



The Timing of Mathematics Lectures and Their Impact on the Level of Academic Achievement of Students

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Abstract:

The current research aimed to identify the timing of mathematics lectures and their impact on the level of academic achievement among students, and to achieve the goals of the research a semi-experimental design known as: (Design of the two experimental groups for one independent variable was used, the study community consisted of all university students in the first semester of the academic year 2019 / 2020 M. As for the study sample, it was intentionally chosen and a random appointment was made to be an experimental group and the other to be a control group, so that the number of students of the first experimental group was (24) students, and the number of students of the second experimental group (29) students, the study sample reached (53) students, and the results showed that there was a statistically significant difference at the level of 0.01 between the average grades of the first experimental group students who studied the morning mathematics lectures in the pre and post applications of the applied test in mathematics for the benefit of post-application, as the results demonstrated The presence of a statistically significant difference at the level of 0.01 between the average scores of students of the first two groups that were studied in the morning and the second that was studied in the evening in the post implementation of the achievement test in favor of the first group that was studied in the morning, and in light of those results the research presented a number of recommendations and results.

Key words: morning and evening lectures - teaching mathematics - mathematical achievement.



توقيت محاضرات مادة الرياضيات وتأثيرها على مستوى التحصيل الدراسي لدى الطلاب

الملخص:

استهدف البحث الحالي التعرف على توقيت محاضرات مادة الرياضيات وتأثيرها على مستوى التحصيل الدراسي لدى الطلاب، ولتحقيق أهداف البحث تم استخدام التصميم شبه التجريبي المعروف باسم: (تصميم المجموعتين التجريبتين للمتغير المستقل الواحد، تكون مجتمع الدراسة من جميع طلاب الجامعة في الفصل الدراسي الأول للعام الدراسي 2019/2020م. أما عينة الدراسة فقد تم اختيارها بشكل قصدي وتم التعين العشوائي لشعبة لتكون مجموعة تجريبية والشعبة الأخرى لتكون مجموعة ضابطة، بحيث كان عدد تلاميذ المجموعة التجريبية الأولى (24) طالباً، وعدد طلاب المجموعة التجريبية الثانية (29) طالباً، وبذلك بلغت عينة الدراسة (53) طالباً، وأثبتت النتائج وجود فرق ذي دلالة إحصائية عند مستوى 0,01 بين متوسطي درجات طلبة المجموعة التجريبية الأولى التي درست محاضرات مادة الرياضيات صباحاً في التطبيقين الفبلي والبعدي للاختبار التطبيقي في مادة الرياضيات لصالح التطبيق البعدى، كما أثبتت النتائج وجود فرق ذي دلالة إحصائية عند مستوى 0,01 بين متوسطي درجات طلاب المجموعتين الأولى التي درست صباحاً والثانية التي درست مساءً في التطبيق البعدى للاختبار التحصيلي لصالح المجموعة الأولى التي درست صباحاً، وفي ضوء تلك النتائج قدم البحث عدداً من التوصيات والنتائج.

الكلمات المفتاحية: المحاضرات الصباحية والمسائية، تدريس الرياضيات، التحصيل الرياضي.

Introduction:

Our current world is witnessing tremendous scientific and technological development. Scientific progress is one of the most important characteristics of this era, in which the rates of increasing knowledge have reached an unprecedented level. The magnitude of scientific discoveries has greatly increased and this makes the search for more appropriate methods to teach students how to think of one of the main tasks of education at all levels and for various stages. Students of all ages so that it works to raise the effectiveness of education and increase its feasibility and at the same time keep pace with the data of that ongoing revolution. This development imposed on the teachers the need to review their plans and methods of education so that they lead to the formation of a skilled person able to face the challenges of the era in ways that era.



Mathematics is one of the main areas of knowledge in highlighting scientific development. It has a leading position among the various branches of science and, of its multiple and varied applications. It can be said that the fields of application of contemporary mathematics broaden their horizons and increase in what realizes them real leadership in the fields of natural and social sciences , Business administration ,And other fields of application. Therefore, mathematics curricula and their educations must respond to the data of development and abandon its traditional robe. Students need more beneficial mathematics in their living paths, and their learning contributes to preparing them to face future challenges (Obaid, 1998, 3).

Therefore, it was necessary to adopt effective solutions that contribute to increasing the achievement of students at all educational levels, and this is confirmed and supported by Mina (2004, 49), as it indicates that one of the most important trends and future changes in the teaching and evaluation of mathematics in the Arab world is to give way to experimenting with some New trends in this field, with the influence of some methods and methods used in some directions is very useful.

Among the factors that may have the greatest impact in the development of the level of achievement in mathematics, (Al-Hebrew, 2012, 57) indicated that the time of learning is the most important component of the educational process, as it is the element through which the goals of the educational process can be achieved, as all The other elements are considered a hostage of him, as there is already a strong direct relationship between the time of learning and the achievement of goals. The higher the time of learning, the greater the knowledge outcome at all levels of the goals that have been achieved and gave the student a wide field towards expanding knowledge, information and abundant time.

Academic learning time is a good indicator of the progress of the educational process and one of the most important variables that can affect the learning process, where the study of (Pangrazi, 2007) indicated that effective teaching in education is the one in which students' downtime and waiting times during mathematics lessons decrease between early times. The evening timing, as well as the reduced time it takes for the teacher to complete routine administrative work.



In this sense, conducting a study to find out the most appropriate time to teach mathematics lectures to students at the university, which entails knowledge of the time spent by students in various learning activities; will contribute to identifying the extent of activating the lectures of mathematics positively.

