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The Impact of Using Flipped Classroom Strategy in the Development of Self-Organized Learning and the Trend towards Science among Ninth Grade Students

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Abstract

The purpose of this study is to investigate the effect of using of the flipped classroom strategy on self-organized learning and the trend towards science, in order to achieve this objective, the researcher used three tools: scale of self-organized learning and scale of trend towards science, and card interview to identify the benefits and the obstacles of the experiment .The sample of the study consisted of (36) students from ninth grade, the sample was divided into experimental group of (18) studied using the flipped classroom strategy, and a control group of (18) students studied in the ordinary way, the experiment lasted for three weeks and included 12 lessons, the most significant results were as follows:

1. The level of self-organized learning of the students were in the following order (academic motivation "high"; self-control "average;" the strategy adaptation "below average").
2. Flipped classroom strategy impacted positively on the trend towards science among the experimental group students.
3. There are differences between the number of activities and exercises that have been completed for the experimental group students.

Keywords: Flipped Classroom Strategy, Self-Organized Learning, Trend towards Science, Ninth Grade Students

Introduction

Communities believe that competent and effective teachers are the cornerstone of any strong education system. Accordingly, they are expected to be proficient in using various teaching strategies, and experts in the content of curricula and modern teaching methods, and they have the necessary competencies to manage the class in an exemplary manner, and they have comprehensive knowledge and awareness of the level of development achieved by their students, in addition to their mastery of the subject that they are teaching.

Zaitoun (2003) stresses that proficiency in teaching is represented in all experiences and knowledge that are reflected in the behavior of the trained teacher, and appear in professional patterns and behaviors during the role he exercises when interacting with all elements of the educational situation. One of the most important roles for a teacher is to perform the evaluation process; he must be familiar with its concepts, foundations, and competencies, as there is not a list of the competencies lists required for the teacher in any educational stage of the competencies of the evaluation (Abu Samaha, 1993).

In light of the explosion of knowledge and technological development, recent trends in education call for a shift from interest in knowledge and information as goals in and of themselves to the development of students' minds, and giving them the ability to infer, criticize, innovate, innovate and creativity, and that habits of the mind be a major goal in all stages of education, and move from focusing on providing information and collecting it to training in thinking skills, and developing the habits of the student's mind to use different types of mental performance through which he uses mental processes and skills to face new experiences and situations in the practical life that may not have been present originally when he was sitting on the school benches. Habits of the mind mean that we prefer a pattern of intellectual behavior over others, it means making choices about which patterns should be used at a particular time (Amor, 2005; Costa & Kallick, 2015). Therefore, the incorporation of

habits of the mind in the course of measurement and evaluation, and the various decisions in general, helps learners to use thinking processes to be able to information, discover the meaning themselves, and produce knowledge as a step towards lifelong learning (Ibrahim, 2013).

Habits of mind have become one of the most prominent educational methods that are used to enhance students' thinking processes, develop the ability to solve problems, and improve the ability to use alternative strategies (Elyousif, Y. & Abdelhamied, 2013).

The theoretical trends varied in its vision to study habits of the mind, according to the theoretical approach to it, and thus several classifications appeared, the most prominent of which were:

"Marzano Classification", "Productive Mental Habits Classification," Hyerle Classification, "Daniels" Classification, "Project 2061 in Science, Mathematics, and Technology", AAAS Project (2061, Covey Classification), and Sizer & Meier Classification, and the classification (Costa & Kallick) where they classified habits of mind in (16) habits. The current research relied on the "Costa & Kallick" classification of mind habits, as this classification, as Nawfal (2010) pointed out, is one of the most convincing classifications in explaining and interpreting habits of reason;) because of its reliance on the results of more research studies than other multiple classifications that preceded it, and the habits are:

Perseverance - applying previous knowledge to new situations - listening with understanding and empathy - controlling recklessness - thinking flexibly - metacognition - searching for humor - striving for accuracy - questioning and posing problems - thinking and communicating clearly - constant readiness for continuous learning - using all the senses to assemble Data - creativity, imagination and innovation - responding in amazement and awe - taking calculated risks - reciprocal thinking.

Some studies have suggested that habits of the mind can be acquired through training programs for those habits outside the academic content. Marzano et al. (1999) see the possibility of using a set of steps, procedures, activities and strategies to help pupils gain habits of the mind while teaching different courses to be directly and explicitly reinforced, this is confirmed by the study of Costa & Callick (2015) that it is necessary to pay attention to integrating the mind habits into the lesson plan clearly, and to design a rich learning environment responsive to the brain, providing students with opportunities to access to the practice of thinking, and caring for others.

