

# The Effect of using the Flipped Learning Strategy on the Achievement of Physiology Students at the Medical Technical Institute

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## ABSTRACT

The current research seeks to identify the effect of using the flipped learning strategy on the achievement of physiology students at the Medical Technical Institute. To achieve the objectives of the current research, the researcher followed the steps of the descriptive approach, where the research determined the research design with a partial pattern with two groups, the first experimental (following the inverted teaching method) and the other subject to observation to teach physiology in the traditional way. The researcher chose a sample of (60) students from the Medical Technical Institute in Baghdad receiving physiology, and to ensure the quality of the experiment, the researcher made a number of equations between the two groups in age and intelligence, in addition to constructing an achievement test. Experience arrived:

1. The members of the experimental group who were taught by flipped learning outperformed the members of the control group by postgraduate physiology.
2. There is an effect of using the inverted learning method on the academic achievement of physiology.

As for the recommendations, it included providing the environmental requirements for modern strategies because they require more complex capabilities than the old strategies.

The effect of using the flipped learning strategy on the achievement of physiology students at the Medical Technical Institute.

**Keywords:** flipped learning strategy, physiology students, Medical Technical Institute.

## Introduction

### Research problem

In the current era, the world is witnessing rapid developments that have forced societies to struggle to keep pace with these successive developments in all fields by working to develop their various systems, perhaps the most important of which is the educational system. Integrated development of the educational system in our time has become imperative in all societies, so that the desired goals and outputs are achieved, with outputs commensurate with the requirements of the present, and at the same time qualified for an effective response. With future developments, as she is a teaching researcher at the Medical Technical Institute, she noticed that most of the students depend on the teacher to possess knowledge and information even though this information is available in sources and books on various internet sites. Through the lecture or by moving away from teaching methods that require presentations or means of communication with students. Given this need, as well as the lack of local research that dealt with the effect of the “flipped classroom strategy” in physiology teaching, the present study came where the problem of our current research can be summarized in the question:

What is the effect of using the flipped learning strategy on the achievement of physiology students at the Medical Technical Institute?

### Research Importance

The era in which we live is characterized as the era of technology and scientific development, and in order for education to perform its various functions; it must keep pace with this development by developing its tools and means to serve the educational process according to the latest developments. Developments (Abdul Salam, 2006: 16). Retaining and retaining information requires modern strategies in the field of teaching, and this requires keeping this information in the memory for as long as possible (Al-Qatami and Al-Nayfa, 1998: 107) and this naturally depends on the time and time factor. Which students need in the learning process as well as the nature and quality of the information that is provided to them (Zaghloul and Hindawi, 2004: 253). Teaching using advanced and modern strategies such as “flipped learning” requires a practical framework that ensures the effective investment of available and possible time and resources, direct and indirect teaching for both the teacher and the learner and takes into account the multiple learning needs of the individual prevalent among students, while at the same time allowing teachers to have the ability to consider The interests and needs of each learner (Adedoja2016: 15). Teaching using advanced methods such as the Flipped Learning Strategy is to help teachers more effectively develop their skills and the mechanics of their day-to-day professional work by developing academic contents and associated teaching and teaching methods and making them available using images from a variety of devices, which helps students access them wherever They were, and at any time they also wanted, by giving teachers the opportunity to take into account the differences that exist among the students; Providing the appropriate educational environment, resources and tools

in which students can choose what suits their learning style (130, Schmidt, M., & Ralph, L. 2016) and the above shows the need to pay attention to modern strategies in the field of teaching in general and strategies for self-education, Including flipped learning in particular, the use of modern strategies by teachers and the provision of a separate atmosphere in which activities and means are varied to empower students and improve their ideas, such as these strategies are increasing to motivate students and their passion for learning (Abu Nahla, 2018). From this point of view comes the importance of activating the "flipped learning strategy" as one of the effective strategies in this field through the preparation of teachers. Which aims to increase the effectiveness of learning and increase its feasibility, through the development of the teacher's capabilities and the educational and scientific self-assertion, and at the same time, it is compatible with the requirements of contemporary life and the accompanying challenges.

The importance of the current research can be summarized in the following:

1. The study provides a theoretical framework on the concept of flipped learning
2. This study will provide an opportunity for students to experience a new type of teaching that they are not used to
3. This study will contribute to motivating teachers to use a contemporary and modern strategy in the field of teaching scientific subjects.
4. It is suggested that the study provide a number of directions for the competent authorities to take into account advanced strategies in the field of teaching scientific subjects.

### **Search objective**

Recognizing the effect of using the inverted learning strategy on the achievement of physiology students at the Medical Technical Institute.

