Jordan Journal of Educational Sciences, Vol. 20, No. 4, pp. 835-847

The Effect of Using Programmed Instruction on Sixth-Grade Students' Achievement in Arabic language and Their Attitudes Towards It

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Received: 12/6/2023
Accepted: 29/4/2024
Published: 31/12/2024

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Citation: Alslaiti, F. M., Al-Hirsh, S. M., Al-Issa, R. M., & Al-Masaeid, A. L. (2024). The effect of using programmed instruction on sixth-grade students' achievement in Arabic language and their attitudes towards it. Jordan Journal of Education, 20(4), 835–847. https://doi.org/10.47015/20.4.13

Abstract

Objectives: This study aimed to determine the effect of using programmed instruction on sixth-grade students' achievement in the Arabic language and their attitudes towards it in Jordan. **Methodology:** To achieve the study objectives, an achievement test with 25 items and a scale of attitudes towards Arabic with 39 phrases was prepared. Two teaching units from the sixth-grade Arabic language textbook were developed. In the first semester of the academic year 2022/2023, a sample of 66 sixth-graders from Irbid Directorate of Education was selected. The sample members were chosen purposefully, and they were split into two groups: a control group, which consisted of 33 students who studied using the conventional approach, and an experimental group, which consisted of 33 students who studied using programmed instruction. **Results:** According to the study's findings, there were statistically significant differences between the average student scores on the post-achievement test attributed to the teaching method, in favor of the experimental group, as well as between the average student scores on the attitude scale attributed to the teaching method, also in favor of the experimental group. **Conclusion:** In light of these results, the study suggests implementing such Arabic language programmed instruction at all educational levels, starting with the lower levels and upper elementary stages, and incorporating them into instructional plans.

Keywords: Programmed instruction; achievement; attitudes; Arabic language; sixth-grade students.

أثر استخدام التعليم المبرمج على تحصيل طلبة الصف السادس في اللغة العربية واتجاهاتهم نحوه

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الملخص

الأهداف: هدفت الدراسة إلى الكشف عن أثر استخدام التعليم المبرمج على تحصيل طلبة الصف السادس في اللغة العربية واتجاهاتهم نحوه. **المنهجية:** لتحقيق أهداف الدراسة، تم تطبيق اختبار تحصيلي مكون من 25 فقرة، مقياس اتجاهات من 39 عبارة، وتم اختيار وحدتين تدريسيتين من كتاب اللغة العربية للصف السادس. كما تم اختيار عينة مكونة من 66 من طلبة الصف السادس من مدارس تربية إربد في الفصل الدراسي الأول من العام الدراسي 2023/2022، ثم تم تقسيم أفراد العينة إلى مجموعتين. كانت المجموعة الأولى ضابطةً وتتكون من 33 من الطلبة درسوا باستخدام الطريقة التقليدية ومجموعة أخرى تجريبية مكونة من 33 من الطلبة درسوا باستخدام التعليم المبرمج.

النتائج: أظهرت نتائج الدراسة وجود فروق ذات دلالة إحصائية بين معدل تحصيل الطلبة على اختبار التحصيل البعدي تعزى إلى طريقة التدريس ولصالح المجموعة التجريبية. وكذلك وجدت فروق ذات دلالة إحصائية بين معدل الطلبة على مقياس الاتجاه تعزى إلى طريقة التدريس ولصالح المجموعة التجريبية. **الخلاصة:** تقترح الدراسة تطبيق التعليم المبرمج في تعليم اللغة العربية في المراحل الدراسية المختلفة ودمجها بخطط التعليم.

الكلمات المفتاحية: التعليم المبرمج، التحصيل، الاتجاهات، اللغة العربية، طلبة الصف السادس.

Introduction

Education has encountered a number of changes due to the incredible advances made in the field of information and communication technology, which have caused national borders to vanish and led the world into scientific and economic openness. These changes in education have been reflected in the scientific, technological, and knowledge revolution. Since the Covid-19 pandemic and beyond, technology has become central to growth and prosperity processes in several industries, including education. However, this has created a number of issues for the sector, particularly in light of the complete shutdown of the educational system and efforts by various nations to mitigate the pandemic's effects on the sector by relying on distance learning (e-learning)and blended learning.

Educational institutions started to look for, consider, and race to modernize their educational systems and depart from conventional approaches and their old structures, in which the student's role is detrimental, as he or she is only a receiver of information, receptive to it, and does not actively participate in its preparation or delivery. The teacher is the focus of educational blindness, and he or she alone has the responsibility to search for the knowledge and information that he or she wants to teach to students, prepare it, and deliver it.

However, with the introduction of the computer, the Internet, and technological development, the role of the teacher has changed. A teacher has become a designer of the educational process, a planner, facilitator, and evaluator of its goals. A teacher also encourages students to interact with it, integrate with it, and contribute to enriching its information from various sources, making it more effective, active, and information-seeking, using modern technological tools (Darwaza, 2019).