Research problem:

The principle that determines the timing of mathematics lectures is the hour of the start of the lectures, and the morning time means the beginning of the lectures in the morning without the presence of lectures for other academic subjects before the mathematics lectures, and does this lead to students always being assimilated stronger in the early times in which no effort was defeated and thus its ability to absorb is Stronger, or evening timing at the end of the school day, which can be reflected in the ability of students in the affirmative as a result of focusing on the last tasks and activities that are exposed to them, and negative lead to boring and poor achievement?

The problem of low achievement in mathematics is one of the most important problems that hinder the educational process, and prevents it from performing its mission fully, and everyone who teaches can acknowledge the existence of this problem in almost every semester (whether lectures are in the morning or evening), where there are A group of students who are unable to keep up with the rest of the classmates in obtaining and assimilating the planned curriculum, and that group often turns into a source of riots and inconvenience, which may cause disruption in the educational process in the classroom or disruption of schooling in general within the school (Haredi 2003, 87).

When talking about the problem of poor achievement in mathematics and the weak level of education may come to our minds that the problem is local or limited to a specific country, but as Hammoudi (2009, 43) points out, one of the characteristics of the outcomes of the educational system in the Arab countries is the low achievement of its comprehensive level, and therefore is a problem The underachievement is one of the most common problems the educational system suffers in the Arab countries, as mentioned in the statistical report of UNICEF.



This is in addition to the waste of human energies and material capabilities, and he indicated that students after returning to the classroom do not achieve a good academic level, and that Ziab (2006, 42) pointed out that the problem of low school achievement is a global problem that is not nearly without a society.

From all this, the researcher developed a sense of the current study problem, which was represented in the low level of student achievement in mathematics, which may be due to the different timing of the lectures.

Research questions:

In light of the above, the main problem can be formulated for research in the following question: What is the effect of the timing of mathematics lectures on the academic achievement level of students?

Research hypotheses:

The current research attempts to test the validity of the following hypotheses:

1. There is no statistically significant difference at the significance level (0,05) between the average levels of pre and post measurements for the first group students who studied mathematics lectures in the morning on the cognitive achievement of mathematics.
2. There is no statistically significant difference at the significance level (0,05) between the average levels of pre and post measurements for the second group students who studied mathematics lectures in the evening on the cognitive achievement of mathematics.
3. There is no statistically significant difference at the level of significance (0,05) between the average scores of students of the first group who studied mathematics lectures in the morning and students of the second group studied mathematics lectures in the evening on the cognitive achievement of mathematics.

Research importance:

The current research can contribute to benefiting many groups concerned with the educational process as follows:



- Lecturers and faculty members: through:

- Using the most appropriate timing to teach mathematics lectures in order to improve students' level of achievement among students at the undergraduate and other levels.
- Developing the performance of faculty members through learning about ways to deal with problems related to students, the most important of which is the achievement of mathematics achievement.
- It may increase teachers' motivation and desire to develop their teaching performance by contributing to the achievement of many desired educational outcomes.

- Curriculum developers, education experts and university decision-makers: through:

- Training the faculty members in preparing tests to diagnose students' under achievement, and how to modify them.
- Directing the attention of the training and education personnel towards training faculty members to develop levels of achievement in mathematics among learners at various stages.

Search limits:

- 1- Undergraduate students, where the problem comes from.
- 2- The current research will be applied in the second semester to coincide with the study of the mathematics course.

Research community:

The research community consists of all undergraduate students who study the mathematics course, and a representative sample of the original community will be randomly selected, divided into two groups (first experimental and second experimental) as in experimental design.

Search tools:

This research includes the following tools:

- 1- Experimental treatment material tools, which include: Teaching through two different times, morning and evening, for mathematics lectures.
- 2- Measurement tools, which are represented in a cognitive achievement test for the unit (prepared by the researcher).



Search variables:

Independent variables: The current research included one independent variable: the timing of teaching mathematics lectures.

Dependent variables: The research also included a dependent variable, which is the development of achievement in mathematics among university students.

Research experimental design:

In light of the nature of the current research, the semi-experimental design known as: (Design of the two experimental groups for one independent variable is used as in the following table:

Table (1): Design of the two experimental groups for one independent variable

| Tribal measurement | Experimental treatment | The research sample | Telemetry |
|---|--|---------------------|---|
| – A cognitive achievement test in mathematics for university students | Teaching mathematics lectures in the morning | Experimental (A) | – A cognitive achievement test in mathematics for university students |
| | Teaching mathematics lectures in the evening | Experimental (B) | |

Statistical methods used in the current research:

- Paired - Samples t-Test.
- Independent-Samples t-Test.
- Eta squared (η^2) to see the effect size of the timing of mathematics lectures on the dependent variable.
- Arithmetic Averages.
- Standard Deviation.



Terminology of study:

Academic Achievement: Achievement in the Psychology Dictionary: It is defined as a specific level of achievement, competence and performance in school and academic work carried out by teachers or by mental tests (Glossary of Psychology, p. 5).

Academic achievement is also defined as the degree of acquisition achieved by the individual, or the level of success achieved or achieved by him in a study subject or educational field (Abu Allam, 2011, 305).

It is defined procedurally in the current research as the expected level of performance in mathematical skills, and it is measured by the degree that the student gets in the cognitive achievement test in the mathematics course for the university level.

The timing of mathematics lectures: The lecture means procedurally a summary of ideas or research in mathematics the lecturer gives to a group of students enrolled in the university, and the timing of presentation of the lectures either in the morning or evening according to the academic schedule.

