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Investigating the Effect of a Researcher-Developed Educational Simulation Software for Science Lessons on Learning Outcomes and Academic Achievement Motivation among Sixth-Grade Students in Smart Schools of Tehran

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Abstract
The present study aimed to investigate the effect of researcher-developed educational simulation software for science lessons on the learning outcomes and academic achievement motivation of sixth-grade students in smart schools in Tehran. In terms of its nature, subject matter, objectives, and hypotheses, this study was applied and employed a quasi-experimental research design. The statistical population consisted of all male sixth-grade students studying in smart elementary schools in Tehran during the 2023–2024 academic year. A smart elementary school, Nezam Mafi School, was selected as the research setting using purposive sampling. The dependent variables of the study were learning outcomes and academic achievement motivation, which were measured using relevant instruments. The research instruments included: (1) a researcher-developed science learning achievement test for sixth-grade students and (2) Hermans' Academic Achievement Motivation Questionnaire. The content validity of the learning achievement test was evaluated and confirmed by the academic supervisors, advisors, and experienced science teachers. The validity of the academic achievement motivation questionnaire was also confirmed by supervisors, advisors, and experts in the field. The reliability coefficient of the learning achievement test, calculated using the Kuder–Richardson method, was 0.75, and the reliability coefficient of the academic achievement motivation questionnaire, calculated using Cronbach's alpha, was 0.84. The collected data were analyzed using analysis of covariance (ANCOVA) through the SPSS software. The findings indicated that the learning outcomes and academic achievement motivation of students who received instruction through educational simulation software were significantly higher, with 95% confidence, than those of students who were taught using conventional instructional methods.

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Introduction

In the contemporary era, the rapid and continuous growth of transformations in various aspects of human life has brought about profound changes in the scope of human existence and intellectual development. These transformations, which possess a global and transnational nature, have exposed educational institutions and the teaching and learning strategies employed by them to complex challenges (*Chahardah Masoumi et al., 2024*). The continued survival of educational systems through traditional instruction, reliance on textbook content, viewing students as passive recipients of knowledge, and considering teachers as the central figures in the educational process is no longer feasible in today's rapidly changing world (*Asadisharif et al., 2025*).

Over the past three decades, several fundamental transformations have occurred in education systems across different countries. These transformations can be broadly categorized into three major groups: (1) active, collaborative, student-centered, and process-oriented teaching and learning; (2) the integration of information technology into teaching and learning processes; and (3) emphasis on global skills education and attention to diverse contexts (*Estakhrian Haghighi, 2019*). Despite these extensive changes, merely accumulating information and knowledge in students' minds through schooling is insufficient and can never adequately prepare them for real-life experiences beyond the classroom. Therefore, educators and teachers should shift their focus from simply transmitting various types of knowledge toward employing effective teaching and learning methods and strategies (*Rayatdost et al., 2024*).

Teachers need to develop an open and reflective perspective, be willing to experiment with diverse approaches, and remain receptive to new information regarding learning and learners. They should move beyond traditional roles and transform into what Carl Rogers referred to as "facilitators of learning" and what Keller described as "instructional engineers" or adaptive managers (*Amerstorfer & Freiin von Münster-Kistner, 2021*). As mentioned, entering the domain of modern management reveals the reality that technology has influenced all aspects of human life, and the educational system is no exception. The digital world and emerging technologies have provided appropriate environments for collaborative, student-centered, and skill-based learning (*Golzar Aziz et al., 2024*).

Educational specialists and instructional technologists argue that achieving diverse curriculum objectives requires the effective utilization of modern instructional methods and media. Electronic educational content, including educational software and multimedia materials, represents one of the programs that can be easily designed and developed with the assistance of computers (*Besalti & Smith, 2024*). Among the various forms of electronic content that can significantly contribute to improving learning, retention, and subsequently enhancing educational quality are educational simulations (*Zolfaghari et al., 2021*).

One example of applying educational technologies in the teaching process is the use of simulations of scientific events and phenomena. In recent years, the application of simulations in teaching subjects such as medical sciences, biology, physics, mathematics, astronomy, and geology has expanded considerably (*Khoshtale & Vasefian, 2019*). Simulation represents a version of actual tools, systems, or workplace situations and attempts to demonstrate certain behavioral aspects of a physical or abstract system through the behavior of another system. Through simulation, the effects of possible real-world conditions can be reconstructed within an artificial environment using a simulator (*Nyström & Ahn, 2024*).