On the other hand, the student's role has evolved into that of a participant in the educational process, helping to gather information, preparing PowerPoint presentations and videos related to lessons, and being responsible for the learning process, controlling and guiding it, which has helped improve the student's learning experience overall (Darwaza, 2019).

It was after the Corona pandemic spread that principals and teachers were compelled to teach students by utilizing various technical applications like Teams, Zoom, and social networking sites. When they started creating chat groups on Messenger and WhatsApp, ministries of education around the world began to consider blended learning and its implementation in educational institutions.

The concept of blended learning is based on the premise that learning should be ongoing and permanent rather than a one-time event. As a result, if the method of integration is created in accordance with high standards, learning can be dramatically improved. Blended learning does not deprive the learner of the chance to interact directly with his or her teacher; it gives each student the freedom to select the educational resources that best suit his or her unique needs and circumstances, allowing students to express their opinions and ideas, and improving human aspects and social relationships. Additionally, blended learning offers a constant interaction setting and supports both the management of the educational institution and the happiness of its students. In light of this, most institutions favor blended learning methods over one-way programs.

The notion of computer-assisted language learning (CALL), which refers to the use of computers for language teaching and learning, emerged because of the application of technological tools in the field of language teaching and learning. Despite being effective in raising the standard of language learning, it still lacks definite theoretical underpinnings and methodologies. Since technological tools are widely available and affordable in most developed nations, the use of computers in language instruction is not a new trend. It has a significant positive impact on education because it makes learning a language very enjoyable (Chhabra Dhamija, 2013).

Information and communication technologies (ICTs)unquestionably have an impact on how languages are taught and learned, as Hubbard (2009)has shown. Given the advancements made, it is now possible to state that computer-assisted language learning (CALL)is a multidisciplinary area that has reached a point of stability in language education. In addition, the use of language-

learning software and applications has evolved into a widespread social phenomenon.

Teachers and students must clearly define their objectives and take into account all barriers and challenges. Cultural, institutional, and infrastructure issues need to be addressed in order to successfully plan and use technology in language classrooms (Harasim, 2017).

As a method of communication between members of society, language is one of the most significant aspects of human civilization. It signifies identity and culture and has been used to transmit the history of nations (Madkour, 2006). One of the significant languages that has changed over time and space is Arabic. During the age of the scientific and information revolution, methodand techniques for teaching Arabic were developed to keep up with advancements in science and technology.

If a teacher does not have a working knowledge of the technical aspects that assist him or her in teaching and a tendency to use specific tools, like computers and the Internet, he or she will not be able to impart knowledge to students in the Arabic language with a sound and interesting understanding. Once the objectives of using a computer and the Internet have been met, efforts must be made to maintain the positive trend among teachers, as its significance and educational benefits are vital; teachers urgently require specific tools for teaching that will bring material closer to the student's understanding.

Academic achievement has received attention from those interested in the educational process because of its significance in students' lives and the implications of its results for important educational decisions. In fact, academic achievement is a fundamental criterion for most decisions pertaining to students, the curriculum, and the educational process. According to this criterion, the amount of students' progress in their studies is identified and distributed across various types of education (Al-Shammari, 2012).

Trends tend to qualify individuals to respond to specific behavioral patterns toward people, ideas, incidents, situations, or certain things, and compose a complex system in which a large group of variables interacts. This is where attitudes toward language become important because they do more than just reflect these feelings or responses; they integrate them into another system and interact with other elements (Nashawati, 2003).

As a result, studies on attitudes towards language in general, and the Arabic language in particular, have produced a variety of results. The differences in students' attitudes toward the language are attributable to the programs offered to them, the manner in which they are presented, as well as the individuals who provide them, since teachers have a significant impact on how students develop their attitudes toward learning Arabic (Yaqout, 2017).

According to Mohamed Nour and Mustafa (2010), there is a downward trend in primary school students' attitudes towards reading in Arabic. There is no difference in attitudes towards reading between males and females, and there is a positive correlation between student achievement in Arabic and their positive attitudes towards the language. Additionally, the majority of students make favorable progress toward learning Arabic, and there is a significant correlation between students' attitudes and their motivation to learn Arabic (Zakaria, 2011).

The development of an individual's cognitive and emotional aspects depends on the processes designed for them in a coordinated manner, and Al-Khalifa (2014)confirms that the general objectives of any course are built according to the directions that the individual tends to or desires. Behaviors in the field of life differ according to those trends. Trends are also the fundamental framework on which educational activities are built. These activities depend entirely on the analysis of a person's personality and knowledge of the diagnostic traits that reveal his or her tendencies, and they achieve great success in the educational process thanks to guidance, ongoing support, sequential performance evaluation, and knowledge of the results that occasionally reach it. The individual's understanding of themselves and efforts to improve their performance are greatly influenced by these trends. Based on the foregoing, the purpose of this study is to determine any possible effect of programmed instruction on sixth-grade students' proficiency achievement in Arabic and their attitudes toward it in Jordan.

