The Impact Of Reflexive Learning Strategy On Mathematics Achievement By First Intermediate Class Students And Their Attitudes Towards E-Learning

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Abstract— Reflected learning strategy has been identified as one of the modern strategies that contribute to the academic success of students in mathematics. With the increasing requirements and the global trend to modernize teaching methods, which focus on students and not the teacher, teachers pay great attention to the use of modern teaching methods and to find their impact on important variables. Therefore, the research aims to find the effect of a reflexive learning strategy on mathematics achievement by first-grade intermediate students and their attitudes towards e-learning in Baghdad. The research community consisted of first intermediate students for the first course for the academic year (2019-2020 AD), and the two researchers adopted the experimental research method, while the research sample was (50) students who were selected by random sample and divided into two groups, one experimental and the other control. The two tools that were used were the achievement test and a measure of the trend towards e-learning. The results indicated that there are statistically significant differences in academic achievement in favor of the experimental group, and students who studied the course through the strategy of reflexive learning were more effective and positive than those who studied by the traditional method, and within the experimental group there is a strong positive trend towards the use of e-learning in teaching.

Keywords— Reflexive learning strategy, Achievement, Attitudes towards E-learning.

1 Introduction

Through the observation of one of the researchers during teaching in the genius school, that the learning environments in the classroom focus only on traditional teaching methods, the most important of which is the lecture or the diction, which negatively reflected on the low level of academic achievement of students, and the lack of excellent class interaction between the professor and his students. He also noted that the faculty members did not use modern, integrated and advanced teaching strategies, among them various e-learning strategies. Hence, the researchers 'desire to use the reflexive learning strategy, which is considered one of the latest educational strategies, which is mixed with fun that generates a beautiful thrill of knowledge, as it helps learners to make The classroom environment is more fun and lively with few lectures and lots of educational projects. In order to achieve educational goals in light of technological innovations, this research came to identify the effect of the learning strategy reflected in the academic achievement of first-average students and the effect of using them on their direction towards e-learning.

2   The importance of theoretical and applied research and its two hypotheses

The importance of theoretical and applied research comes from the importance of the strategy of reflexology as a new and vital topic in the educational field, as the research is a response to the modern trend in the field of information and communication technology, and the need for schools to use integrated teaching strategies in line with the technological and scientific development. The research provides two tools, namely, the academic achievement test for students who are considered gifted and the trend towards e-learning, as they are expected to be used in future research, and researchers may also rely on them in preparing similar tools. The importance of applied research is also evident from its application to intermediate first graders and its attempt to facilitate the teaching and learning of mathematics. This research may benefit researchers in the field of educational technology by conducting other research in different settings and other decisions on this topic. While the two hypotheses were**:**

1-There is no statistically significant difference at the level of significance (0.05) between the mean scores of the experimental group students who studied the prescribed subject using reflexology and the control group students who studied the same subject using the usual method for the academic achievement test.

2-There is no statistically significant difference at the level of significance (0.05) between the mean scores of the students of the experimental group who studied the subject and the strategy of reflective learning and the control students who studied the same subject according to the usual method in the scale of the trend towards electronic learning prepared by the researchers.

2.1. Research Terms

1- Reflexive learning strategy: a strategy that focuses on the student rather than the teacher, as the student watches a video lesson in his home before the lesson, while the teacher uses the class time to guide the student and apply what has been learned (Al-Zabin, 2015: 177). The researchers define it procedurally as: an active and deliberate teaching and learning strategy centered around classroom students The first medium is the education of Baghdad directorates instead of relying entirely on the teacher and depends on delivering the academic content to students before the actual teaching of the lectures, so that students watch the lectures recorded on video clips, flashes and discs outside the classroom at home or anywhere else, and use the actual time of the lecture to provide an educational environment Active interactivity.

2- Academic achievement: the two researchers define it procedurally as "the extent to which students of the first intermediate class / Rusafa Education / 3, Baghdad governorate understand what they have learned from different experiences through a course on educational techniques measured in degrees that they obtain in the achievement test prepared for this purpose and used in the current research." .