Theoretical framework and previous studies:

The nature of mathematics:

Mathematics is considered one of the important and basic sciences that a student is exposed to in the different stages of his learning. It represent the place of the forefront between the different sciences throughout the ages from ancient times until the present time. An integrated structure, whose basic building blocks are the mathematical concepts on which algorithms, skills, and generalizations depend on their formation and acquisition. Mathematical concepts, algorithms, skills, and generalizations are an essential part of mathematics curricula for any of the stages and for any grade of classes, and it is one of the basics of mathematical knowledge (Sawalha, 2011, 2344).

Mathematics is also considered as a constructive science, and its issues are characterized by abstraction, and its meaning is gained through the mathematical system in which it is used, and it does not differ much from it as a study material, both of which are based on reasoning, except that school mathematics contains in its essence the basic concepts of mathematics, but after simplifying it To match the characteristics of the clients (Obaid, 2004, 36).

The elements of school mathematics content can be represented as follows (Syed, 2006, 38-41) in the following figure:

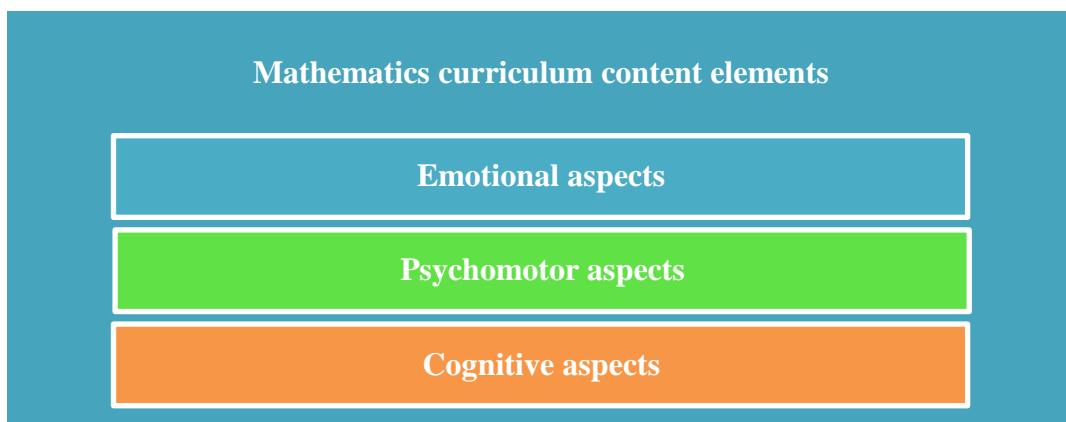


Figure (1) elements of mathematics curriculum content

Below we will briefly address each of these aspects (Obaid, 2004, 23; Syed, 2006, 38-41):

A- Mathematical knowledge aspects: Mathematical knowledge aspects are as follows:

- Mathematical concepts: the concept in general is the abstraction or mental image of the properties common to a group of things. Mathematical concepts can be classified according to different bases.
- Mathematical Relationships: These are mathematical sentences (reports) that link two or more concepts, for example Muslim women, theories, laws, principles, etc.
- Mathematical applications: Mathematical applications in a textbook represent examples, activities, exercises, exercises, and issues. Any mathematical application includes one or more mathematical skills. Mathematical skills are procedures that include mathematical material itself, as well as mathematical methods and algorithms that depend on mental processes at different levels. Examples of mathematical skills include:
 - Translating the verbal formulation of a problem into a mathematical form.
 - Give examples and no examples of a mathematical concept.
 - Find a rectangular area with dimensional information.
 - Find a rectangular area, knowing the ratio between the two dimensions and surrounding.



- Perform specific algebraic or algebraic operations.
- Draw an approximate form of a function of a certain degree.
- Deriving a new mathematical result from a given or from a given hypothesis, from a previous result, or from linking two previous results in a sports sequence or ... etc.

B- Psychological aspects of movement in school mathematics:

These aspects are represented in the skills that require the use and consistency of the muscles of the human skeleton, and they are very limited in the field of school mathematics, and the intention of dealing with them is often cognitive or emotional, and examples include the following:

- Draw specific geometric shapes (straight - beam - straight segment with a certain length - angle with a certain measure - a circle with a radius of some - a polygon with specific measurements ... etc.).
- Conducting engineering constructions under certain conditions (angular alignment or straight segment - drawing a column on a straight line - drawing geometric figures that achieve a specific property or properties using engineering tools)
- Using the calculator or computer to perform certain mathematical operations ... etc.

C- Emotional aspects of school mathematics:

These aspects are related to the feelings, feelings and emotions of a person. Among the most important elements are inclinations, attitudes, dispositions, values ... etc., and these aspects are not explicitly found in the textbook, yet its existence can be inferred in the content of school mathematics, as it may lead to the formation and development of positive attitudes towards Studying mathematics for students includes the textbook for the following:

- References on historical and cultural aspects in the introduction to the textbook or in the context of a specific topic, allowing to identify important points of transformation or change in mathematics.
- Hints about the functionality of mathematics and its importance in the student's practical life.
- Sufficient and interesting examples and training for students' interests and scientific curiosity.



- Mathematical applications related to the lifestyle situations of the learner or to other areas of knowledge that arouse his curiosity and interest
- Tools to link mathematics branches, book readability, content organization ... etc.

General objectives for teaching mathematics:

Admittedly, the aims of mathematics education (like any other subject), include three main areas:

- Cognitive Domain: It includes the goals that are concerned with developing thinking and mental processes at different levels.
- Psycho - motor Domain: Includes work-related goals and practical skills included in the study of mathematics.
- Affective Domain: It includes the goals that are concerned with the emotional aspects of the learner, such as: the positive attitude towards the subject of the study, its acceptance of it and a sense of value and importance of what it learns in it.

