

Impact of using the flipped instruction strategy on the academic achievement for basic education students & their attitudes towards the courses

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Abstract

The present study aims to identify the impact of using the flipped instruction strategy on the academic achievement of sixth grade students in the course of Information Technology, and their attitude towards the course. The current study followed the semi-experimental approach, and consisted of 66 students who had been randomly chosen from one of the public schools, so that a division of the sixth grade was adopted as a control group, and another division was adopted as an experimental group, and two tools were used for the study, namely, the achievement test and the attitudes test so as to be sure of their validity and reliability.

Results showed statistically significant differences at ($0.05=\alpha$) in the students' achievement in the Information Technology course. Results also indicated that the attitudes of the students towards the IT course were highly significant, but there are no differences in the students' attitudes towards the course that can be attributed to the used teaching method.

Keywords: flipped education, flipped instruction, flipped classroom.

Introduction

As a result of the successive technological developments that have greatly affected all aspects of life, especially educational practices, traditional teaching methods are no longer feasible because they make the learner passive, the thing that made specialists in the educational field search for new strategies and methods where technology is employed in the educational process. Flipped instruction could be one of these strategies that have recently emerged.

Flipped instruction guarantees that the teacher spends more time in discussion instead of lecturing and students can interact with the teacher instead of being passive recipients, as students watch the lectures at home and spend most of the class time in discussions with other students and teachers. (Abanami, 2005)

Flipped instruction emerged in 2006 at the hands of Bergmann and Sams, two teachers in one of the American rural states, but it was not then known as flipped classrooms, and it was designed to explain lessons to students who were absent from school by recording lessons and uploading them to YouTube website so students can watch them later.

Bergmann and Sams (2012) noted that the idea of flipped instruction is that what happens at school is done at home, and what is done at home takes place at school, and that time in the flipped classroom will be reorganized so that students may discuss the video they have

watched before at the beginning of class and get answers to their questions, while the rest of the class time is used for carrying out activities.

Therefore, we can say that the flipped instruction strategy is a strategy in which the teacher prepares videos and audio files that explain the lesson for students to watch and listen to before class, while class time is set for exercises and discussions. Thus, flipped classroom helped significantly in raising academic achievement, as confirmed by many studies.

Taking into account that flipped instruction is a form of language that the digital generation excels, this research was conducted to identify the impact of using the flipped instruction strategy on raising the academic achievement of sixth grade students in IT course, and the students' attitudes towards it.

Problem Statement

Through follow-up a number of public schools in the Governorate of Muscat, the researcher noticed the weakness of the students' skills in creating Mathematical tables and dealing with Mathematical Functions, and by following them up during their classes, it was notable that their achievement level in this aspect was low. After interviewing students, they attributed this to class time, their inability to absorb the course, and the lack of time for discussion and asking questions, as there are only two classes a week for the course.

So it was notable for the researcher that there is a need to conduct a research study that would contribute to raising the achievement level of the students in the spreadsheet program. It was also notable that the scientific content was large, and the number of sessions (two sessions a week) makes teachers unable to give students enough time of follow-up, and also made students have a negative attitude towards the course.

Therefore, there was an urgent need to develop the educational process by using the modern concepts in instructional technology. So a strategy that would help the teacher raise the academic achievement of their students, overcome the problem of the session time, limit the students' negative attitude towards the course, and also makes him keep up with technology has been suggested. The researcher also suggests using the flipped instruction strategy because it's one of the best strategies that make the teachers use class time in enriching students with discussions and activities, because the student watches the lesson as a video before the class, and, therefore, would be more interactive during lessons, and it also takes into account the individual differences between learners and makes learning more enjoyable.

Study Questions:

The present study tries to answer the following main question:

What is the impact of using the Flipped Instruction strategy on the academic achievement on sixth grade students in the Information Technology course and their attitudes towards it?

Study Hypothesis

1. There are statistically significant differences in the sixth grade students' achievement in the IT course at 0.05 after the post implementation of the achievement test in favor of the experimental group.
2. There are statistically significant differences in the mean scores of the two groups between the post and pre attitude measurement test towards the IT course.

