

*Flipped Classroom for Teaching Science to develop
the scientific concepts and motivation towards
Learning For Prep Stage Students*

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Abstract

This research aimed to know the effectiveness of the flipped classroom in developing scientific concepts and developing motivation towards learning for first-year preparatory students. According to the inverse chapter for the students of the experimental group, the two measurement tools were: (1) Testing the scientific concepts included in the unit (energy) assigned to the students of (first preparatory grade), in the light of the levels of CAPS, the measure of motivation towards learning, and using the experimental method with the experimental and control groups, The two research groups were selected from among the pupils of the first year of middle school in the Matai Educational Administration, which consisted of (108) female students, of whom (54) female students for the experimental group, (54) female students for the control group, and the results reached to the effectiveness of the flipped classroom in teaching the power unit to develop concepts. The scientific study for first-grade preparatory girls in the preparatory school for girls in the Matai Educational Administration, the lack of effectiveness of the flipped classroom in teaching the energy unit to develop the motivation towards learning for the first-grade students. The first preparatory school in the preparatory school for girls in the Matai Educational Administration, and there is a

statistically significant correlation between the scores of the first preparatory grade students in the scientific concepts test and their scores in the measure of motivation towards learning in the post application.

Keywords: Flipped classroom - Scientific concepts - Motivation towards learning

Introduction:

The current century is witnessing an information revolution that appears in technological progress, rapid and tremendous developments in scientific knowledge and new and successive discoveries in a world characterized by rapid change. Studies are important and effective in the field of teaching, as it depends on reversing teaching procedures so that lessons and their content are viewed at home, and class time is allocated for application and activities under the supervision of the teacher. (Bergman & Sames, 2014, P.123) defines it as “a method that relies on reversing the learning tasks between home and class, what students do in class they do at home, and what they do at home from homework they do in class.”

(Ray, 2014, P.212) indicates that the flipped classroom is based on the principles of the constructivist theory, where the learner is responsible for his own learning, and the flipped classroom links a new educational experience using educational videos with the learner's previous experiences, which helps to consolidate knowledge and understanding.

(Aladdin, 2015, P P. 94-99) mentioned the advantages of the flipped classroom, which are: keeping pace with the requirements and data of the digital age, flexibility, effectiveness, helping students who are academically stumbling, increasing interaction between the teacher and

students, focusing on higher levels of learning, helping students of all levels to excel. Especially those with special needs, transparency, overcoming the shortage of qualified teachers, as well as the absence of teachers.

Several studies have shown the importance of the flipped classroom in developing thinking for middle school students, such as the study (Jeremy, 2007) comparing regular and flipped classrooms. Where the researcher reached the importance of flipped classes in raising the level of critical thinking of students and the need for an adequate explanation of students' tasks within flipped and regular classes.

Scientific concepts are one of the most important aspects of science learning because of their importance in organizing experience, remembering knowledge, summarizing it in a meaningful form, following up on perceptions, linking them to their sources, and facilitating access to them. (Abdullah, 2011, P. 38).

And (Yaqoub,,2011,P. 40) defines it as: “a set of information that has relationships about a particular thing that is formed in the mind and includes the common and distinctive characteristics of that thing.”

(Nahed,,2003, P. 45) points out that scientific concepts are the basis for understanding science and its development, and imparting them to students is one of the goals of teaching science and scientific education, as it increases their ability to explain many natural phenomena, and helps them classify many things, events and situations. And grouped into categories to facilitate their study of the components of the environment.

In view of the importance of teaching and learning scientific concepts, many studies have focused on their development and acquisition of learners in different educational stages. These studies include the following:

The study of (Iman, 2007), the study of (Tawfiq,2008), the study of (Sanaa,2012) and the study of (Abdullah ,2014), where these studies aimed at developing scientific concepts as a dependent variable for the study sample by knowing the effect of one of the strategies or models or specific educational methods.

This confirms that the flipped classroom has an effective role in developing scientific concepts and imparting them to learners, due to the fact that the flipped classroom provides a safe, stress-free classroom environment dominated by an atmosphere of cooperation and competition among learners, which helps in acquiring scientific concepts.

The motivation to learn is a prerequisite for the success of the educational process, as it pushes the learner to achievement and achievement, and contributes to increasing the effort, energy, initiative and perseverance of the learner, and increases his ability to process information, which is reflected in his performance in the class, which leads to raising the level of his class interaction and educational achievement.

(Ahmed ,2006, P. 361) indicated that motivation is “a state of excitement or alertness within an organic organism that leads to a goal-seeking behavior, and this condition results from a need and works to move, activate and direct the behavior.”

(Magdy,,2007, P. 73): The importance of motivation is educationally manifested in that it is an effective means in achieving educational goals, as it represents one of the determinants of the learner's ability to achieve and achieve, because of its positive relationship with the learner's inclinations.