Many scholars have examined the effects of programmed instruction on students' achievement in the Arabic language and its advantages after evaluating earlier studies and their indices that were directly or indirectly related to this study.

Ali (2017)conducted a study to determine how programmed instruction affected students' academic performance at the elementary education level. To accomplish the goals of the study, the researcher used both a semi-experimental approach and a descriptive analytical approach. The study was carried out in East Nile Governorate, Khartoum State, Sudan. The study sample included 106 students from Al-Waha Basic Schools who were split into two groups: an experimental group of 53 students who studied using a computerized system and a control group of 53 students who used a traditional educational approach. The researcher created a programmed text for the seventh-grade Arabic grammar course to address the research questions. The findings indicated that differences in student achievement were attributed to the teaching strategy and favored the experimental group.

Mahmoud (2017)conducted a study to determine the effects of using programmed instruction in learning Arabic grammar for second-year secondary students (explanation and substitution)by computer in comparison to the traditional method. The researcher used an experimental approach, and the study sample included 40 students from Al Barari Model Secondary School for Girls, who were split into two equivalent groups. One group was given a computer-based program to teach them Arabic grammar. In the collection of the post-test, there were statistically significant differences between the experimental and control groups in favor of the experimental group.

To better understand how flexibility and clarification techniques affect academic performance, language intelligence, and attitudes towards Arabic among Iraqi vocational education students, Khalaf (2021)performed a study. To apply the educational program to the experimental group, the researcher divided the vocational education students into two divisions, with 30 male and female students in the experimental group and 30 male and female students in the control group. The study employed an educational program, a language intelligence exam, and an achievement test. After applying statistical analysis, the results revealed that the degree of achievement given to each student had no statistically significant variations at the level of α=0.05 due to the students' gender.

In Miqdadi's study (2021), conducted in the first semester of 2020/2021, the study population was made up of Arabic language teachers for the first three grades in government schools in the Irbid Directorate of Education. The study's objective was to determine the effectiveness of using computer-aided programming education in teaching Arabic for the first three grades from the teachers' perspective. The study concluded that there was a moderate level of support for the use of computer-aided programmed instruction in teaching Arabic.

Al-Shabibi (2021)conducted a study to evaluate the efficacy of blended learning utilizing wikis in fostering written expression skills in sixth-graders. To carry out the study's goals, the researcher adopted a semi-experimental methodology. A sample of 60 sixth-grade students was divided equally into a control group and an experimental group. They were given an achievement test and a list of Arabic language skills. The results revealed statistically significant differences in content, language, and style skills in favor of the experimental group, but not in form and organization skills.

Commenting on previous studies through the presentation of earlier research, it was discovered that the use of e-learning generally, and blended learning in particular, in pre-university general education may still require further research and study. It was noted that many studies focused on the use of these technologies in higher education. Additionally, there is a paucity of research on the use of technology in education as a novel form of instruction. Some studies have demonstrated that using the blended learning strategy led to better test scores on achievement tests compared to more traditional methods. Moreover, the majority of studies advocate for the use of a variety of contemporary technologies in education and for training students and teachers on how to utilize and construct websites on the Internet for learning and teaching. Therefore, it can be claimed that referencing and studying several prior studies has provided benefits across various sectors. One of these benefits is establishing a thorough understanding of the blended learning approach and its application in teaching and learning Arabic.

The current study differs from other studies in many ways, including research tools, community, objectives, and selected topics, as no previous study addressed achievement in the Arabic language at this particular stage within the same society. To the knowledge of the researchers, this gives it special importance. The current study shares some similarities with a number of previous studies in scientific methodology and some of the tools used but also exhibits notable differences.

The Problem and the Questions of the Study

Educational technology is an essential part of the integrated support system that students who suffer from low achievement rates need. When learning language skills in particular, they often experience a general weakness in various language abilities. Thus, educational technology controls the presentation of the desired language material in terms of size, color, shapes, and images, which motivates students to engage and perform better. Devices, tools, materials, and teaching aids contribute to raising the achievement rates of these students and reducing the difficulties and obstacles they face in the educational process (Metwally, 2022).

By relying on more contemporary, appealing, and motivating approaches to scientific material, learners now play a larger role in the educational process beyond just the teacher and the textbook. One of these contemporary teaching approaches, which prioritizes learner activity, is the method of programmed instruction. By providing interactive learning that enables students to study and communicate continuously with their teachers, it enhances the educational environment and increases students' inclination towards this type of education. It also helps address many challenges, such as cognitive and intellectual development.