While Lowry (1999) sees one of the main reasons for the failure of formal education is that educators start with abstract matters through printed materials and through verbal language rather than physical verbs and behaviors, and attitudes toward real things as habits of reason, Hart and Keeler (2003) add that a reduced conceptual assimilation capacity may be attributed to the habits of reason followed by the disciples. Rota (2004) emphasizes that developing habits of the mind helps in organizing the learner's knowledge repository, managing his ideas effectively, and training him to organize assets in a new way, and looking at things in an unfamiliar way to organize existing knowledge to solve problems, (as mentioned in Mazen 2011, and fathallah (2010). Therefore, Taher (2013) considers that mental habits are among the important variables that have to do with the academic performance of students at different levels of education, and the need to pay attention to their development to improve achievement.

Research questions

The study attempts to answer the following main question:

What is the effect of the use of the flipped classroom strategy in the development of some of the components of self-organized learning and substance orientation among 9th graders?

It consists of the following questions:

1. What is the effect of using flipped classroom strategy on some of the components of self-organized learning for students of the ninth grade?
2. What is the effect of the use of flipped classroom strategy on material orientation for ninth grade students?
3. What are the main benefits to students when using a flipped classroom strategy from their point of view?

4. What are the obstacles faced by students when using a flipped classroom strategy, from their point of view?

The Objectives of the Study

The current research aims to:

1. To recognize the impact of teaching science using the flipped classroom strategy on some self-organized learning components for ninth grader students.
2. Identify the impact of science teaching using the flipped classroom strategy on the material orientation for ninth grade primary students.
3. Identify the differences between the exercises performed by the students of the experimental group and the control group.
4. Identify the benefits to students when using strategy.
5. Identify the obstacles facing the ninth grade primary students.

The Importance of the Study

The importance of the research is as follows:

1. Integrating technology into teaching and learning science.
2. - Provide procedural steps to present the steps of using the strategy.
3. Provide an experience in which the science teachers benefit from it.
4. Enriching the educational field for procedural research to exchange experiences among those interested in science education and learning.

The Definition of Terms

Flipped classroom:

The researcher defined it procedurally as: provide the scientific material and the tasks required in advance by the video tutorial, with the aim of focusing on the activities and training and discussion within the class, and from it to address the largest possible number of skills, concepts and ideas during the class.

Brame defines it as students acquire knowledge through exposure to new materials outside the classroom, usually by reading or lecturing videos, then use classroom time to do the hard work of absorbing that new knowledge, perhaps by solving problems, discussing, or holding discussions.

Self-Organizing Learning:

Ismail et al., 2012, p. 43 defines it as: The procedures followed by the learner in organizing the motivational and cognitive aspects beyond knowledge and environment related to the learning, in order to achieve academic goals.

The researcher defines it procedurally as: The student's ability to follow up the course material and carry out the tasks assigned to him regularly, and follow up the extent of achieving this and work to improve and the development of his scientific achievement motivated and self-monitoring.

The trend towards mathematics:

Ma, & Kishor (1997) defines it as: "A complex act of love or hate for science, and a tendency to participate in or avoid scientific activities, and a belief that the individual is good or bad in science, and the belief that science is useful or useless (p.27).

Limitations of the Study

Objective limitations: The unit of "Operations on normal fractions" included in the mathematics course for the ninth grade primary of the second semester. Edition 1433 H

Temporal limitations: The second semester of the academic year 1435-1436 H.

Previous Studies

Several studies have found the effectiveness of different strategies in developing habits of the mind. Ali's study (2009) demonstrated the effectiveness of using branched thinking strategies to raise the level of achievement (the third-higher level of knowledge), the habits of the mind represented by flexible thinking, and thinking about thinking (Metacognition), and fun thinking about mathematics for fourth-graders.

The results of Obeida's study (2011) showed the effectiveness of using the studio of thinking in developing habits of the mind in teaching mathematics among middle school students.

The results of the Al-Sawah Study, 2011) found the effectiveness of a training program in developing some mind habits produced by a group of female students who are teachers of kindergarten.

Hilal (2013) reached a strategic effectiveness based on the six thinking caps in achieving mathematics (engineering), developing some habits of the mind (investigating accuracy, applying previous experience to new situations, flexibility in thinking, impulse control, and perseverance) among first-year high school students.

The study of Hazard (2013) also indicated the necessity of developing the habits of the mind of new students in universities so that they can face the academic, intellectual, emotional and social challenges they face with the beginning of joining the college, adapting to the academic requirements, and pushing them to positions that facilitate their transition to effective learning.

As for the study of (Kallick, et al., 2013), its results indicated that teacher training programs need to be developed to help students develop better scientific habits of the mind if they want to participate more effectively in the decision-making process, and discuss socio-scientific issues in their classes.

The study of Olaimat (2013) concluded that there is an effect of a program based on multiple intelligences in developing habits of the mind, and the effect of learning remains in the kindergarten child.