3. There are statistically significant differences in the achievement of the sixth-grade students in the IT course at 0.05 after the post implementation of the measurement of attitude towards the course in favor of the experimental group.

Study Variables

Independent Variable: teaching method (Flipped Instruction strategy, the usual way)

Dependent Variables:

- The achievement level of the students.
- The students' attitudes towards the IT course.

Study Objectives

The present study aims to:

1. Identify the effectiveness of flipped instruction in raising the academic achievement of sixth grade students in the IT course
2. Identify the students' attitudes towards the IT course
3. Identify the impact of using the flipped instruction strategy on the students' attitudes towards the IT course

Study Significance

The significance of the present study is as follows:

Theoretical Significance: the present study represents one of the tendencies towards achieving the skills of the 21st century through employing the technological innovations in education, and making it more effective and efficient. The study also presents a theoretical study about using the flipped instruction strategy in raising the academic achievement in the IT course and changing the attitudes of the students towards the course through putting forward the strategic concept, and the preparation and implementation steps of the strategy, in addition to its advantages and the most important programs used to implement it.

Practical Significance: In practice, the present research is helpful to: those who are interested in developing education and educational practices, such as postgraduate students, teachers, and educational supervisors. It helps students change their attitudes towards courses by flipping instruction. It also helps educational researchers who are specialized in instructional technology to identify the efficiency of the flipped instruction strategy.

Conventional and Procedural Definitions:

(a) Flipped Instruction

Conventional Definition: it means flipping teaching tasks between class and home, where the teacher prepares the educational material in a video that the student watches at home, and carries out the activities in the classroom, the thing that increases his understanding of the course. (Hamza, 2015)

Procedural Definition: researcher procedurally defines it as the process of flipping instruction by sending videos that explain the IT curriculum via the Internet or by giving them to students on CDs to watch at home and write down their questions, and then attend the class to discuss them and carry out required activities.

(b) Academic Achievement

Conventional Definition: Galali (2011) defined it as “the total skills and knowledge acquired in an organized scientific way, indicating the extent to which students absorbed what they have learned in a course, and it’s measured by the degree that a student receives in the exams”.

Procedural Definition: researcher procedurally defines it in the present research as the knowledge, skills, and understanding that students acquire after teaching them the topics of mathematical tables in the IT course.

(c) Attitude

Conventional Definition: Othman (2016) defines the Attitude as the tendency of an individual towards any of the standards or values that are common in social environments.

Procedural Definition: researcher procedurally defines it as the students’ views about the IT course after using the flipped instruction strategy in teaching it.

Study Limits

Space Limits: public schools - basic education

Time Limits: first semester 2015/2016

Human Limits: sixth grade students at one of Muscat Governorate public schools.

Theoretical Framework

Flipped Instruction

The knowledge boom shaped by technological developments has had an effect on all fields and aspects of life. Consequently, educational institutions have benefited from the use of technological innovations in the educational process and the introduction of modern methods of education.

Zahrani (2015) notes that the emergence of flipped instruction was a result of two main factors. The first factor is the technological evolution that significantly contributed to knowledge transfer, and the other one is the instruction methods and strategies that attempt to transfer information and benefit from it.

Al-Zaher (2016) states that flipped instruction is based on flipping the educational process in order to overcome the problems of traditional teaching on one hand, and employ technology in educational approaches and methods on the other.

The Concept of Flipped Instruction

Bergmann and Sams (2012) emphasize that flipped instruction as a practice is not new, as teachers had been used to ask their students to prepare lessons before class time for years, but the flipped instruction strategy is a modern strategy, because it created a new dimension to employ technology in the used educational methods.

Metwally (2015) said that flipped instruction occurs when the traditional classes are turned into lessons that are made available on the Internet, where the lecture is in the form of a video, a presentation, or an audio track before class time.

The researcher emphasizes that flipped instruction occurs when the processes that take place inside the traditional class take place outside it, and the processes that traditionally occur outside it occur inside it. In traditional education, the teacher gives the concepts during class time, and the student does homework by himself at home, the thing that would cause

negative attitudes among students. But in flipped instruction the student watches the video at home and attends class for discussion and activities, and this has a positive effect on his understanding and attitude towards the course. In this regard, there were numerous different definitions of flipped instruction. For example, Zaharni (2015, page 8) defines it as “the strategy that benefits from using educational videos to make the processes that traditionally occur inside the classroom occur outside it and, on the other hand, allow the processes that traditionally take place outside the classroom take place inside it”.