In fact, simulation software provides learners with an environment that closely resembles real-world settings while avoiding the high costs and risks associated with direct interaction with actual environments. This feature can be effectively utilized in educational contexts (*Elendu et al., 2024*). Teaching through simulations to deepen scientific knowledge and conceptual understanding has attracted considerable attention from educators and learners (*Richardson & Long, 2003*). The modern world requires students to take partial responsibility for their own learning processes, and education should be designed in a way that enables individuals not only to manage and solve their personal life problems but also to adopt appropriate strategies when confronting environmental and social challenges (*Keyvani & Jafari, 2015*).

Research indicates that educational simulations are among the most effective approaches for enhancing students' academic engagement and motivation by activating learners' roles in the instructional process (*Nsabayezu et al., 2023*). Researchers argue that academic engagement occurs when students become deeply immersed in learning activities and are mentally and emotionally absorbed in the learning materials (*Talan, 2020*). Field trips, peer learning, practical activities, and particularly educational simulations represent various forms of academic engagement and active learning (*Amerstorfer & Freiin von Münster-Kistner, 2021*).

Therefore, methods and tools capable of increasing students' interest in learning and enthusiasm for educational activities can indirectly contribute to improving learning outcomes and enhancing the quality of educational systems (*Mansoori & khodaei, 2022*). Based on previous studies, given the advantages of technology in creating motivation and diversifying learning experiences, one of the platforms that can play a significant role in teaching and learning processes and promote academic engagement is educational simulation (*Sharifati et al., 2021*).

Accordingly, it appears that designing and developing educational simulations and employing them in smart schools, which provide suitable infrastructures for electronic education, can create favorable conditions for facilitating meaningful learning and problem-solving processes (*Tonapa et al., 2023*). Considering the presented arguments and previous research findings, although educational simulations play an important role in interactive learning, concretizing abstract concepts, and enhancing academic achievement motivation through activating learners' participation in the learning process, this area has received limited attention.

Furthermore, although smart schools in Iran possess considerable capabilities and facilities, many of these resources are often used primarily for promotional purposes rather than being fully integrated into educational practices. Therefore, developing electronic educational content, particularly simulation-based materials, for these schools can provide an opportunity to optimize the utilization of available facilities and enhance the effectiveness of smart school environments.

Method

The present study employed a quasi-experimental research design with two groups: an experimental group and a control group. The sampling method was purposive sampling. Accordingly, one male smart elementary school in Tehran was selected as the research setting, and in the second stage, two groups of 30 sixth-grade students were selected from the available sixth-grade classes of the selected school.

Subsequently, the experimental group received instruction in the science course using the researcher-developed educational simulation software designed for sixth-grade science lessons, whereas the control group was taught using the conventional instructional method commonly applied in smart schools. A learning pretest and an academic achievement motivation pretest were administered to both the experimental and control groups before the intervention.

The statistical population of the study consisted of all sixth-grade elementary students studying in smart schools in Tehran. The research sample included 60 sixth-grade students from Nezam Mafi Smart School in Tehran.

In this study, two tests and one questionnaire were used as research instruments:

Learning Pretest:

This test consisted of 20 researcher-developed multiple-choice questions from the science textbook unit entitled *"The Wonders of Plants."*

Learning Posttest:

This test also consisted of 20 researcher-developed multiple-choice questions designed to be parallel with the learning pretest.

Academic Achievement Motivation Questionnaire:

To measure students' academic achievement motivation, Hermans' Achievement Motivation Test was administered as both a pretest and a posttest. This questionnaire consists of 29 incomplete multiple-choice statements. The scoring procedure is based on assigning scores ranging from 4 to 1 or 1 to 4 to response options according to the level of achievement motivation, either from high to low or from low to high. Higher scores on this scale indicate a higher level of achievement motivation, whereas lower scores represent lower achievement motivation.

To establish the validity of the learning pretest and posttest, after confirmation by the academic supervisors and advisors, experienced subject teachers were consulted. The teachers evaluated and confirmed the tests in terms of relevance, clarity, comprehensibility of the items, and their appropriateness for addressing the research questions.

Hermans (1970) assessed the validity of the achievement motivation questionnaire using content validity, based on previous research on achievement motivation. He also calculated the correlation coefficients between each item and achievement-oriented behaviors, with coefficients ranging from 0.30 to 0.57. Furthermore, *Akbari (2007)*, in a study entitled *"Examining the Reliability and Validity of Hermans' Achievement Motivation Questionnaire among Secondary School Students in Guilan Province,"* reported that the questionnaire had acceptable validity. In the present study, the reliability of the researcher-developed learning test was determined using the Kuder–Richardson method, and the obtained reliability coefficient was 0.75. *Hermans (1970)* calculated the reliability coefficient of the academic achievement motivation questionnaire using Cronbach's alpha, reporting a coefficient of 0.84. For data analysis, descriptive statistics indicators (frequency, mean, and standard deviation) and inferential statistics methods (multivariate analysis of variance and analysis of covariance) were employed after examining the relevant assumptions. Data analysis was conducted using SPSS software.

