 2013)

Some of the lesson content may be delivered via video lectures, different website contents or through reading assignments. Real learning occurs when students amalgamate knowledge through various resources and create something new. Students would require demonstrating, discussing and practicing in the real classroom situation with a professional teacher to help them in clarifying concepts.

When students will brainstorm and pay keen attention to new concepts at home and then seek guidance from teachers they would come up with many innovative ideas and classroom will become a true learning place for teachers and students together. This requires a conscious and comprehensive planning by the teacher and maximum planning will reveal that there is now an increased time for face-to-face interaction where students feel more empowered and confident with their teaching-learning process.

Technology:
What technology may be useful for flipping the class should be decided with the help of experts in the field. Learning Management Systems can help to implement the concept. (Schell, 2015)

It is presented by a teacher by presenting a series of lectures in the form of sound and pictures and videos. This approach can be useful for teachers who want to know who controls their students are learning. There is no single pattern for the reverse classroom. The time in the class is spent on the lecture on the film first, in the student groups, then in the classroom, and then in the classroom. Students will watch recorded videos before they go to class to open classroom classes and time to troubleshoot difficult concepts, respond to student questions, engage students in active learning, and connect with daily life. Spend them. Learning is basically done through activities that learners do. The learner learns something he does, not what the teacher does, and he only watches. (Seif, 2015)

The main features of the practical courses of information technology, flexibility in terms of implementation conditions, the active participation of students in learning, Attention to the interests of students in learning is the integration of information and communication
technology with a variety of topics (National Curriculum, 1395). These features are also reflected in the teaching of reverse teaching.

In this research, pseudo-experimental method has been used. The statistical population of this research is all undergraduate students of Shahid Motahari School. Among them, 122 students were selected in two classes by multistage sampling method. Twenty-six students were trained for the reverse learning method and the explanatory (traditional) teaching method. Students' learning was measured through tests (pre-test and post-test). The reliability of the test was evaluated by Cronbach's alpha and was expressed as 0.91%. Data were analyzed using descriptive statistics and inferential statistics. A reverse teaching method was conducted in ten sessions in a practical training classroom that was pre-run at the beginning. Students then observed their films before the beginning of each session and attended the class with their readiness. The class time offered training together, and then the presentation of the conference from their group learning to the entire class and the elimination of ambiguities. After the training, you run a post-test. Data was analyzed by spss.

Research findings

After determining the method of his research and using the appropriate tools, the researcher will provide the data required for the test. He assumed his hypothesis. Now the stage is to use the appropriate statistical techniques that are based on the research method and the type of variables. If compatible, the collected data is categorized and analyzed, and ultimately the hypothesis that has In the research, he has been put into a test plant and clarified his assignment, and eventually he could answer for the hypothesis that The investigation sought. Finally, in this chapter, the data collected to respond to the research hypotheses form Descriptive and inferential. In this section, the descriptive findings of the studied variables are presented by the group (traditional education group and inverse training group) and the test time (pre-test and post-test). It should be noted that the number of subjects in the traditional education group was 62 and the number of students in the reciprocal training group was 62. The mean and standard deviation of the two groups in the dependent variables are presented in Table 1 at two test times:

In this section, one-variable covariance analysis was used to compare the effectiveness of both traditional teaching and reverse learning. Regarding the fact that data is normal and homogeneity of variance is one of the main assumptions of covariance analysis, Kolmogorov Smirnov test (Table 2) was used for normalization before presentation of the results of the analysis.

Table 1: Average and standard deviation of two groups

<table>
<thead>
<tr>
<th></th>
<th>میانگین</th>
<th>میانگین</th>
<th>نویت آزمون</th>
<th>متغیر</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD</td>
<td>SD</td>
<td>پیش آزمون</td>
<td>پیش آزمون</td>
</tr>
<tr>
<td>گروه آموزش سنتی</td>
<td>(\frac{7}{21})</td>
<td>(\frac{7}{21})</td>
<td>11/46</td>
<td>پیش آزمون</td>
</tr>
<tr>
<td>گروه آموزش معکوس</td>
<td>(\frac{13}{7})</td>
<td>(\frac{13}{7})</td>
<td>11/46</td>
<td>پیش آزمون</td>
</tr>
</tbody>
</table>

Table 2: Kolmogorov-Smirnov test to examine the normal distribution of learning scores
The results of the table above show that the assumption is that data is normal. Also, the Loon test for the assumption of equality Variable error variance (Table 5) was used.