McLean, Attardi, Faden and Goldszmidt (2016) define the flipped instruction strategy as the approach that aims to repurpose class time to focus on application and discussion; the acquisition of basic concepts and principles is done on the students' own time before class.

Consequently, flipped instruction depends heavily on the videos that explain the content, and the student uses them before class, whether they're produced by the teacher or found on the Internet.

The Significance of Flipped Instruction

Flipped instruction is one of the new practices used in developing educational methods. The significance of flipped instruction is that it created a new dimension that allows students to learn according to their own different paces. In Traditional instruction, the teacher used to explain the lesson during class time, and students do activities and deepen their learning at home through homework. But in flipped instruction, the teacher explains the lesson in a video that is made available for students before class time, so students can watch it more than once till they understand and absorb it according to their different abilities. (Al-Sayed, 2014).

Metwaly (2015) noted that students in flipped instruction attend class while they are fully prepared to interact with the teacher and solve activities instead of only listening to the explanation. So we here emphasize the importance of preparing the educational material in a way that raises the motivation of the students and encourage them to learn from the videos that they watch before class.

Bergmann and Sams (2012) say that flipped instruction optimizes the utilization of class time, so the teacher can determine the level of understanding of his students at the beginning of class and focus during the rest of time on clarifying the things that students didn't understand, supervising activities that students do, and helping students who need help, which raises the cognitive acquisition of students, because flipped instruction takes into account the differences between students.

DeRuisseau (2016), Bergmann and Sams (2012) note that the importance of the tendency to use flipped instruction is the result of two things, first, it takes into account the differences between students, as students can watch the videos according to their own paces through pausing the video and replaying it more than once and in the time that suits the student without being limited to a specific time.

Flipped Instruction Advantages:

The most eminent advantage of flipped instruction is that it's not limited to a specific curriculum or educational level, or to specific categories of students or teachers. (Bergmann and Sams, 2012).

The advantages of flipped instruction generally appear in its significant consistence with the current are, as students tend to use technology, and consequently, the teacher deals with

digital creatures. Abdullah emphasized the importance of adopting this modern strategy, as flipped instruction allows the teacher enough opportunity to listen to students and discuss their extent of understanding and the extent to which they achieve the desired goals. Thus, it makes students highly interactive.

In addition to these advantages, flipped instruction plays a significant role in the development of education in general, and in students' grades through motivating them towards individual learning and supporting educational activities that focus on the student, as confirmed by researches and studies, as the current modern studies focus on the importance of making learning centered around the learner in order to achieve more pros. Abdul-Ghany (2015).

Since most of educational activities are not carried out during class time, flipped instruction offers excellent opportunities to students to practice highly-efficient educational activities by using digital technology, and consequently, it doesn't focus on using videos, but on how to make the best use of class time, and equally serves both students with educational difficulties and talented students by giving them the chance to discuss and ask questions during class time. (Bergmann & Sams, 2012).

Al-Zaher (2016) also stated that flipped instruction helps teachers to manage class efficiently and overcomes the problem of absence and lack of numbers of teachers, as it allows recording lectures and giving them to students who should watch and study them.

Pillars of Flipped Instruction

To apply flipped instruction there must be a number of key pillars that make teaching more efficient and effective. The pillar is providing flexible learning environment; as any rigid environment makes applying flipped instruction more difficult, as the teacher in this kind of education always needs to reorganize the educational situation in accordance with the needs of students and their educational levels. (Metwaly, 2015).

The concept of learning also must be changed so as the student be the focus and basis of the educational process, thus abandoning the traditional education perspective that considers the teacher the source and center of knowledge, as the student in flipped instruction is the axis of the educational process. The teacher's role in flipped instruction is to help the learner move from one cognitive level to another, in addition to guidance and counseling. (Al-Hanan, 2016).