Findings

- Descriptive Statistical Findings

As mentioned earlier, the research sample consisted of 60 male sixth-grade students from Nezam Mafi Smart School in Tehran. The participants were divided into two groups, including 30 students in the experimental group and 30 students in the control group (Table 1).

Table 1. Frequency Distribution of Participants by Research Group

Group	Frequency	Percentage (%)
Experimental group	30	50
Control group	30	50

Following the implementation of the research, students' pretest and posttest scores were extracted to measure the variables of learning and academic achievement motivation. In this section, the descriptive analysis of these results is presented.

In Table (2), descriptive indicators, including the minimum value, maximum value, mean, standard deviation, and number, for the learning pretest and posttest are presented separately for the experimental and control groups. As shown in the table, the mean learning pretest scores in the experimental and control groups were approximately similar; however, the mean scores obtained after implementing the independent variable in the learning posttest for the experimental and control groups indicate the better performance of the experimental group in the learning posttest.

Table 2. Descriptive Indicators of the Learning Variable by Group

Group		Minimum	Maximum	Mean	Standard Deviation	Number
Experimental	Pre-test	3	16	8.73	2.89	30
	Post-test	9	19	15.26	2.79	30
Control	Pre-test	1	16	8.36	3.13	30
	Post-test	5	19	13.13	3.37	30

To facilitate understanding the differences between the scores obtained from the pretest and posttest in each of the experimental and control groups, the mean learning scores of each group are presented in the form of a chart (Chart 1).

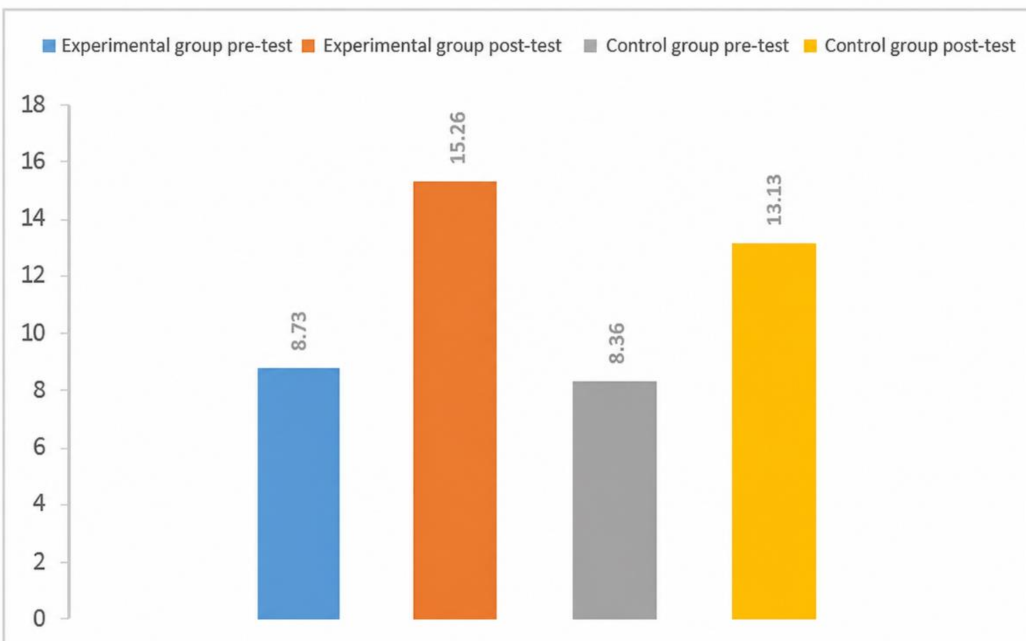

Chart 1. Descriptive Indicators of the Learning Variable by Group

The descriptive indicators, including the mean, standard deviation, and number, for the pretest and posttest of the academic achievement motivation questionnaire for the experimental and control groups are presented in the following table (Table 3).

Table 3. Descriptive Indicators of the Academic Achievement Motivation Variable by Group

Group		Minimum	Maximum	Mean	Standard Deviation	Number
Experimental	Pre-test	52	77	63.6	6.83	30
	Post-test	56	80	76.46	7.65	30
Control	Pre-test	54	75	63.2	5.35	30
	Post-test	57	77	65.13	4.68	30

To facilitate understanding the differences between the scores obtained from the pretest and posttest in each of the experimental and control groups, the mean scores of academic achievement motivation for each group are presented in the form of a chart (Chart 2).