Al-Subhi (2012) refers to a set of general goals for teaching mathematics, including:

- Interpretation of natural phenomena and knowledge of the potential of the environment and society.
- Using mathematical methods in researching, interpreting, and taking decisions related to mathematical and human aspects.
- To employ mathematics efficiently to form an enlightened citizen in the productive and consuming aspects
- Use the language of mathematics to express one and communicate with others.
- Benefiting from mathematics to know the extent of its contribution to life as a science, art and culture.
- Realizing the role of mathematics in scientific progress and other subjects.
- Development of methods of thinking and problem solving.



And since the goals of teaching mathematics are multiple, complex, and overlapping, so it is difficult to separate them conclusively, it was necessary for the sake of simplicity and study to classify these goals as a classification that helps in selecting the content of the curricula, teaching strategies and methods of evaluation, but that the goals must be integrated.

In order for students to achieve desired learning outcomes, the mathematics curricula in Oman have been developed to become centered on a set of general goals; they can be summarized as follows:

- The vocabulary of mathematics is defined by symbols, terms, forms and others.
- Using mathematics to communicate and communicate.
- Linking mathematical ideas and concepts with other mathematical ideas and concepts, daily experiences, and other subjects.
- The use of appreciation and mental arithmetic in daily life.
- Linking mathematical knowledge to each other and using it to solve problems.
- Interpreting results and expressing ideas in a logical manner.
- Use and employ the appropriate technology to process data and facilitate mathematical operations in problem solving.
- Using mathematical thought efficiently to benefit from it in the productive and consumer aspects.
- Understand the role of mathematics in scientific progress and appreciate the role of Arab and Muslim scholars and others in this field.
- Using mathematical knowledge in understanding economic and social activities.
- And manifestations of civilization and development locally, regionally and globally.
- Development and positive attitudes towards mathematics (Ministry of Education, 2011).

Mathematical achievement:

Achievement is one of the important topics that occupied and still occupies the thinking of specialists in curricula and teaching methods, as it is one of the basic manifestations of the required mental activity, and since learning embodies an invisible psychological process that occurs as a result of changes in the cognitive structure of learners we often tend to know its existence through achievement, Achievement is a product of learning and its perceived face.



It is also the direct material that we deal with during various assessments to determine the adequacy of this learning or a value for learners. Here, Abu Hatab and others (2003, 512) indicate that academic achievement is one of the most important educational topics, One of the most important phenomena that occupy specialists based on the educational process, and this is due to the importance it has in the lives of learners, and those around them who are parents and teachers, because academic achievement reflects the level of mental activity of the student, because it is the first thing that draws attention to assess the status of the student, and determine its path Educational, and even define the stages of his entire life, and guide him in the direction in which he can succeed, and thus academic achievement plays an important role in shaping and defining the learning process.

Achievement is the degree of cognitive development achieved by the student in a specific aspect of learning related to the academic program, and that poor achievement in the academic subjects is an educational and psychological problem that has negative effects, such as feeling frustrated and weakening the motivation towards education and forming negative attitudes towards studying educational materials, and research has confirmed The existence of a functional relationship between good achievement and positive attitudes towards school and also reflects on the behavior of learners towards school and education and contributes to modifying psychological and social compatibility for them, and this in turn affects direct growth on human wealth, which it is hoped to exclude T to the maximum extent possible in the fast evolving world (Kubaisi, and Hayani 2004, 136).

Academic achievement is defined as the degree of acquisition achieved by the individual, or the level of success achieved or attained by him in a study subject or educational field (Abu Allam, 2011, 305).

Achievement is directly related to students 'academic performance to clarify the extent to which students' educational goals have been achieved, and are measured by achievement tests, which are tools for measuring an individual's achievement of a particular knowledge or skill gained as a result of education or training (Al-Turiri, 2012, 280-281).

The achievement tests measure the extent to which students understand some of the knowledge, concepts and skills related to the subject matter, as academic achievement indicates the current state of individual performance or learning or what he has already gained in an educational program (Abu Alam, 2011, 305-306).



On the level of mathematics education, the researcher believes that achievement is an important way to ensure students' progress toward teaching goals, as the teaching objectives in mathematics are based on the teaching of mathematics mainly. The academic achievement in the current research is the degree of the student's score in the achievement test, which results from the student's acquisition of mathematical knowledge and experience in mathematics.

Types of poor academic achievement:

Weak educational attainment is categorized into types (Al-Ghawi, 2011, 29):

- The focus on the diagnostic aspect should be significant in the foundation stage in particular. There is a need to continue to emphasize it in later education.
- Weak general academic achievement: which is in all subjects and is related to low intelligence, where the IQ ranges between (71-85).
- Weak private academic achievement: It is only in a specific school subject, such as the account, for example, and it is linked to a lack of a specific ability or skill.
- Poor academic achievement, as the student's achievement is less than his ability over a period of time.
- Weak attitudinal academic achievement: It is related to specific situations where the student's achievement is less than his ability due to bad experiences such as transfer from one school to another, family problems or the death of a relative.
- Real academic retardation: It is associated with a lack of intelligence and abilities.

Academic achievement problems:

The problem of underachievement is one of the most important problems that hinder the educational process, and prevents it from performing its mission fully, and everyone who practiced teaching can acknowledge the existence of this problem in almost every semester, where there is a group of students who are unable to keep up with the rest of the colleagues in achieving The curriculum is determined and assimilated, and this group often turns into a source of riots and inconvenience, which may cause disturbance of the educational process in the classroom or disruption of study in general within the school (Huridy, 2003, 87).