In addition, the analysis and division of educational content should be carefully thought out in order to define what will be directly presented to the student inside the class, and what will be presented to him through flipped instruction. This depends on the nature of the course that students study, and on the nature of students themselves, and according to the decisions they make in this regard. (Metwaly, 2015).

For this kind of education there is an urgent need to provide highly-efficient trained teachers, contrary to what many people think, as the need for the teacher increases in flipped instruction to deal with this pattern, and make decisions about moving between direct and indirect instruction. The teacher should possess the skill and ability to produce high-quality educational materials.

Teacher's Role in Flipped Instruction.

Al-Deriby (2016) said that the role of the teacher in this strategy is a motivator, helper, and guide. He provides support to students who need it and supervises the regularity of

activities. The teacher enjoys spending time in interacting with students inside the classroom instead of delivering a lecture. This gives the teacher enough time to indulge in effective educational activities with students.

Al-Zaher (2016) and Bergmann & Sams (2012) emphasize that the role of the teacher in this strategy can be summarized as follows:

1. Define lesson objectives and products, in addition to age range.
2. Bring the educational material produced in the form of a presentation or a video to allow students to learn lessons.
3. check the filmed material
4. Present the educational material to the student sequentially and systematically as in classroom.
5. Share the electronic material with students and telling them to watch it before attending class.
6. provide feedback
7. Supervise the evaluation system of students.

Student's Role in Flipped Instruction

Bergmann & Sams (2012) and Abdullah (2015) noted that the role of the student in flipped instruction can be summarized as follows:

1. Observes his colleagues
2. Provides feedback to his colleagues
3. Evaluates his own and his colleagues learning
4. Responsible for his own learning in the educational environment centered around him
5. Positive and active participation in producing knowledge and forming cognitive structure by himself.

In addition, Abdul-Zaher (2016) thinks that one of the important roles that the student plays in flipped instruction is to search for available and numerous sources such as the Internet and collect information, and role-playing.

Conditions of Flipped Instruction Application

For the success of the flipped instruction strategy, the following conditions should be necessarily taken into account:

- o Perform the activities that were considered homework in the classroom.
- o Perform the activities that were considered classroom activities outside the classroom.
- o It's necessary that these activities take into account the interaction of students during learning, methods of problem solving, learning from peers.
- o It's necessary to perform the educational activities that proceed the class time; i.e. watching videos.
- o It's necessary to employ technology, especially using educational videos.

Flipped Instruction Video Production Steps:

Producing flipped instruction videos should be accurate and through a carefully planned process, in order to make the maximum use of the film material to serve the goals set in advance by the teacher. Deriby (2016) mentioned a number of points that should be taken into account when producing the film material. These points are identifying educational goals that that teacher seeks to achieve, then recording the video that takes many forms, some of which are as simple as recording the teacher's explanation, and some are

professional videos that are produced by using programs and modern technology techniques. Then comes the video editing to remove any unwanted parts, and the video is uploaded to websites such as YouTube and upload sites, or given to students on CDs.

When using the Internet to publish a video, we should take into account the educational video size, as its size should be reduced so students can watch and download it easily. The validity of Internet servers on which the videos will be uploaded should also be checked. If the videos will be distributed in CDs, size would be less important. (Hassan, 2015).

Stages of Flipped Instruction Implementation:

Deriby (2016) and DeRuisseau (2016) noted that the implementation of Flipped Instruction starts with defining the lesson which the teacher will use the flipped instruction strategy to explain, and making sure of its validity to that. Then the teacher analyzes the content to values, knowledge, and skills, and to concepts that are important to learn. Then the educational or interactive video is produced and designed, and it preferably should not be long. Then the students are directed to watch the video, or the educational material is given to them on CDs. Students, after that, apply the concepts that they learned from the video in the classroom through activities and projects that the teacher ask them to carry out. The teacher also performs his role in the educational process by using the appropriate tools.

Flipped Instruction Tools

Al-Hanan (2016) referred to a set of tools used in flipped instruction, including:

1. Knowmia

A learning platform that offers a set of videos created by teachers all over the world. A teacher can create short educational videos to share with his students.

2. Explain Everything

It is an easy-to-use tool for dynamic interactive lessons and designing presentations, as well as the creation and evaluation of tests. It also includes explanation and clarification of everything related to the lesson.