Table 5: Results of the Loon test for the analysis of the variance of the groups

<table>
<thead>
<tr>
<th>نتیجه</th>
<th>معنی‌داری</th>
<th>K-S آماره Z آزمون</th>
<th>تعداد</th>
<th>متغیر</th>
</tr>
</thead>
<tbody>
<tr>
<td>نرمال</td>
<td>0.133</td>
<td>164/186</td>
<td>52</td>
<td>پیش آزمون بادکنکی</td>
</tr>
<tr>
<td>نرمال</td>
<td>0.827</td>
<td>53/52</td>
<td>52</td>
<td>پس آزمون بادکنکی</td>
</tr>
</tbody>
</table>

According to Table 5 of the Lunn Test, the assumption of the equality of the variances of the groups is shown, since the observed ratio of F is not significant. Therefore, homogeneity of variance was established and the use of covariance analysis is valid.

Table 4: Results of covariance analysis. Comparison of the effects of both traditional and reverse teaching methods in the post-test phase.

<table>
<thead>
<tr>
<th>متغیر</th>
<th>سطح معناداری</th>
<th>درجه آزادی مخرج</th>
<th>درجه آزادی صورت</th>
<th>F</th>
<th>نسبت</th>
<th>متغیر</th>
</tr>
</thead>
<tbody>
<tr>
<td>بادکنکی</td>
<td>0.124</td>
<td>51</td>
<td>1</td>
<td>2/22</td>
<td>2/22</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 4, the effect of the intervention agent, on learning $F(124, 22/22, P<0.001)$

It is statistically significant, with reverse-learning education having a more meaningful effect. Therefore, the hypothesis that reverse learning has an impact on learning is confirmed.

**Discussion and Conclusion**

According to the findings of the present study, the reverse classroom can have great achievements in learning. By analyzing covariance, it was found that the reverse learning method had better results than the traditional classroom. It should be acknowledged that in the field of reverse teaching, few studies have been carried out within the country, indicating that research is unique, but in terms of learning and academic achievement as well as the impact of a variety of active and combination methods. Participation in research is very visible. Spencer et al. (2011) recommend that a reverse classroom be used by coaches who are
interested in promoting their own experiences, such as empirical questions, generated content (educational films), and the discovery of new ideas, student content and choices. They can be a good option (CADQ Guide, 2011).

In other words, this approach can be useful for teachers who want to know how much students control and master their learning. An in-class reciprocal classroom gives students the opportunity to curtail students’ concerns by strolling around the classroom and listening to student feedback. This method not only requires the professor to prepare for the lecture, but also must take into account the out-of-class time structures for studying the students. Another challenge is the resistance of some students. Even with evidence of the effectiveness of this method, students resist what they perceive as additional work. The best strategy I have found to deal with this problem is to expand and explain this issue to students, and that notification to the class on the first day of the semester is about the inverse class structure. Since the training requires more time and ability, and on the other hand, it requires less proficient and skilled teachers, it is less used in the learning process. However, although this model appears to be difficult and time consuming, it has been carefully designed and planned to become easy, enjoyable and effective. This method requires more research at higher levels and in courses. It also needs to measure students' perceptions and impressions about this method.

References


Jalili, Mahsa and Nik Farshm, Hossein "Study of the impact of project-based and research-based learning on learning skills -Process of Students" 21st Iranian Physical Education Conference and 7rd Physics Conference, September 1394.


Cramaddini, Mohammad "Project Based Learning" Elementary Education Magazine, Year 8, Issue 7, 2004.


Amani Tehrani, Mahmoud, (1394), an inverse class of self-learning. The fifth and ninth editions of our fifth and ninth editions.

Bethany, B. (2011) "Flip your class room to Increase Active Learning and Student Engagement", Th Annual Conference on Distance Teaching & Learning.

Learned", 11th ASEE Annual Conference& Exposition, Indianapolis.

CADQ Guide: The flipped classroom, Available at: www.ntu.ac.uk/cadq.