When talking about the problem of poor achievement and the weak level of education may come to our minds that the problem is local or limited to a specific country, but as Hammoudi (2009, 43) points out, one of the characteristics of the educational system outcomes in the Arab countries is the low achievement at its comprehensive level, and therefore the problem of low achievement is One of the problems that the educational system suffers from in the Arab countries, as mentioned in the statistical report of UNICEF, is this in addition to wasting human energies and material capabilities, and he indicated that the students after they return to the classroom do not achieve a good academic level, and Dhiab (2006, 42) indicates that the problem of low academic achievement is not a global problem almost devoid of such a society.

Here it should be noted that (Nist & Holschuh, 2011, 92) indicated that academic achievement is influenced by the individual's ability to process the information provided and the processing and processing of that information is related to cognitive mental processes affecting each of the stages of the acquisition, retention and retrieval of information, which includes attention, awareness , Memory, Imagination, Thinking, and Decision-making, as there are stages that the submitted information processing system goes through that affect the immediate and delayed academic achievement, and here review strategies are one of the main factors affecting information processing, especially with regard to financial processes, Linked to memory and cognition.

Achievement level diagnosis methods:

The teacher can use a variety of diagnostic methods such as (El Ghawi, 2011, 30):

- The application of a standardized test of intelligence in order to obtain the achievement level or the achievement age and thus determine the degree of academic delay.
- The use of standardized achievement tests in the absence of an IQ test scale.
- Note the student's performance and interaction in the classroom.
- Direct interview with the student and parents' contact.
- Student performance reports in previous years.
- Academic or prospective files for the student.
- The opinion of teachers, psychologists and social workers, as well as parents and school reports.



It is clear from the above that the academic achievement is one of the most important goals of the educational process with all its elements and it is also one of the criteria for evaluating it, which made his study the focus of great interest from researchers and educational students, and that the achievement test is one of the measurement tools that provides information about the extent of the individual's acquisition of cognitive experiences with their various levels and skills That have been studied.

Among the studies that concerned with developing achievement in mathematics in the Kingdom of Saudi Arabia is the Asiri study (2016), which aimed to identify the impact of teaching mathematics using the self-scheduling strategy in the achievement of fifth-grade primary students in Khamis Mushayt schools, and to achieve this research, the researcher used the semi-experimental approach, The research sample consisted of (44) fifth-grade primary students, they were divided into two control and experimental groups, each of which contains (22) students. The research tools consisted of a cognitive achievement test, the research tools were applied before the teaching and then the teaching of the experimental group using the self-scheduling strategy and the control group in the usual way for a period of four weeks, then the research tool was applied dimensional, and the results of the research reached a statistically significant difference at a level ($\alpha^3 05.0$) , Between the mean scores of students of the experimental and control groups in the post-application of the cognitive achievement test for the benefit of the students of the experimental group. The results of the research also demonstrated the great positive impact of the self-schedule strategy on achievement among the experimental group students.

And Adam's study (2014), which aimed to determine the effectiveness of a training unit in mind habits in developing mathematical achievement, creative thinking and the trend towards habits of the mind and towards mathematics among university students and used the experimental approach with two experimental and control groups, and the content of the course of mathematics principles was determined and the foundations of building the unit of mind habits He prepared a training manual for the unit of mind habits, an achievement test in the unit for mind habits, an achievement test in the course of mathematics principles, a scale of attitudes toward habits of the mind, a scale of attitudes toward mathematics and the use of a test of creative thinking skills for the world of Torrance, and trained pain.



The experimental group on the use of mind habits during their study of the math principles course while the control group studied the decision in the usual way and the results of the research proved that training students to use mind habits while learning the math principles course had an effect and effectiveness in developing the level of achievement in mathematics and the positive direction towards it, as well as an impact in The development of creative thinking as a whole and at the level of each sub-skill. The research recommended establishing the habits of the mind in the school mathematics curricula and including the goals of developing the habits of the mind within the goals of school mathematics education in all educational stages and the development of generating mathematics curricula Quantitatively and qualitatively by including various activities and situations that increase the chances of forming habits of mind among students.

And Al-Barakati study (2014), which aimed to identify the effect of using a training program based on effective teaching in developing achievement and decision-making skills among students of mathematics teaching methods at Umm Al-Qura University, and to achieve the goals of the research, the researcher used the experimental approach and semi-experimental design with pre and post tests; also applied The researcher has a study consisting of (52 female students) divided into two groups, one is experimental, and the number of female students is (26) female students; the other is a control and the number of female students is (26) female students, the tools were applied before and afterward, and the researcher used the test (accompanying contrast analysis) as a method Statistic To analyze the study data, the study reached a number of results, the most important of which is the presence of a positive effect of using a training program based on effective teaching in the development of achievement among students of mathematics teaching methods at Umm Al-Qura University, as well as a positive impact of using a training program based on effective teaching in developing taking skills The decision among students of mathematics teaching methods at Umm Al-Qura University.

The Lang Erick study (2012): The aim of this research is to find out the relationship between preparing a student at the secondary level in mathematics and joining the courses of developmental mathematics after the research to prepare it for the community labor market.



The research was conducted in Washington and the sample contained 16 public schools, an average of 33% From government schools in the secondary stage in 2009 and the number of students reached 2821 as they were subjected to the courses of developmental mathematics entry in (2009-2010), and their achievement in mathematics was followed after the completion of these courses to 2012, and the results indicated the high level of achievement of these students in mathematics, It also indicated the high potential Prediction of creativity among these students at the entrance of programs of development tools of mathematics, and recommended that the study of developmental students of mathematics is important to meet the student's labor market societal.

And the Chung study (2004), which aimed to compare the achievement of the third grade students in the matter of hitting in public schools in St. Louis, Missouri, in America who studied according to the structural and regular curves. The study sample consisted of 71 male and female students, divided into four divisions that were divided To two experimental groups (constructive) 36 male and female students and the other (traditional) control group comprising 35 male and female students, the researcher used three tests in mathematics Stanford test to diagnose basic mathematics and two tests prepared by the researcher on the subject of multiplication consisting of 10 open-ended questions and show the absence of significant differences A statistic attributable to the teaching method in understanding multiplication skills.