(Saleh, 2008, P . 117) stated that the importance of motivation stems from the following considerations:

- The subject of motivation is related to most of the topics of psychology, as it is closely related, for example, to perception, memory, thinking.
- Motivation is necessary to explain any behavior.
- All individuals of all ages and cultural and social levels are interested in the motivation to explain the nature of the relationships that bind them to others.
- The results of the study of(Reem,& Mona,,2016) the study of (Tahira, 2017) the study of(Ambo ,&Hoda, 2017) confirmed the effectiveness of the flipped classroom in developing motivation towards learning.

Research Objectives:

To know the current research on: Using the flipped classroom in science teaching to develop scientific concepts and motivation towards learning for first year preparatory students, and to clarify the extent of the link between developing scientific concepts and developing their learning motivation.

search variables

The current research included the following variables:

- The independent variable is represented in: Teaching the energy unit to first year middle school students after reformulating it and organizing the unit's content according to the flipped chapter using strategies (traditional flipped classroom teaching, problem-based teaching, strategy (think-pair-share)).
- The dependent variables are:
 - Developing some scientific concepts for first year preparatory students.
 - Development of motivation towards learning for first year preparatory students.

The two research groups:

The two research groups were chosen from the students of class (1/6) and it represents the experimental group, which is taught in the flipped class by the researcher, and the class (1/4) and it represents the control group that is taught in the usual way through another teacher for the first year preparatory school students. Preparatory school for girls in the Matai Educational Administration in the academic year 2021/2022.

Research tools:

The tools of the current research were as follows:

First: Teaching and learning tools and included:

- Student activity sheets: they include activities that are applied in the light of the flipped classroom.
- The teacher's guide to guide the teaching of the proposed unit in the light of the flipped classroom.
- An educational (CD) that includes (educational videos, presentations, and unit activities).

Second: The two measurement tools, which included:

- An objective test of the scientific concepts included in the unit of energy in order to measure the development of scientific concepts for first-year preparatory students at the Preparatory School for Girls in Matai, in the light of the CAPS levels. Cognitive (content knowledge, understanding and application, critical thinking and problem solving).
- Motivation towards learning scale to measure the following dimensions (participation with colleagues, self-efficacy, interest in school activities, and responsibility).

Research hypotheses:

- There is a statistically significant difference at the level 0. 05 between the mean scores of the members of the experimental group that studied using the inverted class and the scores of the members of the control group that were taught in the usual way in the post application of testing scientific concepts for the benefit of the experimental group.
- There is a statistically significant difference at the level 0. 05, between the mean scores of the members of the experimental group that studied using the inverse class and the scores of the members of the control group that were studied in the usual way in the post application of the learning motivation scale for the benefit of the experimental group.
- There is a significant correlation between the scores of the experimental group students in the post application

to test scientific concepts and the measure of motivation towards learning

Research Methodology:

The current research relied on the quasi-experimental approach based on the design of the experimental and control groups in the tribal and remote measurement of the research variables, which is looking at measuring the impact of the experimental variable, which is (teaching the energy unit after reformulating it and organizing the content according to the inverted chapter) on one or more dependent variables (the development of scientific concepts) and motivation towards learning).

Research results:

The current research concluded that the use of inverted separation has led to:

- Developing the scientific concepts included in the unit of energy among first-year preparatory students at the Preparatory School for Girls in the Matai Educational Administration.
- Developing some dimensions of motivation towards learning among first-year preparatory students at Preparatory School for Girls in the Matai Educational Administration.
- There is a significant correlation between the scores of the experimental group students in the post application to test scientific concepts and the measure of motivation towards learning.

Research recommendations:

The research recommends the following:

- Enriching the planners of educational programs and educational curricula with information about the impact of the flipped classroom entrance in developing scientific concepts and motivation towards learning in order to develop science curricula that are commensurate with the level of students and conform to the requirements of the times.
- Include topics related to classroom and extracurricular practices and educational applications for the flipped classroom in science curricula courses in the preparatory stage.
- Training science teachers on educational platforms and integrating them into the educational process and benefiting from them in applying the flipped classroom in science courses at different stages.
- Designing a guide for the science teacher in the preparatory stage that includes the strategies and activities of the flipped classroom and how to apply them during the lesson.
- Preparing workshops for students in the preparatory stage to develop their motivation towards learning and develop leadership qualities and the ability to take appropriate decisions and assume responsibility.
- Providing a positive atmosphere in the school and classrooms that helps the learners to develop their motivation towards learning.
- Providing electronic educational content for all courses by educational authorities that helps teachers to implement the flipped classroom

Suggested research:

The current research suggests conducting studies aimed at identifying:

- The effectiveness of a training program based on the flipped classroom in developing critical thinking and emotional intelligence among middle school students.
- The effectiveness of the flipped classroom on developing the skills of scientific thinking and the habits of mind among the preparatory stage students.
- The effect of using the flipped classroom on developing achievement and some problem-solving skills for middle school students
- The effect of using educational platforms in developing the conceptual comprehension and self-learning skills of preparatory stage students.
- The effectiveness of using the flipped classroom in developing the skills of reflective thinking and emotional intelligence among middle school students

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