### **From this goal, the following hypothesis can be derived:**

There are no statistically significant differences between the average of the experimental group and the average of the control group in the post-application of the achievement test.

### **Research limits**

1. Human limit: College of Medical Technical Institute receiving Physiology
2. My place: Bab Al Muadham Medical Technical Institute
3. Deadline: The second academic session for the year 2020-2021.

### **Research terms**

#### **First, the reverse learning strategy**

#### **It was previously known:**

1. (Johnsdn "A type of education that depends on technology, which is likely to bring about fundamental changes in the educational context and educational institutions" (45: 2013, Johnsdn)

2. Zhoujing (Zhou Jiang, 2014) is “a two-part teaching technique inside the classroom in the form of interactive activities between students and the teacher and outside the classroom in the form of teaching tasks” (77: Zhou Jiang, 2014).
3. (Al Zabin, 2015) “It is a student-centered rather than teacher-centered teaching strategy, where students watch educational videos using audio-visual and virtual simulations, illustrated techniques, television stories, and worksheets in their homes before class time, while students watch the teacher use class time through Provide an active interactive learning environment in which students are guided and apply what they have learned” (Al-Zaben, 2015: 6).

### **Second: the collection**

It was previously known:

1. (Samara 1989): It is the amount that the learner has achieved in terms of educational goals in a particular subject as a result of passing educational experiences and attitudes (Samara, 1989: 16).
2. (Al-Khalili 1997): It is the final result that shows the level of the student and the degree of progress in learning what he is expected to learn (Al-Khalili, 1997: 6).
3. (Allam 2000): It is the degree of acquisition achieved by the learner, or the level of success that he achieves or reaches in a particular subject, educational or teaching field (Allam, 2000: 305).

### **The researcher adopts a theoretical definition (Allam, 2000).**

Procedural definition of academic achievement: It is the amount of knowledge gained by students in physiology.

### **Third: Physiology**

Its definition (Al-Hujjah, 1986): “The science that includes the study of the functions of the body, such as the study of the functions of the human body and every organ, rather every cell performs its function, and that every function is “related to the function of the other organ, such as the function of the digestive system related to the blood circulation” (Al-Hijjah, 1986, 7).

### **Fourth: The Medical Technical Institute**

It is one of the oldest institutes of the Technical Education Authority of the Ministry of Higher Education and Scientific Research. It includes nine departments and four branches. It works on preparing medical and health cadres of the middle class. The duration of study at the institute is two years in addition to the summer training, and the graduate is awarded a technical diploma.

## **A theoretical framework and previous studies**

### **Theoretical framework**

#### **Flipped learning in education**

(Male Braff, Derek. 2013:43) that flipped classrooms are beginning to gain a lot of interest and popularity, and that by using computer and open educational Internet resources, flipped classrooms are expected to improve student outcomes. To this he adds (Fulton, K. 2012:43)) that in the “flipped class strategy,” the teacher asks students to pre-watch lessons online before class, and then while attending class, asks them to

prepare homework in this period, this action contributed In increasing the effectiveness of students' performance, assignments and exams were used in the classroom. The study concluded that flipped classes are an effective way to disseminate basic physiological concepts to students. Montgomery, Jared 2015: 65) believes that the flipped class gives the learner an opportunity to grasp basic information (minimum knowledge) from a range of topics and materials placed on the web, and this provides an opportunity for learning rather than setting a time limit, allowing the teacher to use class time and interaction Face-to-face in the classroom to train students to graduate skills and advanced concepts strategy brings many advantages of an educational environment that are not realized in education. The environment of the flipped classroom is rich, it is expected that books and communication networks are available in their colors, there are different types of video and educational materials, electronic cards etc., it is also rich in stimuli with different types of education in it in terms of time and space, it provides a collaborative and participatory environment between students exchanging dialogue And discussion before the class, whether face-to-face or through social media, and through which it cooperates together as it works on the absence of the element of fear and threat to the student and makes him feel safe, which leads to enhancing his self-confidence and much more, so this model provides an opportunity for optimal use of time and technology However, this requires redesigning the curricula, in addition to developing the competencies of teachers who are involved in teaching more effectively in the new curricula.

### **Advantages of the strategy**

There are a set of advantages that have been achieved by employing and using flipped learning and these advantages can be summarized as follows:

1. Good use of modern technologies and tools in teaching and educating students
2. The role of the teacher has evolved into a guide, motivator, guide and assistant
3. Emphasizing the importance of students' interaction with the scientific material so that the student becomes a teacher, participant and researcher.
4. Helping students to self-learn according to their individual abilities and differences.
5. Suitable for shy students who require partial repetition of the lesson. They can repeat the lesson several times.
6. Makes good use of study time (Al-Murshidi et al., 2017: 1048)

### **The disadvantages of the inverted row are**

In addition to the above advantages, there are some problems that always appear in the application of this strategy, which are as follows:

1. The flipped class depends on the availability of the internet and technical devices in the students' homes. Therefore, it cannot be applied to anyone who does not have internet.
2. It requires a teacher skilled in technical skills, web applications, and methods of employing them in education.