Trends play a major role in an individual's choice of the type of education or work they desire. The appropriateness of education or work for each individual is one of the most important functions of education in general. Young people have trends that help them adapt to the developments and challenges of the times, and they work to change undesirable trends that hinder societal growth and development. Additionally, researchers have

discovered that programmed instruction might be the best way to address current deficiencies to a reasonable extent. These research and problem-solving methods are summarized in scientific deduction and induction using programming methods in education.

The researchers directed teachers' attention to the need for immediate implementation of blended learning because students require training in self-learning. They need to combine traditional instruction with educational software and online networks to maintain constant engagement with science both inside and outside of school. As a result, the teacher's role in the educational process becomes that of a guide, thereby achieving educational goals.

Some studies, such as those by Bani Diab (2011), Abdel Razek (2010), and Abou Al-Enein (2011), have shown a need to employ technological innovations. They change attitudes towards technological innovations by raising awareness of their value and the ways to benefit from them in education. In conclusion, the major research question that identifies the study's problem is, "What influence does programmed instruction have on sixth-grade students' proficiency and attitudes towards it in Arabic?" The study addresses the following two minor questions within the framework of its core research question:

1. **First:** Are there statistically significant differences at the level of significance \alpha = 0.05 in Arabic language proficiency achievement among sixth-grade students that can be directly attributed to the teaching strategy: programmed instruction or the conventional approach?
2. **Second:** To what extent is the programmed instruction strategy responsible for any statistically significant differences at the level of significance \alpha = 0.05 in the attitudes of sixth-grade students towards the teaching strategy?

The Significance of the Study

From both a theoretical and practical standpoint, the research is significant since it concentrates on studying one of the most recent technical instruments being utilized in the educational sector right now. It emerged as a reflection of contemporary global and local educational trends that sought to incorporate technology in education. The study investigates the influence of programmed instruction in teaching Arabic. It benefits from the advantages of programmed instruction and addresses the general weakness in the Arabic language, as well as the formation of negative attitudes towards it, which is a natural product of the conventional teaching methods used in teaching Arabic. Additionally, it provides information on the potential impact of programmed instruction on students' academic success and attitudes towards the study of Arabic. The development of Arabic language instructors' teaching and evaluation strategies is intended to be helpful. The current study opens new avenues for researchers to undertake follow-up research on the efficient application of programmed instruction in the educational process across various teaching stages and subjects.

Operational Definitions Attitudes: The mental position regarding a fact or a state, which includes positive or negative feelings, can be described as someone's attitude. The results of sixth-grade students' reactions to the Arabic language, whether they are accepting, indifferent, or rejecting it, are indicated by the grades they received on a scale that was specifically created for this study. Students in the sixth grade in Jordan are aged 12 to 13 years during the academic year 2022/2023.

Academic Success: Accomplishment is defined as a collection of ideas, insights, and skills that a learner acquires by progressing through the educational process. In this study, the sixth-graders' marks on the accomplishment exam created for this purpose serve as the benchmark for measuring achievement.

Programmed Instruction: This refers to a group of steps arranged by the individual learner in a self-learning process. In this study, it denotes the strategy in which sixth-graders work with a program to achieve educational goals. It relies on organizing the educational content in the form of a programmed booklet based on breaking the academic topic down into a set of steps arranged in sequential order aimed entirely at achieving specific basic competencies, with each step connected to one another. Each step is followed by a question that helps sixth-graders assess their understanding.

Arabic Language: Arabic is a language with phonetic symbols used for social and individual communication, possessing corresponding systems in words, structures, and sounds for Arab students.

Limitations of the Study

The following limitations and determinants were the exclusive focus of the study. First, the study's primary objectives were to assess the efficiency of using programmed instruction to teach Arabic to sixth-graders in the Irbid Directorate of Education in Jordan, as well as their attitudes towards the language. Second, personal limitations include a representative group of sixth graders from Irbid's public schools connected to the Directorate of Education. Time limitations refer to the first semester of the academic year 2022/2023. The reliability and consistency of the tools show the correctness of the results, and the achievement that has been addressed and the tendency towards the Arabic language indicate how far the results of this study may be applied.

Methodology

A quasi-experimental design technique, based on the utilization of two unequal groups (unequal group design), was employed to accomplish the study's aims. In accordance with the purpose of the study, the researchers also used a descriptive and analytical technique. They

created a questionnaire to gauge the views of sixth-graders about the Arabic language.

The Sample of the Study

The study sample consisted of 66 students divided into two groups (experimental and control). The sample members were purposefully chosen from Jordanian sixth graders during the first semester of the year 2022-2023. The sample members were randomly assigned to the two groups, and the effect of programmed instruction on student achievement in the Arabic language was studied utilizing the control group, which included 33 students. The experimental group was made up of 33 students who pursued their studies as usual. To check the equivalence of the two groups, a two-sample T-test was used, as shown below in Table 1.

Table 1: A T-test for equivalence of the control and the experimental group.