3- Trends: It represents the individual's response to a topic with acceptance or rejection, as stated in my definition (Al-Khalili, 1991), (Afaneh, 1999). It also refers to the emotional side that the individual represents, as defined by (Zaghloul and Mahamid, 2007). It is defined by procedure as: the extent of acceptance or rejection responses of the students of the research sample towards their use of the learning strategy reflected in their course teaching measured by the degrees they obtain through the trend scale used in this research.

4- E-learning: It is education that depends on the use of technological media in achieving educational goals and delivering educational content to learners without regard to temporal and spatial barriers. These electronic media may be represented in modern electronic devices such as computers and receivers from satellites, or through computer networks represented by On the Internet and the other media it has produced, such as educational websites and electronic libraries "(Muhammad, 2006).

3. Theoretical Background and Previous Studies

3.1 Reflexive education: In light of the technological and cognitive development, the focus on technology and the Internet has become a very important matter, and teachers have to acquire positive trends towards the use of technology in teaching to build students 'personality and provide them with effective skills. As the integration of technology in education and the development of teaching methods, methods and strategies (Tuan & etc., 2005)). This strategy is an educational model that integrates learner-centered learning with teacher-centered learning and includes interactive learning activities for small groups in the classroom, and direct individualized learning based on technology in computers (Abu Mughanem, 2014: Reflective learning is a modern concept for treating the weakness of traditional education and developing students' level of thinking skills. It is a teaching strategy that relies on the use of technology to benefit from education. It enables the teacher to spend more time in his interaction, dialogue and discussion with his students in the lesson instead of meeting him. The student watches the educational video presentations of the course at home, and the best time for discussion remains in the classroom under the supervision of the teacher (Al-Zein, 2015: 33).

Stages of implementing reflexology: Al-Kheili called it the Six Ds because it is very important to define the lesson in which the chapter intends to be reversed, as it is required to be suitable for the opposite, and then analyze the content for values, skills and concepts that must be known. And design the educational video so that the material includes sound and image in a time not exceeding ten minutes. And directing students to watch the video from the Internet or CD-ROM at any time at home. And applying the concepts that the student learned from the video in the lesson, with discussion. And evaluation of student learning within the class with appropriate assessment tools. (Al-Kuhaili, 2015)

The pillars of reflexive learning: To effectively implement the reflex learning strategy, there must be four pillars, which are the availability of a flexible learning environment. And a change in the concept of education, and careful thinking in dividing and analyzing content. Finally, qualified and trained teachers are available (Sharman, 2015). Advantages of Reflexive Learning: Contributes to the utilization of class time with additional notes and questions on the topic of the lesson, reinforcing what has been learned through the teaching method reflected in their homes (Nwosisi & etc, 2016). The teacher helps the students to rehabilitate by distinguishing their acquired abilities (Neaupane, 2017). And it creates an atmosphere of fun in learning for students (Overmyer, 2014). It is a shift by learning from passive to active in order to reach deeper and more effective learning (Neaupane, 2017).

The importance of reflexology is Achieving balance in Bloom's classification of educational goals and planning school educational experiences. The reflex class teacher is the teacher who is interested in three important aspects in creating learn-ing: hearing and sight And movement. Reflexology combines two: previous learn-ing by means of audiovisual technology and the practice of procedural experience in the classroom in achieving the required balance to achieve awareness and meaningful learning. Saving class or lecture time instead of consuming it in the explanation that may be forgotten. The focus of the learning process is the student in line with the needs of digital development. Individualization and independence of learning, every student learns in the appropriate way and at the appropriate time. (Al-Kuhaili, 2015)

3.2 E-learning: This concept has passed since its emergence and development in three generations. The first generation in which electronic content was on CD-ROM. The interaction through it was one-on-one between the

student and the teacher, with a focus on the role of the student. As for the second generation, it appeared with the beginning of the use of the Internet, where the method of delivering content evolved into a network method, the content evolved with it to a certain extent, and the process of interaction and communication evolved from being individual to collective, with the participation of a number of students with specific teachers. And finally, the third generation with the beginning of the concept of e-commerce and electronic security appeared and this coincided with the rapid development of multimedia technologies, virtual reality technology and satellite communication technology, which allowed the development of the third generation of e-learning until it reached the current concept that relies on the use of electronic media in delivery The reception of information, the acquisition of skills, and the interaction between the student and the school, and between the school and the teacher (Mustafa, 2016: 75). (Anderson, 2008)