3. This requires a teacher who has a subjective desire to change, follow up, and discuss students while they are at home, as he needs to provide more time and effort outside official working hours. Therefore, we may find from many teachers who have this desire (Al-Murshidi et al., 2017: 1048)

### Previous studies

A study (Al-Rawafa, 2019) on the effectiveness of using flipped learning in developing the cognitive achievement in science for third graders. The purpose of this study is to determine the evolutionary impact of using flipped learning on the recognized academic achievement of third grade students. . To achieve the goal of the study, the quasi-experimental approach was adopted, and the researcher prepared an achievement experiment consisting of (25) items after modification and verification. In the academic year 2018/2019, it was applied to a research sample of (52) male and female students in the third grade of primary school. They were deliberately selected from the schools (Al-Imama Bint Abi Al-Aas) and distributed randomly. As with the two groups, the experimental group consists of boys and girls who study the modern method (26) and the control group consists of students who receive the traditional method (26). The study suggested using reverse learning to teach third grade students. Study (Al-Suwaidan, 2019): The effectiveness of applying the flipped learning strategy in scientific teaching in the achievement of tenth grade students in Palestine and their attitudes towards it. This study aims to measure the impact and methods of applying the reverse learning strategy in science education on the success of tenth year students in Palestine. This study also attempted to identify the most important obstacles and challenges that prevent the application of reverse learning strategies in the educational process and the benefits of applying this strategy. The study sample consisted of men of the tenth year in a boys' school in Kalkali, 40 boys and 40 girls were selected as a sample, the experimental group studied the flipped lesson strategy as an educational method, and the control group was implemented using traditional teaching. The results of the study showed that there were statistically significant differences in the academic success of the experimental group and the control group after using the reverse learning strategy as an educational method, and the results were positive for the experimental group. Specific classroom strategies are also effective in increasing the level of discussion among students and developing students' active roles in the educational process.

### Discussing previous studies

Based on the review of the two previous studies, the researcher employed these two studies in:

1. Elaboration of the research problem and its importance
2. Define some terms related to the search title
3. Determine the appropriate sample size for the stage and topic
4. Determine the appropriate statistical means for the study.

## Research Procedures

### First: Research Methodology and Experimental Design

The method (experimental studies) was used in the current research, which is considered one of the most accurate studies and can use cause and effect hypotheses, and it is one of the truest ways to solve educational and psychological problems (Adas, 1998: 184) and therefore they chose an experimental design with controls on two groups, one of which is experimental for teaching (Adas, 1998: 184). Reverse learning) and a control group traditionally taught in a research experiment, two groups faced a researcher with a test that measured academic achievement in physiology.

### Second, the research community

The research community consists of all male and female students in medical technical institutes in Iraq who are receiving Physiology for the academic year 2020-2021.

### Third: the research sample

One of the processes that must be followed in following the scientific steps in selecting the sample, because the greater the representation of the research sample by the original community, the greater the guarantee is to generalize the research results to the original research community. (Al-Tamimi 99: 2009) The experimental sample consisted of two parts (a) and (b), and the experimental sample and the control sample were selected by batch. The experimental method (a) and the traditional method (lecture) were chosen for section (b), and the table below defines the characteristics of the two groups.

Table (1) People experience

Total	future variable	the group	Division
30	flipped row	Experimental	A
30	Lecture	the officer	B

### Fourth: Equivalence

Before the researcher begins to conduct the experiment, he must state that both empirical and experimental correspond to a type of variance that he determines based on her knowledge of previous studies, the structure of the theory and the researcher's experience. The equivalence between the two groups was checked by the following:

#### 1- Age

To make sure that both groups match with the estimated historical age in months, I used two independent courses (t) test, where the results show:

Argument (2) the equivalence of the two groups

The result	MD	-NS-		Mother	NS	the number	the group
		NS	NS				

nonfunctional	0.05	2.02	1.901	1.456	237.23	30	NS
				1.458	238.07	30	NS

The result of the previous table indicates that the differences between the two groups are not significant, which is an indication that they are equivalent in age.

### 2- Equivalence in the IQ test

The researcher used (Raven's test) as an indicator of intelligence, and after applying the test to the two groups, the results were as follows:

Table (3) is the equivalence of the two groups

The result	MD	value -t-		Mother	yolk	the number	the group
		NS	NS				
Nonfunctional	0.05	2.02	1.234	1.704	45.83	30	Experimental
				1.643	45.30	30	the officer

From the above, it is clear to the researcher that both groups are equivalent.