Search procedures:

First: Methodology:

The current research followed the experimental approach with its semi-experimental design, and the semi-experimental designs are defined as partly a real experimental in which some sources that threaten internal honesty are not controlled, and not all of them. Therefore, these designs are used in cases where we find it very difficult to provide complete experimental control. The research used in this study one of the semi-experimental designs, which is the design of asymmetric groups, based on two groups (morning time for teaching mathematics lectures (MG A) - evening timing for teaching (MG B) with two tests (pre-post), to find out the effect of the independent variable (The difference in the timing of teaching mathematics lectures) on the dependent variable (academic achievement in mathematics).



As the two groups were not selected so that they are equivalent, they are often from existing groupings such as classroom people. Then one of the groups was randomly assigned as group A and the other (B) After the experiment is completed, the test will be applied Direct and deferred Yale to detect differences in the performance of the two groups.

Second: The study community and its sample:

The study population consisted of all university students in the first semester of the 2019/2020 academic year. As for the study sample, it was intentionally chosen, and the random appointment of a division to be an experimental group and the other division to be a control group, so that the number of students of the first experimental group was (24) students, and the number of students of the second experimental group (29) students, thus the study sample reached (53) Asking.

Third: Study tools:

Achievement test:

Structure of the test: In light of the specification table prepared by the researcher, and based on the analysis of the units of mathematics course, the post-test achievement was prepared by the researcher, by following the following steps:

1. A set of questions that achieve and measure study objectives were identified from the book's scheduled questions, additional questions, and review in the unit under study, as well as from previous years' questions for teachers with experience in teaching mathematics.
2. In consultation with experienced teachers, the best (10) questions were chosen from this group, in proportion to the subject of the study, for the measurement tool to match the study goals and measure what was designed to measure it.
3. The necessary adjustments were made to him, verifying his sincerity, and calculating his stability factor, until it was finalized,
4. The model answer is developed using strategies that each question can be solved.



Verification and reliability of the achievement test:

After preparing the academic achievement test and building its paragraphs, which are in its initial form of (14) questions, the test was presented in its initial form to a group of arbitrators from professors of curricula and math teaching methods, and a letter was sent to the arbitrators explaining the problem, goals, questions, and assumptions of the study, and the number reached Arbitrators (11) arbitrators, in order to ascertain the degree of suitability of the question, its clarity, its affiliation with what it measures, and the integrity of the linguistic wording, as well as looking at the degrees of correction and its suitability. And based on the opinions of the arbitrators on the extent of the test suitability of the study goals, and according to their guidance and proposals, the wording of some questions was modified linguistically, adding and deleting some of them to make the number of questions in the test (12) questions, and the final mark of (24) degrees.

The content has been verified and presented to the arbitrators and the following questions have been asked:

Are the questions clearly articulated? Does the vocabulary measure the goals for which it was set? What is the relevance of the test to the goals of the current study? What is the relevance of the test level to the level of the university students of the current research sample? And whether they have edits delete or add.

After making some adjustments to the test according to the guidance of the arbitrators that were in the wording and language, the test was finalized, and the answer key sheet on which the test correction was based was placed.

Reliability test:

After preparing and judging the test, it was applied to a survey sample consisting of (20) students who were not members of the study sample who had previously studied the unit. It reached (87.0), which is a statistically acceptable value for the purposes of the study, and it is also an appropriate value that allows the use of the test as a tool to measure student achievement, and then obtain reliable results. The difficulty and discrimination factors for the test were calculated and were between (20.0 - 81.0) and (32.0 - 84.0), respectively.



Study variables:

1- The independent variable: It is the timing of mathematics lectures and has two levels: (morning - evening)

2- The dependent variables: which are the achievement in mathematics?

Statistical processing:

To answer the study questions, pre and dimensional standard deviations and deviations were used for the two experimental groups and the control group, and the ANCOVA co-analysis was used.

The results and discussion of the study:

The current study aimed to investigate the effect of the different timing of mathematics lectures and their impact on the level of academic achievement of students. The following is a presentation of the results:

First: Results related to answering the first question of the study question, which is: "Is there a statistically significant difference at the level of significance (0.05) between the average levels of pre and post measurements for the first group students who studied mathematics lectures in the morning on the cognitive achievement of mathematics?"

To answer this question, mathematical averages and standard deviations were extracted from the first experimental group that studied mathematics lectures in the morning on the pre and posttest and the table (2) illustrates this.

Table (2): Arithmetic averages and standard deviations for the first experimental group scores that taught mathematics lectures in the morning on the pre and post math test using the direct teaching method.

| Effect size | d | n2 | Significance | T | Standard deviation | The average | Application | The test |
|-------------|------|------|--------------|-------|--------------------|-------------|-------------|----------------|
| High | 4,58 | 0.84 | 0.01 | 16,45 | 0.58 | 0.42 | Tribal | Remember |
| | | | | | 0,99 | 4,29 | after | |
| High | 2,45 | 0.6 | 0.01 | 8,74 | 0,86 | 1,29 | Tribal | Understanding |
| | | | | | 0.78 | 3,42 | after | |
| High | 5,69 | 0,89 | 0.01 | 20,77 | 0.95 | 0,88 | Tribal | Implementation |
| | | | | | 2,97 | 12,33 | after | |
| High | 6,36 | 0.91 | 0.01 | 22,25 | 1,21 | 2,58 | Tribal | Total score |
| | | | | | 4,03 | 20,04 | after | |

From the table (2) it is clear that there is a statistically significant difference at the level of 0.01 between the average scores of the first experimental group students who studied the morning mathematics lectures in the pre and post applications of the applied test in mathematics in favor of the post application, in the test as a whole and in the sub dimensions of the test Remember, understand, the application "where the calculated value of" T "for the test as a whole was" 22, 25 "and for the sub-dimensions composed respectively ,8,74 ,16,45 " " 20,77".