Pros expected from the e-learning application; Despite the negatives in the application of e-learning, there are many positives that cannot be overlooked, as the convenience and flexibility provided by e-learning in terms of enabling the learner to choose the right time to learn, as well as choose the place he wants. And employing multimedia (voice - image - text - color ... etc.) in the education process, which helps the learner to interact with it and employ many capabilities, and hone skills. It is less expensive than traditional education and this is linked to educational economics. It is considered a suitable system for educating adults and training employees whose circumstances may not allow them to go to schools and universities, or to train in institutes for that. It seeks to improve and enrich the level of education and develop intellectual capabilities. As it works to develop the method of lecture in university education. It provides great opportunities for learning (Ismail, 2005).

3.3 Previous studies: Study (Qeshta, 2016): The Effect of Reflected Learning Strategy on the Development of Concepts and Reflective Thinking Skills among Tenth Grade Basic Students. The sample was (80) students from the tenth grade of primary school in Amna Bint Wahab School for the academic year (2015-2016). They were distributed among two popular groups and were chosen randomly. The analytical descriptive approach and the experimental approach were used, and the study tools were the content analysis tool and the teacher's guide in reflected learning, testing scientific concepts and reflective thinking skills. The study was applied and the most important results were reached, the most important of which was the presence of statistically significant differences in the concepts test and the reflective thinking test between the mean scores of the students in the experimental and control group in favor of the experimental. The study (Abu Jalba, 2016): It aimed to reveal the effectiveness of the flipped classroom strategy by using the Edmodo website in developing creative thinking and the trend towards biology among first-grade secondary school students in the city of Riyadh. The experimental approach was used and the number of the sample was (56) students, who were distributed into two experimental and control groups. The Twarnes test for creative thinking and a measure of the trend towards biology was used. The most prominent results were the presence of statistically significant differences between the experimental and the control in the skills of creative thinking and the trend scale in the telemetry in favor of the experimental. Study (Al-Dossary and Ahmed, 2017): The effectiveness of applying the flipped class strategy to academic achievement to learn programming in a computer and information technology course among first-grade secondary school students. A quasi-experimental approach was used, and the sample was (48) students from the first grade of secondary school at Al-Shifa Secondary School in Riyadh. The two researchers designed an achievement test to measure the fulfillment of the research hypotheses, and the sample was divided into experimental and ablative, with pre and post tests performed on the two groups. The results showed the effectiveness of the flipped classroom strategy in students 'achievement of learning programming in the computer and information technology course in favor of experimental at levels (analysis and synthesis, testing as a whole). There are no statistically significant differences at the evaluation level. The most important recommendations were to encourage computer teachers to implement the flipped classroom strategy in their teaching of the programming unit and to provide technical support for teachers in schools to design digital contents.

 The current research has benefited from it in:
1- Defining procedural definitions for search terms.
2- Choosing the appropriate experimental design for the nature of the research.
3- Determine the statistical methods that are used to verify hypotheses and analyze data.
4- Preparing research tools, namely the achievement test and the trend scale.
5- Interpretation of the results logically.
6- Knowledge of new sources that enrich research.

4.Research methodology and procedures

4.1 The researchers adopted the real experimental designs with two equivalent groups with a post-test to measure achievement, and the experimental design can be expressed in the table 1.The research community is represented in all middle class students in Iraq in the Baghdad Education Directorate, Rusafa and Al-Karkh, the morning study for boys for the academic year (2019-2020). As for the research sample, in light of the experimental design, the two researchers intentionally chose the genius intermediate school affiliated to the Baghdad Education Directorate, Rusafa / 3, the morning study for boys for the academic year (2019-2020) because one of the researchers works as a teacher. It is one of the schools affiliated with Al-Tahadi Schools, which includes the