### 3- Equivalence in achievement

In order to verify that both groups are equivalent in the pre-test, the researcher proceeded to apply the test to both groups.

Argument (4) is the equivalence of the two groups of achievement

The result	MD	value -t-		Mother	yolk	the number	the group
		NS	NS				
nonfunctional	0.05	2.02	0.761	1.189	18.97	30	Experimental
				1.186	19.20	30	the officer

It can be seen that both groups correspond to the pre-test because the values calculated by the above are smaller than the values in the table and there is no significant difference between the two groups.

### Fifthly: an achievement test

In order for the researcher to confirm the hypothesis and the purpose of the research, she had to prepare an achievement consisting of thirty questions, each question having four alternatives.

## Statistical characteristics of the test

### 1- Authenticity of the tool

To confirm the validity of the test in its apparent form, the researcher presented the test to a group of experts who study physiology. Through this experiment, the researcher confirmed that the test paragraphs are valid in their apparent form.

### 2- Stability test

To calculate the stability of the experiment, the equation (Alpha Cronbach ) on the thirty paragraphs, and the researcher found a stability value of (0.82) when calculating, which is a good percentage of the specified stability level.

### Sixth: The final application of the experiment

After checking and balancing the research tools in the two groups, the researcher applied the reverse learning strategy in the experimental group, but the control group did not change anything in the teaching methods.

### Seventh: Statistical means

Use in the search the statistical bag (Spss )and associated multiple descriptive statistical methods .Such as:

1. T-test for two independent samples
2. SMA
3. standard deviation
4. Percentages
5. Cronbach's alpha equation

## The fourth chapter

### Research results

There are no statistically significant differences between the average of the experimental group that studied with the (flipped learning) strategy and the average of the control group that studied by the lecture method in physiology in the post test. To verify the accuracy of this hypothesis, the researcher applied a post-application analysis to both groups, and to determine the extent of the differences between the two groups, a test was used .t The results were as follows:

Table (6) results of the two groups in the post application

The result	indication	value -t-		Mother	yolk	the number	the group
		NS	NS				
function	0.05	2.02	16,668	1.676	24.50	30	Experimental
				0.759	18.90	30	the officer

It is clear from the above table that the calculated (16,668) is greater than (2.02) in the table, which indicates that there are differences between the two groups, and these differences include the most average group, the experimental group .We emphasize the impact of the strategy used on the student's academic performance. This result is consistent with the findings of studies, which show that flipped learning strategies are effective in improving the academic performance of MIT students. The researcher

believes that although this strategy requires material and technical capabilities, it is important in the field of modern education and learning because it is compatible with the development of contemporary education.

### Conclusions

1. There is a clear effect of the strategy used in the academic achievement of physiology.
2. It is clear that there are differences between the two groups, which is evident in the direction of the experimental group

### Recommendations

1. Research and literature show that it is necessary to attach importance to modern strategies to improve academic performance
2. Striving to provide safe environmental requirements for modern strategies, as they require more complex capabilities than traditional strategies.
3. Work to establish developmental training courses for educational cadres to assimilate the concepts and capabilities of modern methods and strategies.
4. Urging researchers to provide more strategies applicable to scientific materials

### Suggestions

1. The effectiveness of the reverse class in developing the achievement of first-grade intermediate students in chemistry and their attitude towards it
2. Obstacles to applying modern strategies and the possibility of overcoming their difficulty.

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### Appendix

Q1/ Answer two of the following:

A/ Give five functions of the kidney.

B/ Mention the hormones of thyroid gland and the function of each one

C/ Mention five functions of the respiratory system .

Q2/ Answer two of the following:

A/ Draw and label structure of skeletal muscle.

B/ Discuss the cardiac cycle (with drawing)

C/ Draw and label oogenesis of the normal ovary

Q3/ A/ complete the following:

1. Volume of blood in male is about.....liters.

2. By age 80, up to 50 percent of muscle mass may be lost..... and good nutrition may minimize this loss.

3. The normal PH of the blood is.....

4. All lymphocytes derived from stem cells in the.....

5. -tThoracic cage consists of..... Pairs of ribs.

B/ Explain the anatomy of the mammary gland.

Q4/ A/ Enumerate endocrine of the ovary

B/ Enumerate primary and secondary lymphatic organs

Q5/ A/ Classify human blood (ABO blood group)

B/ Explain the spleen (location and its structure)

Q6/ Compare between the following:

A- Cortex and medulla of the kidney

B- Smooth and cardiac muscles