3. Edmodo

It is a website that allows teachers to create virtual classes and allows students to chat with the teacher or with each other. Teachers can also send announcements to all students, show slideshows, exchange documents, and create and evaluate tests.

Comparison between traditional instruction and flipped instruction:

If we want to make a quick comparison between traditional instruction and flipped instruction strategy, we find that in traditional instruction the teacher will explain the lesson to the student directly in the classroom, and then ask him to answer questions or carry out activities at home, while in flipped instruction the teacher gives the student the scientific material so that the student shall listen to and watch at home by using audio and visual technology, and then implement what he learned at home in the classroom with the teacher, the teacher's role in flipped instruction turns from being a teacher into being an assistant, motivating and supervising for students, so the teacher can spend more time interacting with his students rather than lecturing. (Johnson, 2012)

Difficulties of Applying Flipped Instruction:

The process of applying flipped instruction faces a number of difficulties, the first of which is the availability of technology for the application of flipped instruction, as do all technology-

based strategies and methods. The more appropriate technology is available, the more it helps to create a suitable environment for the application of this type of teaching.

Metwally (2015) also suggests that the application of flipped instruction may create a gap between high-income families and low-income families. Wealthy families can provide modern equipment for their children with greater access to the Internet.

Among the difficulties faced by this type of education are the teachers' mentality and the difficulty of changing their teaching methodology, especially as this method makes the student the focus of the educational process and its basis. The teacher is only one source of various sources of knowledge that the student can refer to. (Snowden, 2012)

In addition, there is a need for flipped instruction that the teacher has the necessary skills to produce the film materials required by this type of teaching. This requires more effort by the teacher, in addition to sufficient training by the educational institution so that the teacher can produce film material that performs the desired goal with high efficiency.

On the other hand, Al-Zain (2015) stated that the student must be able to assume his responsibilities in the educational process. It is necessary to move away from the traditional view of learning, which is based primarily on what the teacher says in the classroom. This requires the teacher to be enthusiastic to explain the advantages of moving to this education, with a constant willingness to answer students' questions and inquiries regarding this method of teaching.

In addition, there is a lack of appeal in lectures that rely only on video, some studies have shown that some students who have learned through the flipped instruction method see that video lectures are less attractive to them, and make them in less self-regulation than living classes; because the learner is only a listener and cannot interact directly with them. (Abdullah, 2015)

According to Zahrani (2015), the use of the flipped instruction method may consume more time and effort than usual in traditional teaching, and there are obstacles when using this method to teach more specialized educational materials, in addition, some students do not absorb education through technological means.

Previous Studies

Al-Hanan (2016) aimed to identify the effect of the flipped instruction strategy on the development of the skills of the archaeological awareness and self-organized learning skills in history. The results indicated an effect of the use of the flipped instruction strategy on self-organized learning skills and archaeological awareness.

The study of DeRuisseau (2016) aimed to understand the effect of flipped instruction on critical thinking on a sample of 50 to 80 students in the faculty of Liberal Arts. The results found that thinking skills are higher and students' performance is better in flipped instruction versus the traditional model.

Abdul-Zaher's study (2016) aimed to measure the effectiveness of a program based on flipped learning to develop the achievement and survival of the effect of learning and direction towards flipped learning. The results proved the effectiveness of the program based on flipped learning through the development of the cognitive achievement of the students of the Mathematics Department at the Faculty of Education in the new valley, as well as the existence of an impact on student's learning.

The study of Abanmi (2016) aims to identify the effect of the use of the flipped instruction strategy in teaching the Quran Interpretation course on the academic achievement and the attitude of the students second year of secondary school towards the course. The results of this study showed a significant positive effect of teaching the Interpretation course using the flipped instruction strategy to develop academic achievement, and improve students' attitudes towards the course.

The results of study of Zein (2015), which aimed to find out the effect of flipped instruction on academic achievement, showed that there was positive effect after using the flipped instruction strategy on the academic achievement of students at the College of Education at Princess Noura Bint Abdulrahman University.