Groups	N	Mean	Std. Deviation	Std. Error
Control Group	33	15.12	2.98	121.04
Experimental Group	33	14.94	3.14	122.32

The study's data were gathered using the two instruments listed below. First, the proficiency of sixth-grade pupils in Arabic was observed. Second, a paragraph-long questionnaire was constructed to measure the variables of the study and was composed of 40 items analyzing sixth-grade students' opinions regarding the Arabic language.

Validity and Reliability

The validity and reliability of the test come first. To ensure its validity, a group of professors from Jordanian public universities with expertise in the Arabic language, curricula, and teaching methods was presented with a multiple-choice achievement test that contained 25 items in the Arabic language. The arbitrators' opinions on the Arabic language achievement test were as follows:

The exam items were comprehensive, rich in test vocabulary, and accurately formulated linguistically. The number of paragraphs required to adequately assess the subject's academic success in Arabic was appropriate. The paragraphs' age appropriateness for the target audience was achieved. Suitable statistical calculations were made after the test was administered to the research sample. The typical proficiency of sixth-grade students in the Arabic language is measured by the test's average answer time. According to the calculation of the mean time taken by the first student upon completion, which was 35 minutes, and the time taken by the last student who finished answering, which was 55 minutes, the average time calculated for answering the paragraphs of the Arabic language test was 45 minutes.

Coefficients of difficulty and discrimination for the Arabic achievement test for sixth graders were calculated. The difficulty and discrimination coefficients for the test items were determined by analyzing the responses of a survey sample outside of the study sample, which consisted of 15 students. The results are shown in Table 2 below for each paragraph of the test.

Table 2: Coefficients of difficulty and discrimination of Arabic achievement test.

Paragraph number	Discriminatory Factors	Difficulty Coefficients
1)	0.500	0.350
2)	0.600	0.500
3)	0.500	0.550
4)	0.500	0.550
5)	0.500	0.650
6)	0.400	0.400
7)	0.600	0.600
8)	0.600	0.600
9)	0.400	0.600
10)	0.400	0.400
11)	0.600	0.500
12)	0.500	0.350
13)	0.400	0.500
14)	0.500	0.550
15)	0.600	0.500

Paragraph number	Discriminatory Factors	Difficulty Coefficients
16)	0.600	0.600
17)	0.500	0.650
18)	0.600	0.600
19)	0.600	0.600
20)	0.800	0.500
21)	0.500	0.550
22)	0.500	0.650
23)	0.500	0.650
24)	0.600	0.600
25)	0.700	0.550

Table 2 shows that the difficulty coefficients ranged between 0.350 and 0.650, which are considered acceptable if they fall between 0.20 and 0.80. The discrimination coefficients ranged between 0.400 and 0.700, which is considered good, as the discrimination coefficient for a paragraph is deemed good if it exceeds 0.39. If it ranges between 0.20 and 0.39, it is considered acceptable, and it is recommended to improve it. It is deemed weak and recommended for deletion if the paragraph discrimination coefficient is less than 0.19. Any paragraph with a negative discrimination coefficient must be deleted; however, all the discrimination coefficients were good, indicating that no paragraph needs to be deleted.

By administering the test to a group of 15 children outside of the study sample and then administering it again two weeks later, the test-retest approach was employed to confirm the stability of the achievement of sixth-grade pupils in the Arabic language. The internal stability coefficient, calculated using the internal consistency method in accordance with the Coder Richardson-20 equation, was 0.871, and the Pearson correlation coefficient between the estimations obtained at the two different times was 0.868. These values are suitable for the goals of this investigation.

The second part of the reliability and validity of the tool refers to the "attitudes of sixth-grade students towards the Arabic language." The researcher used a five-point Likert scale to measure the opinions of the study sample participants, with the following scale: always (5), often (4), sometimes (3), rarely (2), and never (1). By marking a sign in front of the answer that reflects the degree of their approval, the scale for "evaluating the attitudes of sixth-grade students towards the Arabic language" was ultimately reduced to 39 items. Low is defined as 1.00 to 2.33, medium is from 2.34 to 3.67, and high is from 3.68 to 5.00.

The study tool was presented to a jury made up of university professors to express their opinions on the validity of the current study tool. The jury then reflected on the researcher's responses, and an agreement rate of 80% was adopted among the jury members.

The Results of the Study

The following statistical techniques were applied to the study's questions to obtain answers by calculating the group members' ratings on the scale of orientation and academic achievement using mathematical averages and standard deviations. To evaluate the study's hypotheses, a two-way analysis of variance test was used to determine the significance of the changes in the averages between the experimental and control groups, both before and after the use of programmed instruction. A T-test was employed to examine pre- and post-measurement differences across groups.