Second : Results for the answer to the question the second of the questions of the study which is " : Is there a difference D statistically at the level of significance (0.05) between the middle grades two measurements of tribal and post students Group II , which studied the lectures of mathematics evening on the achievement of knowledge of the substance of mathematics? .

To answer this question, mathematical averages and standard deviations were extracted for the second experimental group that studied mathematics lectures in the evening on the pre and post test and the table (3) shows that.

Table (3): Averages and standard deviations for the second experimental group that studied mathematics lectures in the evening on the pre and post test

| Effect size | d | n2 | Significance | T value | Standard deviation | The average | Application | the test |
|-------------|----------|----------|--------------|---------|--------------------|-------------|-------------|----------------|
| High | 1,1 2 | 0.2 3 | 0.01 | 3,99 | 0.47 | 1.54 | Tribal | remember |
| | | | | | 1.5 | 2,97 | after | |
| High | 1.4 | 0.3 3 | 0.01 | 4,98 | 1.21 | 0.54 | Tribal | Understanding |
| | | | | | 1,07 | 2,17 | after | |
| High | 0.9 7 | 0,1 9 | 0.01 | 3,49 | 0.84 | 3.21 | Tribal | Implementation |
| | | | | | 3,27 | 8,66 | after | |
| High | 1,2 8 | 0.2 9 | 0.01 | 4,54 | 2.51 | 5.29 | Tribal | Total score |
| | | | | | 5,33 | 13,79 | after me | |

It is clear from the table (3) that there is a statistically significant difference at the level of 0.01 between the average scores of students of the second experimental group that studied the evening mathematics lectures in the pre and post applications of the applied test in mathematics in favor of the post application, in the test as a whole and in the sub-dimensions that make up the test "Remember, understanding, application" as the value of "T" calculated for the test as a whole " 4.54 " and the dimensions of the sub - components respectively 3.49 - 4.98 - 3.99

First, the results related to answer the first question of the study questions which is :

"Is there a difference D statistically at the level of significance (0.05) between the middle grades students group first that studied the lectures of mathematics in the morning and students group II studied the lectures of mathematics evening on the achievement of knowledge of the material mathematics ?

To answer this question, the mean and standard deviations of the two experimental groups (morning and evening (were extracted on the post test and the table (4) shows that.

Table (4): The significance of the difference between the mean scores of students of the two groups in the post-application of the achievement test as a whole and in its sub-dimensions

| Effect size | d | μ_2 | Significance | T | P | M | N | the group | The test |
|-------------|------|---------|--------------|------|-------------|--------------|-----------|-------------------------|----------------|
| High | 1,03 | 0.21 | 0.01 | 3,7 | 0,99 | 4,29 | 24 | The first group | remember |
| | | | | | 1.5 | 2,97 | 29 | The second group | |
| High | 1,34 | 0.31 | 0.01 | 4.75 | 0.78 | 3,42 | 24 | The first group | Understanding |
| | | | | | 1,07 | 2,17 | 29 | The second group | |
| High | 1,19 | 0.26 | 0.01 | 4,25 | 2,97 | 12,33 | 24 | The first group | Implementation |
| | | | | | 3,27 | 8,66 | 29 | The second group | |
| High | 1,34 | 0.31 | 0.01 | 4,73 | 4,03 | 20,04 | 24 | The first group | Total score |
| | | | | | 5,33 | 13,79 | 29 | The second group | |

It is clear from the previous table that there is a statistically significant difference at the level of 0.01 between the average scores of students of the first two groups that studied in the morning and the second that was studied in the evening in the post-application of the achievement test in favor of the first group that studied in the morning ,in the test as a whole and in the sub-dimensions that make up the test. Understanding - applying "where the" T "values for the test as a whole were" 4,73 "and for the sub-dimensions respectively" 3,7,4,75,4,25" ".

In order to complete the picture with regard to the effectiveness of the different recommendations of mathematics lectures in developing academic achievement, the researcher calculated the effect size as the concept of the effect size came to complement the concept of the statistical significance of the results.



The concept of the statistical significance of the results focuses on the extent of confidence that we place in the results regardless of the size of the difference or the size of the correlation, while the concept of the size of the impact focuses on the difference or the size of the correlation regardless of the extent of confidence That we put in the results (Mansour, 1997, p. 59.)

It is clear from the results of the previous table that there is a large impact size for the timing of mathematics teaching lectures in the development of academic achievement and the sub-dimensions that make up the test, where the values of d In the order "1, 34, 1, 03, 1, 34, 1, 19", which are values greater than 0, 8; this indicates a strong impact of the timing of teaching mathematics lectures on academic achievement and the sub-dimensions that make up the test.

The researcher attributes this to several reasons, the most important of which are:

The teaching of lectures in the morning students contribute to increasing the ability of the student to keep what he done lecturer of explanations without details has :

- Teaching the morning lectures helps in expanding the learner's experiences and facilitating building concepts ,provoking the interest of the learner and satisfying his need for learning because the lecturer did not receive other administrative and teaching burdens, which contributes to presenting the material in exciting ,interesting and attractive methods ,which achieves the desired fun and diversity in the learning situations for the student.
- Away morning classes factor monotony and boredom for students and forcing them to engage in the activities of the lecture.