The study of Salah (2013) revealed the effectiveness of a training program based on the activities of the scientists Club in developing all habits of reason produced by a sample of third-grade students, and the absence of a difference between males and females in them, and the superiority of experimental groups over the control in maintaining the impact of learning.

Khalil's study (2014) also demonstrated the effect of mind maps on developing scientific concepts, visual thinking, and some habits of the mind (flexible thinking, reciprocal thinking, and metacognitive thinking) among fourth-grade primary school students in science.

The results of the study of Al-Azab and Ahmed Weiss (2014) showed the effectiveness of using the structural constructive Baybe model in developing some mind habits of the people's scientific students in the College of Education.

Ramadan study (2014) revealed the impact of Skamper's strategy in developing achievement, problem-solving skills, and some habits of mind in the science subject for fourth grade primary school students.

The study of Morgan (2015) also found the effectiveness of a program based on participatory teaching in teaching mathematics to develop some habits of mind among middle school students. The study of Jad Al-Haq 2015 (to develop some cognitive thinking skills and habits of reason) using visual thinking networks to teach science to the first preparatory students.

As for the study of Al-Zein (2015), it demonstrated an effect of using the inverted learning strategy in the academic achievement of students of the Faculty of Education at Princess Nora Bint Abdul Rahman University, and this is what Al-Mutairi's study (2015) demonstrated in terms of the effectiveness of the inverted classroom strategy, using the educational platform (Edmodo) in academic achievement according to the levels of the whole as a whole, in the levels (knowledge - application - reasoning), and in developing self-learning skills in the biology course for first year secondary students.

The Zahrani Study 2015) resulted in the effectiveness of the inverted class strategy in developing the level of (cognitive achievement according to the levels of Bloom six as a whole, and at the higher levels (application, analysis, installation, and evaluation) in particular in the e-learning course for students of the Faculty of Education at King Abdulaziz University.

Methodology

Population of the Study

The study population consisted of all ninth grade students enrolling the public schools in Irbid during the academic year 2014/2015.

Sample of the Study

The sample of the study consisted of (36) ninth grade students distributed into two groups; (18) students control group and (18) students experimental group

Tools of the Study

1. Self-organized learning scale:

The researcher benefited from the scale in the study of both (Al-Miqdad, 2013), (Saleh, 2013) three axes were selected from the scale which is: (Academic motivation, self-monitoring, strategy adaptation) for its relevance to the study sample, the researcher modified some paragraphs to suit the study, A triple gradient was identified (always, Sometimes, rarely)to express students' opinions.

2. A scale of direction towards the material:

The researcher benefited from the trend scale prepared by Al-Maqshoshi (2008) in the study (Al-Azrwi, 2014), The researcher chose positive paragraphs only to identify the impact of the strategy on the direction or did not affect and the gradient was determined (Agree, disagree, not sure) to express opinions.

3. Educational Videos:

Eight educational videos were produced by the researcher using screencast-o-matic.com and then send it to the students in the preceding day.

4. Interview:

The researcher used the design of an interview card (Appendix 4) and used the collective interview for the students of the experimental group, where he divided students into two groups to monitor the most important benefits and constraints encountered when dealing with strategy.

5. Form :

Where the researcher designed a form distributed to all students in the classroom to monitor the number of activities that the student solves in each lesson in paragraphs (Make sure - training - issues of higher thinking skills), the aim of the form is to make a comparison between students' achievement in the experimental and control groups.

6. A group in WhatsApp:

The researcher made a group in the WhatsApp that includes the students in the experimental group, in order to send lessons and assignments and answer the students' questions.

Steps to conduct the research:

1. Select the module.
2. Measuring the students' orientation towards science, and measure self-organized learning level.
3. Identify students in the experimental group based on knowledge of students who have a means of communication.
4. Production of educational videos, and then send it to students on schedule.
5. Explain the lesson during class as usual to students of the control group, and give the opportunity for students in the experimental group to accomplish the tasks required.
6. Follow up and evaluate the work of students in the experimental and control groups.
7. Follow up and urge students to monitor the completed paragraphs, with the aim of reaching accurate results.

8. Distribution of self-organized learning measurement form, and the scale of the trend towards Article for the students of the experimental group after the end of the unit lessons.
9. Analyzing, discussing and interpreting the results.