Deriby's study (2015) aimed to identify attitudes and perceptions about the application of flipped instruction in education and its results confirmed that there are positive attitudes towards the use of strategy in teaching.

Zahrani's study aimed to identify the effectiveness of the flipped instruction strategy in developing the achievement level of students in e-learning curriculums according to Bloom's Cognitive Taxonomy. The results indicated that there is no effect on the lower cognitive levels and the existence of an impact on the higher cognitive levels.

Abdullah's study (2015) also aimed to find out the effectiveness of a suggested program to overcome the writing difficulties facing non-Arabic-speaking beginners using the virtual flipped classroom based on electronic games. The program contained many exercises, learning resources and innovative educational games. The results of the study showed the effectiveness of the program in the development of writing skills.

For its part, Metwally's study (2015) aimed at clarifying the mechanism of employing the strategy of Flipped Classroom in the processes of teaching and learning by clarifying the of concept of Flipped education, its foundations, its advantages, the difficulties facing its application, and the basic steps to implement it.

Hassan's study (2015) aimed at measuring the effectiveness of flipped learning based on visual blogging for the development Umm Al Qura University teaching staff's skills of designing of electronic tests. The results proved the effectiveness of using flipped learning based on visual blogging in the development of the cognitive aspect and skill performance for the design of electronic tests.

Davis & Others study (2013) aimed to study the effectiveness of flipped learning in the course of technology for pre-university students at Brigham Young University. the study concluded that the use of flipped learning technology was effective, and increased student motivation to learn and facilitated the learning process.

Johnson's study (2012) aimed to know the impact of the flipped classes on the course of computer applications and its results proved the positive impact of the flipped classroom through asking class questions and the development of positive attitudes of students and teachers in secondary school.

Snowden's study (2012) aimed to reveal the perceptions of teachers towards the flipped classes. The results showed a positive attitude towards flipped instruction in teaching basic courses teachers (mathematics, English, social studies, science) in one high school in Texas.

Commenting on Previous Studies

Through following up previous studies, the importance of applying the flipped instruction strategy, and its impact on learners in different stages of education became clear to the researcher. Studies, in their entirety, indicate the efficiency of this strategy, and that it increases the learners' level of achievement and the rate of their interaction with the courses in which this method was applied, and that the implementation of this strategy helped to take into account the individual differences between learners, and the individualization of education.

On the other hand, the implementation of the flipped instruction strategy had positive results for teachers. It contributed to the development of their performance, guaranteed the quality of the educational process, and provided them with time to supervise their students.

Some previous studies also shown that the strategy of flipped instruction is in line with the requirements of digital development in the world, and the need for teaching methods that keep pace with modern technology. This strategy was characterized by flexibility with learners, achieved effectiveness with students who faced academic difficulties and greater interaction between the teacher and learners; thereby it outperforms the traditional methods of education in which the learner is merely a recipient of the information.

Research Approach and Experimental Design

The researcher used the semi-experimental approach to verify the purposes on which the study was based.

Table (1)
Research Experimental Design

| Groups | Pre tests | Experimenta I treatment | Post-tests |
|--------------|---|----------------------------|---|
| Experimental | Achievement test | flipped instruction | Achievement test |
| control | Defining attitude towards the course | Traditional method | Defining attitude towards the course |

Study Community and Sample

One of basic education public schools in the Governorate of Muscat had been chosen to carry out the study through cooperation with the school administration. Two sections of the sixth grade people had been selected to conduct the study. The sections were randomly selected and one was appointed an experimental and the other was a control group. The study sample consisted of 66 students, 33 students per group.

Tools of the Study

First: Achievement Test

In order to achieve the objectives of the study, the researcher identified the unit of spreadsheets program in sixth grade Information Technology book, which the study has been conducted through the implementation of the strategy in teaching it. The achievement test was prepared to measure the level of students in the selected unit, and within the objectives of the unit and the content. The test, in its initial form, consisted of (10) paragraphs, taking into account that it contains all the lessons of the unit through which the strategy was to be

implemented. The students were given sufficient time to answer its questions, and its validity and reliability were verified as follows:

Test Validity

The validity of the test was confirmed by a group of 12 arbitrators of IT supervisors and teachers to make sure that it's suitable for the unit of spreadsheets for the sixth grade. Based on the views of the arbitration committee, four paragraphs of the achievement test were modified until the test became very credible and was highly appropriate for the purposes of the current research.