The pre-achievement test in Arabic was administered to the students in the study sample to verify the comparability of study groups before implementing the study procedures for achievement. Prior to the start of the experimental treatment, the T-test was evaluated based on the marks earned by the study sample's students in a pre-achievement test. The findings of this investigation can be seen in Table 3 below.

Table 3: A T-test of the scores of the study sample's students in the pre-achievement test.

Method of Instruction	Pre-test		Post-test		Modified performance		N
	mean	Std. deviation	mean	Std. deviation	Adjusted mean	Std. error	
Programmed Instruction	12.212	3.324	18.152	3.447	18.098a	0.464	33
Conventional	11.970	3.067	14.424	2.463	14.477a	0.464	33
Total	12.091	3.176	16.288	3.516	16.288a	0.328	66

The pre-measurement of the achievement of sixth-grade students in the Arabic language indicated that the value of ***t*** was 0.308, with a statistical significance of 0.759. There were no statistically significant differences between the control and experimental groups at the significance level (\alpha = 0.05). The equivalence of the

two groups in the pre-measurement was indicated by the significance level being above the value of ($\alpha = 0.05$).

The presentation of the findings in relation to the question that the study sought to answer shows that, at the significance level ($\alpha = 0.05$), there were no statistically significant differences in the growth of achievement attributed to the teaching method. Regarding the teaching strategy variable (the effect of programmed instruction on achievement (experimental)versus the conventional method (control)), the means and standard deviations of the achievement of sixth-grade students in the Arabic language were calculated to provide an answer to this question.

Based on the differences in circles purportedly related to the achievement of sixth-grade students in the Arabic language, it was decided to test the impact of the teaching strategy model on the performance of sixth-grade students in the achievement test. Table 4 below shows that there is an apparent difference in the performance of the study sample in both groups (experimental and control)regarding the achievement of sixth-grade students in the Arabic language before and after. There is a common variable in the pre-achievement test.

Table 4: ANOVA test of the effect size of the programmed instruction method.

Source of variance's	Sum of Squares	Degrees of Freedom	Mean Squares	F-Value	Significance Level	Effect Size
Pre-skills (Accompanying)	126.172	1.000	126.172	17.738	0.000	0.220
Group	216.002	1.000	216.002	30.366	0.000	0.325
Error	448.131	63.000	7.113			
Total	803.530	65.000				

Table 4 shows that the experimental group, which used the programmed instruction method, outperformed the other group. This could be due to the statistically significant differences between the average achievement scores of sixth-grade students in the Arabic language resulting from the impact of the teaching strategy, where the value of P equals 30.366 and the statistical significance amounted to 0.000, which is less than the level of statistical significance ($\alpha = 0.05$). The adjusted mean of the test results for the control group was 14.477, whereas the mean of the test results for the experimental group was 18.098. In ascending order, the size of the effect was determined by finding the eta squared, which was 0.325. This means that 32.5% of the variation in the achievement of sixth-grade students in the Arabic language is due to the teaching strategy, with programmed instruction affecting achievement, while the remaining variation is due to other factors. This was done to demonstrate the effectiveness of teaching.

Perceptions of the Arabic language results pertain to the parity of study groups. In the pre-measurement of the achievement of students in the lower basic stage in Arabic, where the value of 'T' equals 0.308 with a statistical significance of 0.759, there were no statistically significant differences between the control and experimental groups at the level of significance ($\alpha = 0.05$). The two groups are equivalent on the scale of trend since the significance level was higher than the value of $\alpha = 0.05$.

The presentation of the findings in relation to the question that the study sought to answer is as follows: The averages of the experimental group's scores on the attitude toward the programmed instruction scale show favorable trends with statistical significance at the level of significance ($\alpha = 0.05$). The means and standard deviations of the items on the scale used to determine how Jordanian students in lower basic schools felt about the Arabic language were computed to provide an answer. This is illustrated in Table 5 below.

Table 5: The feelings of Jordanian students in lower basic schools about Arabic language.

Rank	Item	Statement	Mean	Standard Deviation	Degree
1	s17	I get very frustrated with Arabic language classes because of their multiple skills and numerous activities.	4.288	1.034	High
2	s26	I believe that learning Arabic language does not add anything to my knowledge.	4.167	0.834	High
3	s8	I am content with the assigned textbook in Arabic language.	4.136	0.959	High
4	s7	Arabic language classes pique my interest.	4.136	0.959	High