Results of the Study

Results related to the first question

Table (1): Students' views on expressions that represent the self-learning scale

M	Skill	Items	Always	Sometimes	Rarely
1	Academic motivation	I give up my favorite activities to get an idea of the lesson.	6	2	1
2		I give up practicing my activities in order to carry out the required tasks.	7	2	-
3		I make the necessary effort in order to excel on others.	9	-	-
4		I make the necessary effort to win the admiration of others	9	-	-
5		I make enough effort to gain new skills.	5	3	1
6	Self-monitoring	I make sure that my approach to the educational strategy is done as it should.	4	3	2
7		Take other strategies to understand the lesson	4	2	3
8		I always compare my performance with the performance of my colleagues to make sure that my performance is going properly.	4	4	1
9		I have kept a record of my performance to monitor and control the progress that I made.	2	1	6
10		Do exercises to learn how much I can do the lesson.	8	1	-
11	Adaptation strategy	I change my approach when I need to get the best use of the strategy Which I followed.	1	1	7
12		I identify the mistake that I made when I did not succeed in learning the lesson.	3	3	3
13		I make sure that I make the necessary adjustments to the mistakes I made while learning the job.	1	3	5
14		I reward myself for discovering and modifying my mistakes.	5	2	2

As can be seen from the table above, for the following axes:

A. Academic motivation

That all students are making an effort to excel on others as well to embrace the admiration of others from their peers, and there are also an acceptable proportion of students who abandon their practices in order to get an idea of the lesson and take the required tasks.

Overall, we can say that the flipped classroom strategy has positively affected the academic motivation of the students.

B. Self-monitoring

It is clear from the table that the total self-control of students is almost average, they have the words "I do exercises to know the degree to which I can take a lesson." This is evident through the results of the comparison in the number of activities carried out with their colleagues in the control group, while it is clear that most students do not have a record to monitor their progress and achievements.

C. Adaptation of the strategy:

It is clear from the table that the overall level of adaptation of the strategy is below average. It is also clear that most students do not change the way they follow the strategy and simply follow the video to understand the lesson.

In conclusion, we can say that the flipped classroom strategy has had a positive effect on self-learning, where the level of self-organized learning was low in all components of the scale in tribal measurement.

Results related to the second question

Table (2): Students' views on expressions that represent a scale of direction towards the material

M	Dimensions	Phrase The flipped classroom strategy contributed to:	Agree	Not sure	Disagree
1	Science teacher	I am happier seeing the science teacher.	7	2	-
2		I feel that the science teacher treats students fairly.	6	3	-
3		I accept the directions of the science teacher.	8	1	-
4	Learn Science	I prefer science classes on other materials.	7	1	1
5		I would like to help my colleagues solve scientific issues.	9	-	-
6		I am keen to develop my skills in science.	3	4	2
7	Enjoy the science	I'm happier when I learn something new in science.	8	1	-
8		I enjoy studying science.	6	2	1
9		I feel fun when I participate in science activities.	9	-	-
10	The importance of science and its use in life	I think that science is working on the development of my thinking.	6	3	-
11		I feel that science has important applications in everyday life.	7	1	1
12		I believe that science is necessary in the service of society.	4	3	2

It is noted from the above table that the flipped classroom strategy has positively affected the formation of a trend towards the material in general, and it is also clear that there are many phrases that the students agreed upon, such as:

1. I like to help my colleague in solving the scientific issues:

This was already observed during the period, and the students in the pilot group were used to implement the peer education strategy.

2. I feel fun when I participate in science activities:

This is illustrated by the number of activities carried out for each student in the monitored activity monitoring form (Appendix 3).

And to denote the positive trend towards the science teacher, this is due to frequent communication during work or out of work in the group assigned to accompany the missions, where students interacted with the experience and increased the rates of their discussions and inquiries.

Results related to third question: What are the benefits to students when using flipped classroom strategy and follow-up educational videos?

A set of benefits has been identified, as follows:

- The possibility of reviewing the lesson more than once, if needed.
- Follow the video at any time suitable for the student.
- Helped solve a lot of activities.
- Helped motivate students to do great effort.
- Exploitation of time.
- Know the tasks and duties required before the period.

Results related to the fourth question: What are the obstacles faced by students when using flipped classroom strategy and follow-up educational videos?

A range of constraints was identified, as follows:

- Mobile network interruptions.
- Disable mobile.
- Follow up a video about a colleague, If there is no mobile.
- Delay sending video tutorial by the teacher for some lessons.

Recommendations

1. Teacher training on inverted grade strategy.
2. Train teachers on programs that help them produce educational videos.
3. Make programs for students to develop the concept of self-esteem.
4. Encourage students to monitor observations on their performance and achievements, and to indicate the importance of this in helping progress and development.
5. Statements of the importance of self-reward when achieving achievement and encourage them to detect and modify errors, so that we develop in our students the importance of self-esteem and keenness on improving the work.
6. Design courses with training and models inspired by inverted classes, and expand the application of such programs at the national level in all educational stages.
7. Training faculty members on strategies and programs to develop the habits of mind and the competencies of the evaluation, and the strategy of the inverted rows.
8. Include teacher training programs, training on the inverted row strategy.
9. Conducting research on the effectiveness of a program based on inverted classes in skills development, such as self-learning, problem solving, surveying, self-organizing learning, and thinking beyond the cognitive and creative.

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