Recommendations:

After presenting the results of this study and discussing it according to the study questions and their compatibility with the results of previous studies, these results indicated the effectiveness of morning teaching of mathematics lectures in improving achievement in mathematics among students and the researcher believes that he provides the following recommendations:

- Conducting more studies on the real problems facing students to achieve the required academic skills.
- Advocating for generalizing morning teaching of mathematics lectures as a teaching timing for university students.
- The morning timing of teaching has an important role in motivating learners and stimulating them in the learning process by relying on the positivity and activity of the lecturer, which facilitates the participation of each learner in the educational learning process and its regular functioning.
- Conducting more studies on the effectiveness of optimal timing in other educational stages and other subjects.

References

- Abu Allam, Mahmoud (2011). "Measurement and Evaluation of Academic Achievement", Third Edition, Dar Al-Qalam Press. Safat, Kuwait.
- Abu Allam, Salah Mahmoud. (2011). "Measurement and evaluation of academic achievement, third edition," Dar Al-Qalam Press. Safat, Kuwait.
- Abu Hatab, Fouad and Sayed Othman, Amal Sadie. (2003) Psychological Calendar, 10th edition, The Anglo-Egyptian Library. Cairo.
- Adam, Mervat Muhammad Kamal Muhammad (2014). "The effectiveness of a training unit in Habits of Mind in developing mathematical achievement, creative thinking, and its direction and towards mathematics among university students." Arab Studies in Education and Psychology - Saudi Arabia No. 48, Part 2: 100 - 162.



- Al-Barakati, Nevin Bint Hamza Bin Sharaf (2014). "The effect of using a training program based on effective teaching in developing achievement and decision-making skills among students of mathematics teaching methods at Umm Al-Qura University." The Journal of Mathematics Education – Egypt. Vol 17, No. 1: 92 - 154.
- Al-Ghawi, Ahmed (2011). Mechanisms and foundations for the diagnosis and measurement of academic achievement. Education Mission: Ministry of Education G 34: 26-37.
- Al-Ibri, Saleh bin Saeed bin Hamad (2012). "Learning time and its relationship to the quality of academic achievement." Educational Development Magazine: Ministry of Education Q10, p 68: 56-60.
- Al-Kubaisi, Abdul Wahid, Al-Hayani Bardan. (2004). "Diagnosis of some psychological and behavioral phenomena by the achievement of preparatory stage students in mathematics", Journal of Humanities and Economic Sciences, No. 5, December, Anbar University, Iraq.
- Al-Turiri, Abdul Rahman. (2012). The concern of the test for university students and its relationship to some variables, second edition, Journal of the Faculty of Arts, Alexandria University, Egypt
- Asiri, Abdullah Ali Abdullah Al-Awad. (2016). "The effect of teaching mathematics using the self-schedule strategy on the achievement of fifth primary school students in Khamis Mushayt Schools". Culture and Development - Egypt Q16, 104: 328-380.
- Chung, I. (2004). "A comparative assessment of constructivist and traditionalist approaches to establishing mathematical connections in learning multiplication education". Dissertation abstract International.
- Dhiyab, Youssef. (2006). The Psychology of Scholastic Delay: A Curative Analytical View, Curriculum House.
- Hammoudi, Ahmed. (2009). Non-school social variables associated with both academic achievement and social exclusion: a critical psychology study, Journal of Humanities, p. 41.
- Haredi, Adel Mohamed (2003). Individual differences in emotional intelligence in the light of vital / social variables. Journal of Arab Studies in Psychology - Egypt, Vol. 2, No. 2: 57-108.
- Kafafi, Aladdin Jaber (1990), "A Dictionary of Psychology and Psychiatry". Volume II .Dar Al Nahda Al Arabiya, Cairo.



- Lang, Erick. (2012). The Relationship of High School Preparation in Mathematics to the Enrollment of College Freshman in Postsecondary Developmental Mathematics Courses, Doctoral Dissertations, Maryland, Retrieved from: <https://eric.ed.gov/?id=ED547549>
- Mansour, Roshdy Fam. (1997). The magnitude of the face effect, complementary to statistical significance, Egyptian Journal of Psychological Studies, 7 (16), 57-75.
- Mina, Fayed (2006). Issues in teaching and learning mathematics. I 1, Cairo: The Anglo Egyptian Library, Egypt.
- Ministry of Education. (2011) Mathematics curriculum document. Saudi Arabia: General Directorate for Curriculum Development.
- Nist,S. L., & Holschuh, J. L. (2011). Comprehension strategies at the college level. In R F. Flippo, & D. C. Caverly (Eds.), Handbook of college reading and study strategy research (pp. 75-104). Mahwah, NJ: Lawerence Erlbaum Associates
- Obaid, William Tawadros. (2004). Teaching mathematics to all children in light of the requirements of standards and a culture of thinking, Amman, Dar Al Masirah for Publishing and Distribution.
- Obaid, William. (1998). "Teaching and learning mathematics at the primary level." Al Falah Library, Kuwait.
- Pangrazi, R. P. (2007). Dynamic Physical Education for Elementary School Children. 15th Edn., Benjamin Cummings, San Francisco, CA.
- Sawalha, Aouni Ata Al-Sheikh. (2011). "Common mistakes in mathematics are its patterns and methods of treatment for students with learning difficulties in mathematics." Studies - Educational Sciences: University of Jordan - Deanship of Scientific Research, Vol. 38, Supplement (2011): 2344-2365.
- Syed, Ahmed Mohamed. (2006). Evaluation of fifth grade mathematics books in the light of standards and culture philosophy, studies in curricula and teaching methods, the Egyptian Association for Curricula and Teaching Methods, Faculty of Education, Ain Shams University, No. 113. April 2006