schools of geniuses, intelligent people, and scholars. Division (A) was chosen randomly to be the experimental group according to the reflexive learning strategy being taught. Division (B) to be the control according to the usual method is taught, and accordingly the number of the research sample is (50) students, at a rate of (25) students for each group. As for the control procedures, we begin with the internal integrity of the experimental design is achieved when the researcher makes sure that the extraneous factors can be controlled in the experiment if there is no effect on the dependent variable (Al-Zobaie and Mohammed, 1981, 97). Therefore, the researchers, before starting the application of the experiment, conducted parity between the students of the two research groups in variables that may affect with the independent variable in the dependent variables, which may affect the results of the research. These variables are the chronological age of the students, previous achievement in mathematics, the educational level of the parents, and the test of previous knowledge of mathematics. It was confirmed that the experimental and control groups were equivalent before conducting the experiment. As for the external integrity of the experimental design, it depends on the extent to which the individuals of the experiment represent the large group to which they belong and the extent to which the results of the experiment can be generalized (Al-Zobaie and Muhammad, 1981: 98). All factors that may threaten the integrity of the design have been controlled. By determining the length of time for teaching, and equal number of lessons during the week, by organizing the weekly schedule of lessons for the two research groups, five classes each, the experimental group was divided into five small groups of varying degrees of achievement in a classroom alone, while the officer studies in the usual way in a classroom Other, students of the two research groups were not subjected to neglect, dropping out, or moving from one class to another during the experiment. The research tool (achievement test) was applied, and then the researchers corrected the examination papers for the two groups, and accordingly it can be said that the two research groups were exposed to the same external conditions, and thus external safety has been achieved. Based on the above, the researchers decide that generalizing the results of the current experiment fall within the limits of the characteristics of the experiment community.

Table 1. Experimental Design for Research

Groups	Equivalent The two groups	Experience	variable Dependent	Scale Fourth variable
Experimental group	Age in months Intelligence Mathematics previous achievement The educational level of the father and mother Previous test information In mathematics	Teaching by using Reflexive learning	Attainment The trend towards electronic education	Achievement test
Control group		Teaching by the traditional way		Trend scale

4.2 Research tools:

1-Building the achievement test: The mathematics textbook for students of the first intermediate grade of the academic year was chosen, and from it the second semester (relative numbers) was chosen, which represents 20% of the curricular content of the course. When setting the achievement test, consideration was given to defining the behavioral educational objectives for the cognitive domain of Benjamin Bloom, which contains six levels of knowledge, remembering, understanding, application, analysis, synthesis, and evaluation. And then preparing a table of specifications after determining the knowledge objectives that the test contains, the researchers developed a detailed chart that includes the basic elements of the content of the subjects for the chosen study, which is known as the table of specifications. And when developing the test vocabulary, it was taken into account that it measures the levels of the six cognitive domain. And that the questions are clear and linked to the educational objectives, and that each paragraph measures an educational outcome specified or allocated in the specification table. And that the questions take into account the individual differences between students. The questions are inclusive of the specific course. And the time is appropriate for the number of questions. When determining the number of test items, the conditions mentioned by specialists in educational measurement were adhered to. In order to calculate the apparent validity factor of the test, it was presented to a number of arbitrators from professors of measurement, evaluation and methods of teaching mathematics. The selection time was increased from two to three hours, and the researchers took all the observations presented by the arbitrators, and thus the researchers made sure of the apparent validity of the test. To calculate the test reliability coefficient, the two researchers chose the half-segmentation method (for Spearman - Barron) by dividing halfway (even and odd questions) and using the correlation coefficient according to Pearson's equation. The correlation coefficient reached (1.02). The reliability coefficient reached (1096), which is a high reliability coefficient. On the reliability of the test and its suitability for use, the square root of the reliability coefficient was calculated, which amounted to (0.96).

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2-Building a scale for students' attitudes: To build the scale, the educational literature related to trends and their characteristics and the criteria that must be taken into account when constructing them was relied upon. Researchers also examined a number of trend scales prepared by previous researchers, and took into account when preparing it the need for its paragraphs to reflect emotional intensity, in light of the criteria that He mentioned it (Al-Khalili, 1991). The two researchers prepared the students' attitudes scale from (30) paragraphs in its initial form and with a three-dimensional scale (agree, hesitant, disagree) to measure three dimensions which are the students 'attitudes towards using reflected education in teaching the course compared to the lecture method. And the students 'attitudes towards the use of reflexology in developing the skills of producing educational technologies. And students' attitudes towards using education as a teaching strategy in general.