Test Reliability

The test was conducted on an exploratory sample that represented the sixth grade students in the same school in order to ensure that the test was reliable, the test was applied, then after two weeks the application was re-applied and the reliability coefficient was measured by Pearson's coefficient which reached (0.70). This value is acceptable and appropriate for the purposes of the present research.

Table (2)

Table of Arithmetic means and standard deviations for the measurement of students' achievement in the pre-test of the sixth grade in IT according to the research groups.

| Group | Number | Arithmetic average | standard deviation | T value | Statistical significance |
|--------------|--------|--------------------|--------------------|---------|--------------------------|
| Experimental | 33 | 8.33 | 1.64 | 0.59 | 0.554 |
| Control | 33 | 8.09 | 2.41 | | |

Table (2)

Table (2) shows that the arithmetic average of the group studied using the flipped instruction strategy was (8.33) with a standard deviation of (1.64). The arithmetic average of the group studied in the normal way was (8.09) with a standard deviation of (2.41), noting that although there were apparent differences, there were no differences when calculating the value of (T), as the value of (T) was (3.39) with a significance of (0.59), which indicates the significant parity of the two study groups.

Second: Questionnaire

After the researcher's readings through the previous literature and using the views of specialists in the technology of education and evaluation specialists, a questionnaire was created to measure the attitudes of the students of the two groups towards the Information Technology course. The paragraphs of the questionnaire which consisted of (20) words in their initial form and the response were designed according to a five-degree scale that gives weights of the alternatives as follows (Strongly agree 5 degrees , agree 4 degrees , neutral 3 degrees, don't agree 2 degrees, and strongly don't agree 1 degree) .

Questionnaire Validity

To verify the validity of the tool, it was presented to a group of 12 arbitrators of technology education and IT curriculum and Arabic language specialists. Three paragraphs were deleted and five paragraphs were amended based on the views of the arbitration committee. The number of paragraphs after the arbitrators' opinions was 17.

Questionnaire Reliability

To confirm the stability of the questionnaire, it was presented to the same exploratory sample on which the achievement test stability was tested. The Questionnaire was reconducted after two weeks of the first application. Pearson Correlation value reached (0.7) between both times, which indicates that the questionnaire was consistently reliable for conducting the study.

Study procedures

The researcher made the videos available on a special channel on YouTube, arranged the clips within the channel according to the educational content of the target unit, and gave the channel link to the experimental group's students, with a brief guide to the names and links of educational clips to watch at home and to review their contents before classes.

The researcher also prepared a list of topics that would be discussed with the students after watching the videos at home and a list of the exercises and activities that will be carried out in the classroom. The researcher told to the students they need to write a comment on the same link of the video, in order to confirm that they have viewed its content.

As for the control group, the same teaching methods used in schools have been implemented, which take the traditional form in introduction and explanation. The teacher was told to make sure that the explanation includes all of the information. Only the teaching method is different.

Study Results and their Discussion

In order to confirm the validity of the first hypothesis, "There are statistically significant differences in the achievement of the sixth grade students in the Information Technology course at the level of (0.05= α) after the post-application of the achievement test in favor of the experimental group", The arithmetic averages and standard deviations of the students' grades were calculated in the pre and post-test, and then the T-test degree was calculated to determine the difference between the scores of the two groups. This is illustrated in Table (3).

Table (3)

Arithmetic averages and standard deviations of the grades of students in the pre and post-test and the significance of the T test.

| Group | Arithmetic Average | Standard Deviation | T value | Statistical Significance |
|--------------|--------------------|--------------------|---------|--------------------------|
| Experimental | 5.59 | 1.86 | 3.39 | 0.001 |
| Control | 7.25 | 2.11 | | |

The table shows that the arithmetic average of the group studied by the flipped instruction strategy was (7.25) and the standard deviation was (2.11). The average of the group studied by the traditional way was (5.59) with a standard deviation of (1.86). T value was (3.39) with Statistical significance of (0.001) and through the previous results it became clear to the researcher that there are statistically significant differences due to the used teaching method (flipped instruction method), and therefore the researcher accepts the first hypothesis.