Rank	Item	Statement	Mean	Standard Deviation	Degree
5	s19	I feel bored during Arabic language classes.	4.121	1.074	High
6	s9	Arabic language classes provide me with opportunities to research additional related topics.	4.121	0.920	High
7	s20	Arabic language classes enable me to acquire many language skills.	4.121	0.869	High
8	s25	I would be happy to eliminate Arabic language as a subject from the curriculum.	4.106	0.844	High
9	s18	I enjoy constantly exploring various Arabic language books.	4.015	0.953	High
10	s5	I borrow books related to Arabic language from the school library.	4.000	1.038	High
11	s3	I want to reduce Arabic language classes.	4.000	1.038	High
12	s37	I do not enjoy participating in Arabic language competitions.	3.970	0.841	High
13	s11	I apply what I learn in Arabic language classes in my daily life.	3.970	0.976	High
14	s27	I believe that it is possible to learn without Arabic language.	3.970	0.859	High
15	s1	Increasing Arabic language classes help me better understand it.	3.970	1.176	High
16	s12	I feel happy when Arabic language class is converted into a school activity or something similar.	3.970	1.007	High
17	s29	I see Arabic language as an easy and enjoyable subject.	3.924	1.100	High
18	s24	I enthusiastically follow my Arabic language homework.	3.909	0.836	High
19	s21	I see Arabic language as easily forgotten.	3.909	1.034	High
20	s35	I see Arabic language as necessary in our lives.	3.909	1.077	High
21	s15	I find it difficult to solve questions related to Arabic language skills and its branches.	3.894	1.054	High
22	s34	I benefit from Arabic language in studying other subjects.	3.879	0.920	High
23	s4	The abundance of Arabic language skills and branches confuse me.	3.864	1.094	High
24	s38	I enthusiastically follow programs that talk about the Arabic language.	3.833	1.145	High
25	s22	I feel happy when learning the Arabic language.	3.833	1.158	High
26	s10	I find learning Arabic language difficult.	3.818	1.149	High
27	s23	I believe that learning Arabic language is necessary for every student of knowledge.	3.803	0.932	High
28	s28	I prefer Arabic language classes over other subjects.	3.803	1.056	High
29	s36	I would love to become an Arabic language teacher in the future.	3.788	1.089	High
30	s32	I love Arabic language because it is the language of the Quran.	3.773	1.107	High
31	s13	I can explain any Arabic language lessons to my classmates.	3.758	0.912	High
32	s16	I desire to learn a lot about Arabic language.	3.727	1.001	High
33	s30	I feel that Arabic grammar rules are not important.	3.712	1.134	High
34	s6	Only a few students succeed in Arabic language subject.	3.652	1.209	Medium
35	s2	I eagerly await Arabic language classes.	3.591	1.289	Medium

Rank	Item	Statement	Mean	Standard Deviation	Degree
36	s39	I don't enjoy participating in discussions about the Arabic language.	3.485	1.140	Medium
37	s31	I believe that Arabic language subject is only important for those specializing in it.	3.485	1.243	Medium
38	s33	I believe that Arabic language helps learners solve many problems.	3.288	1.212	Medium
		Overall Attitudes of Lower Basic Stage Students in Jordan towards Arabic Language	3.870	0.552	High

The means and standard deviations of the paragraphs regarding "attitudes of students in the lower basic stage in Jordan towards the Arabic language subject" ranged from 3.242 to 4.288. The highest score was for paragraph No. 17, which states, "I am very annoyed by the Arabic language classes because of the multiplicity of its skills and the large number of its activities," with an average of 4.288. Paragraph 26, which begins, "I see that learning Arabic does not add anything to my information," came in second. Number 14 states, "I observe," with an average of 4.167, and in last place is, "I am aware of how challenging it is to use what one learns in Arabic language classes in daily life." The mean for the field "Attitudes of lower basic stage students in Jordan toward the Arabic language" as a whole was 3.870, with an average of 3.242, indicating a significant degree of attitudes. The t-test was used to identify differences in the average attitudes that lower basic stage students in Jordan had towards the subject of Arabic language learning between those who studied using the effect of programmed instruction on achievement and those who studied normally.

According to the teaching strategy of programmed instruction on achievement and the conventional method, where the value of "T" was 9.738 and statistically significant ($p < 0.000$), there were statistically significant differences in the "attitudes of lower basic stage students in Jordan toward the Arabic language" overall at the level of significance ($\alpha=0.05$). Based on the effect of planned instruction on achievement, the differences favored the experimental group, and the significance level was lower than the value of $\alpha=0.05$, indicating statistical significance.

Discussion of the Results

Statistically significant differences between the averages of the members of the experimental group and the control group in the post-achievement test can be attributed to the teaching method. This confirms the existence of statistically significant differences in favor of the experimental group that studied using the programmed instruction method. The results of the study showed improvements in the performance of students in Arabic language who studied in this way, indicating that the use of the programmed instruction method has a positive impact on the achievement of sixth-grade students in the language. Here, we can conclude that if educational activities are designed to motivate students, attract their attention, and give them control over educational activities (Nabah, Hussain, Al-Omari, & Shdeifat, 2009), it can lead to better outcomes.

These results can be attributed to a new teaching strategy that was utilized to teach Arabic instead of the conventional method. This strategy involved the use of multimedia-rich educational software that included sounds, still and moving images, and texts to transform abstract scientific concepts, which are challenging for students at this age to understand and comprehend, into tangible concepts and life experiences that they interact with in a setting full of suspense and excitement.