4.2 Research results:

1- To verify the first null hypothesis, "there is no statistically significant difference at the level of significance (0.05) between the mean scores of the experimental group students who studied according to the reflexive learning strategy and the control group students who studied according to the usual method of academic achievement." After correcting the students' answer sheets and calculating the total score for each student in the two groups, the arithmetic mean and standard deviation were calculated for both groups, as shown in Table (2) below. It was found that the average scores of the experimental students were higher than the average scores of the control group students on the achievement test. However, the two researchers wanted to know the significance of the difference between the mean scores of the two groups to test the validity of the above hypothesis. And using the T-test for two independent samples, it became clear that the difference between them was statistically significant at the level of significance (0.05), with the degree of freedom (46). Thus, the first null hypothesis is rejected, and the alternative is accepted, meaning that there is a difference between experimental and control, and that this difference is in favor of the experimental group over the achievement test.

2- In order to verify the second null hypothesis, "There is no statistically significant difference at the level of significance (0.05) between the mean scores of the experimental group students who studied according to the reflexive learning strategy and the control group students who studied according to the usual method in the trend towards e-learning scale prepared by the researchers." . The students 'answer sheets were corrected and the total score was calculated for each student in the two groups, and then the arithmetic mean and standard deviation of the students of both groups were calculated as shown in Table (3). The mean scores of the experimental group students in the trend towards e-learning scale were higher than the control scores in the trend towards e-learning scale. By using the T-test for two independent samples, it was found that the difference between them is statistically significant and thus rejects the second null and accepts the alternative. This means that the experimental students outperformed the response of the control students in the scale of the trend towards e-learning.

Table 2. The results of the T-test to find out the significance of the difference between the mean scores of the experimental and control groups on the achievement test

Groups	No.	Mean	S.D.	t-test value tabular	t-test value calculated	Degree Of freedom	Signi. level	St. sig.
Experimental	25	68.39	7.719	2.00	3.893	48	0.05	significant
Control	25	60.14	6.691					

Table 3. The results of the T-test to find out the significance of the difference between the mean scores of the experimental and control groups for the scale of the trend towards e-learning

Groups	No.	Mean	S.D.	t-test value tabular	t-test value calculated	Degree Of freedom	Signi. level	St. sig.
Experimental	25	90.48	14.44	2.00	0.42	48	0.05	significant
Control	25	90.08	15.05					

4.3.Explanation the results of search:

The results of the research indicate that the performance of the experimental group students who studied using reflexology over the performance of the control students who studied in the usual way of achievement. It is due to the fact that the use of a teaching reflexology strategy includes cooperative learning and group discussion, and the student feels that he has a great role in learning. There is a great focus on encouraging students and providing support to each other, in addition to that, researchers see the superiority of empiricism over control, due to the fact that teaching using a strategy of reflexology according to sequential and organized steps led to the mental organization of students and thus led to an increase in achievhent. The adoption of the reflexology strategy on the principle of dialogue and discussion helped students to activate the previous knowledge they possessed on the topic. Finally, dividing students into heterogeneous levels of achievement leads to an exchange of views among students and for those with a low level of achievement to benefit from their high-achieving colleagues.

5.Conclusion.
 1-The positive effect of a reflexive learning strategy as a teaching method in increasing achievement, compared to the usual method for intermediate first grade students.
 2-The teaching procedures according to the reflexive learning strategy are consistent with what modern education focuses on in making the learner the center of the educational educational process and adopting work and experience as a basic pillar of education.
 3-Teaching using a reflexive learning strategy to a large degree encourages students to be free to ask questions and raise them, and to participate positively during the lesson (by observing the researchers during the application of the experiment) and this is an indication of increased student motivation.

6.Recommendations
1-That mathematics teachers adopt the strategy of teaching reflected in teaching because of its positive impact on achievement.
 2-The necessity of training the teaching bodies in schools to follow modern strategies in teaching in teaching mathematics curricula by holding continuous training courses for teachers of mathematics and its teachers on how to adopt modern models and methods of teaching, including the strategy of teaching reflected during service.
 3-Teaching methods curricula in colleges of education and teacher institutes include modern strategies in teaching, including reflexology.
 4-Preparing a similar research in mathematics for different stages of study.
 5-Conducting research to identify the impact of learning reflected in mathematics on other variables such as gender, motivation, tendencies, and thinking of all kinds.
 6-Comparing the effect of using reflexive learning with other strategies on achievement.

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