In order to confirm the validity of the second hypothesis, which states that "there are statistically significant differences between the mean scores of the two groups between pre and post-test of the measurement of attitude towards information technology course", the arithmetic averages and the standard deviations of the study sample were calculated (the group which studied with the usual way and the group with the traditional way). The results showed that the averages of the control group reached 3.75 and the standard deviations were 0.498. The results showed that the averages of the experimental group reached (3.97) and the standard deviations were (0.454). It became clear to the researcher that the attitudes of the control and experimental group towards IT course are positive attitudes. Therefore, the researcher accepts the validity of the second hypothesis.

In order to assure the validity of the third hypothesis, which states that "there are statistically significant differences in the achievement of the students of the sixth grade in the Information Technology course at the level of (0.05 = α) after the post-application of the measurement of attitude towards the course in favor of the experimental group", the T test of the arithmetic average and standard deviations of the students' responses in the attitude measurement towards the IT course was calculated due to the followed teaching method. The results were as shown in Table (4).

Table (4)

The arithmetic averages and standard deviations of the students' scores in the attitude measurement test after the implementation of the strategy and the significance of the T test.

| Group | Arithmetic Average | Standard Deviation | T value | Statistical Significance |
|--------------|--------------------|--------------------|---------|--------------------------|
| Experimental | 3.75 | 0.49 | 0.111 | 0.111 |
| Control | 3.97 | 0.45 | | |

The arithmetic averages of the group studied using the traditional method were 3.75 with the standard deviations (0.498). The averages of the group studied using the flipped instruction strategy were 3.97 with the standard deviations 0.454. Through the above results, the researcher finds that there are no statistically significant differences in the attitudes of students towards the course due to the followed teaching method, as the statistical significance reached 0.111.

Discussion of Research Results

The results of the present study indicate the effectiveness of employing the flipped instruction strategy in the development of the cognitive achievement of the sixth grade students. The results indicated that there is an impact of using the strategy after applying the post-test. The researcher attributed this to the following reasons:

- Using the educational strategy (flipped instruction) helped to make learning student-centered, so the student has got to learn effectively.
- Students' use of video streaming technology makes the learning process exciting for them because it is a popular way for the digital generation students.
- Watching the video before attending the lesson increased the motivation of students towards learning and helped to keep the impact of learning and repeating the video more than once.
- Giving students the opportunity to discuss and practice skills helps them to raise their knowledge and skills.

The results of the current study match the results of Gross et al (2015) which revealed the impact of the strategy on the cognitive achievement and effectiveness of students, and agreed with the study of Abdel-Zaher (2016) which revealed its impact on the cognitive achievement in Mathematics, and the study of Abanami (2016) which revealed the impact of the strategy on the academic achievement of students of the Faculty of Education. It also agreed with Al- Zahrani study (2015) which revealed the impact of the strategy on the academic achievement in Science, and with the study of Gross 2015 which showed the impact of the strategy in raising achievement and effectiveness. However, it disagreed with the study of Osman (2016) which results showed no impact of using the strategy in the development of academic achievement in Science.

On the other hand, the researcher emphasizes that the results revealed the lack of an impact of the use of the flipped instruction strategy on the attitudes of students towards the IT course, and researchers attributed this to the following:

- The time during which the strategy was used was not enough to have an impact on student learning, and the strategy was implemented in just one week and did not have any effect on changing students' attitudes toward the course.
- The attitudes of the students in the pre-scale of the tool was of great extent and in the post-scale was with the same degree indicating that the change wasn't noticed because their attitudes were positive since the beginning.

The current study disagreed with the results of most of the studies that have studied the impact of the strategy on changing the students' attitudes towards the course such as the study of Osman (2016) that revealed that there's an impact of the strategy on the attitudes of students towards science, and the study of Abanami (2016) which revealed the impact of the strategy on the attitudes of students towards the course of Quran Interpretation, and Johnson's (2012) study which stated that the strategy influenced the attitudes of students towards the course, and attributed this to the reasons mentioned above.

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