The concept of self-learning and the individualization of education are activated; students can evaluate themselves, have access to immediate feedback, and can control the progress of their learning process according to their speed and ability to learn. This activation of the concept of self-learning and the individualization of education is advocated by modern educational theories.

In contrast to the students in the control group, the experimental group's students found the learning process to be fun and reassuring. They had the option of using the software again to correct their errors without feeling guilty or afraid. They also felt more motivated to learn in an environment where there was competition for better performance, simply because they were using the new method of teaching.

The researchers also credit this excellence, in their opinion, to the benefits of programmed instruction over conventional teaching strategies recognized by the Jordanian Ministry of Education. These benefits include accurate goal-setting, breaking work into manageable steps that increase the chances of success, and reinforcement for the learner that boosts motivation for learning. The logical steps are the learner's logical thinking and the variety of teaching aids within the same program, where the stimuli can be displayed in one program through animated films, fixed slides, images, audio recordings, and others (Ibrahimi & Hassan, 2023). This gives the learner the opportunity to learn according to his or her own abilities without comparing with peers.

The findings of the current study support what Al-Tal et al. (2008)said about individual education (single education), considering that programmed instruction primarily depends on the principle of individual

education. They stated that this type of education necessitates developing a new educational system based on each student's self-knowledge in all areas of cognitive, mental, emotional (psychological), physical, and motor development to set him or her up for success and to provide the necessary tools to succeed. The success of any educational system is determined by the degree to which students accomplish the objectives to ensure that the greatest number of students receive grades in the high range.

The findings of this study are in line with those of Ali (2017), Mahmoud (2017), and Dahlan (2014), whose findings revealed a statistically significant difference in favor of the experimental group due to the use of computers or the programmed teaching method as opposed to the conventional method of instruction. In contrast, the findings of Miqdadi (2021)and Khalaf (2021)demonstrated that there was no statistically significant difference in student accomplishment attributable to the teaching technique. This is in line with research by Katasila Poonpon (2022), which showed better educational accomplishment in vocabulary acquisition, and research demonstrating the efficacy of employing blended learning to increase students' academic achievement in a course.

According to the answer to the second question, there are statistically significant variations between sixth-grade students' views about the Arabic language because of the teaching methods (programmed instruction and the conventional approach). When compared to their peers who learned the traditional way, the difference was in favor of the children who learned through programmed learning.

A large number of movements, stimuli, video sounds, colors, diverse activities, and the diversity of reinforcement associated with the activities included in the programmed instruction explain the high averages of the experimental group students compared to the control group students in the trend scale.

In addition to the role of programmed instruction in preventing student boredom through educational situations, it increased the rate of student self-confidence, which grew the students' sense of the Arabic language due to the diversification in the method of teaching and interaction between the student and the device by repeating the lesson more than once with a lot of reinforcement. The fact that the experimental group performed better may also be attributed to the fact that programmed instruction provided students with a conducive environment to interact freely and easily. This helped them develop positive tendencies like self-worth, self-confidence, a sense of tranquility, psychological comfort, accompanying reinforcement, and respect for points of view; student activity, especially in an environment of silence, stillness, and respect for differing opinions.

The characteristics of programmed instruction encouraged students to learn Arabic, stimulated their memory, and gave them the chance to collaborate, plan, organize, create, innovate, and interact with the content of the two units flexibly, explaining this result. This interpretation is consistent with the studies of Al-Qawas (2006)and Dahlan (2014), which indicated that education based on technological innovations helps to develop achievement.

The information and ideas, rather than being abstract as is typically the case, can be attributed to the experimental group's superior performance over the control group in sixth-grade students' attitudes toward the Arabic language. The information was associated with images, colors, or shapes, making it more exciting, attractive, and fun, which resulted in the formation of positive attitudes among sixth graders. This finding is in agreement with several studies that assessed people's attitudes toward computers, including studies by Madkour (2018), Al-Atiwi (2021), and Al-Mabhouh (2011), which found differences in favor of the computer-studying group, and studies by Bitar (2018), which looked at the development of visual thinking abilities and the trend toward mathematics.

Conclusion and Recommendations

The study suggests encouraging teachers to teach Arabic language themes, skills, and other general subjects via programmed instruction. Programming and creating various Arabic language courses for use in teaching through programmed instruction at all educational levels, starting from the lower and upper basic stages, are very helpful for sixth graders. Providing devices to aid in the input of video clips, still images, educational graphics, and other tools contributes to typical lessons in each educational setting. There should be continuous participation in holding training sessions for teachers to assist them in designing and producing multimedia elements, including motion pictures, written texts, and graphics. Conducting further research on the effects of using programmed learning in the teaching of various subjects at different study levels is highly recommended.

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