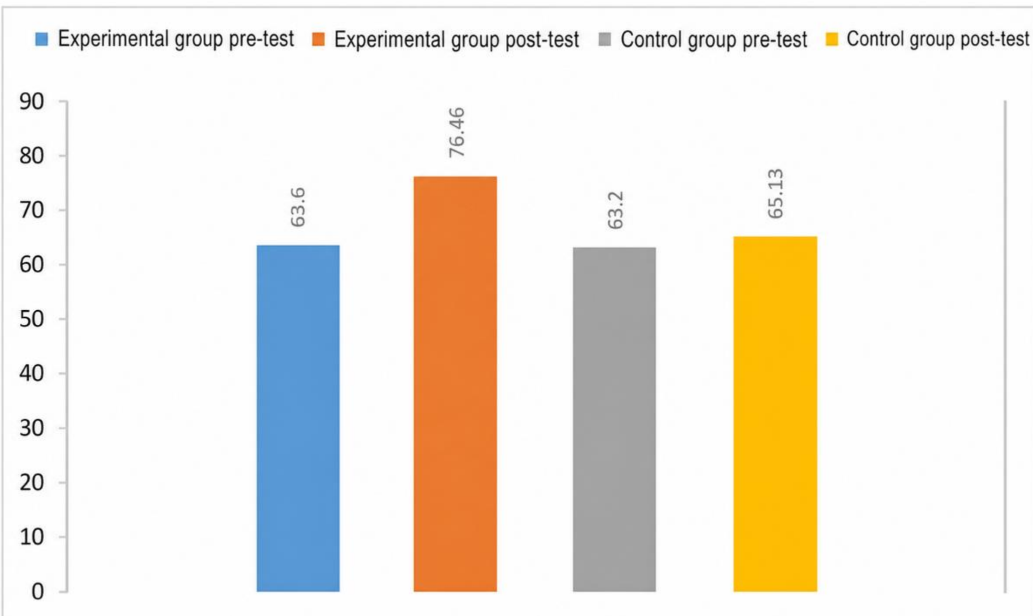

Chart 2. Descriptive Indicators of the Academic Achievement Motivation Variable by Group

By comparing the obtained means of the pretest and posttest scores of the academic achievement motivation variable in the experimental and control groups, it can be implicitly concluded that the academic achievement motivation of students in the experimental group, who were trained using the educational simulation software, increased in the posttest compared with the control group.

- Inferential Statistical Findings

In this section, the analysis of covariance test and the t-test were used to examine the research hypotheses.

The reason for using the analysis of covariance test is related to the fact that, in the present research design, the researcher used the pretest as a control variable to control the effect of prior readiness and adjust the effect of this variable. Before using the analysis of covariance test, some important assumptions of this statistical test, including the normality of data distribution, the assumption of equality of error variances, and the homogeneity of regression slopes, should be examined, because failure to meet these assumptions may lead to biased research results.

Initially, before examining the research hypotheses, the assumptions of the analysis of covariance were assessed using the analysis of covariance procedure through statistical data analysis software, and the results were obtained as follows.

- Assumptions of Analysis of Covariance

a) Normality of Data Related to the Interval Variable

According to Table (4), which presents the results of the Kolmogorov–Smirnov nonparametric test for the pretest and posttest data of the two groups regarding the two variables of learning and academic achievement motivation, it was observed that the significance levels (Sig.) for the pretest and posttest data of the learning variable were 0.185 and 0.054, respectively. Moreover, the significance levels for the pretest and posttest data of academic achievement motivation in the two groups were 0.060 and 0.200, respectively. These values were not statistically significant at the 0.05 level; therefore, there was no statistically significant difference between the distributions of these variables and the normal distribution. Consequently, the distribution of the dependent variables corresponds to and follows the normal distribution.

Table 4. Kolmogorov–Smirnov Nonparametric Test for the Pretest and Posttest Data of the Two Groups

Variable	Group	Statistic	Degrees of Freedom	Significance
Learning Achievement Pre-test	Experimental	0.133	29	0.185
Learning Achievement Post-test	Experimental	0.170	29	0.054
Learning Achievement Pre-test	Control	0.188	29	0.145
Learning Achievement Post-test	Control	0.122	29	0.175
Achievement Motivation Pre-test	Control	0.177	29	0.060
Achievement Motivation Post-test	Control	0.098	29	0.200
Achievement Motivation Pre-test	Experimental	0.145	29	0.080
Achievement Motivation Post-test	Experimental	0.127	29	0.115

According to Table (4), the Kolmogorov–Smirnov test for examining the normality of the pretest and posttest scores of the learning variable and the academic achievement motivation variable in the control and experimental groups was confirmed with a significance level higher than 0.05.

b) Homogeneity of Variances

According to the one-way analysis of variance output, the Levene’s test statistics for the pretest and posttest scores of learning were (0.005) and (0.143), respectively, and for the pretest and posttest scores of academic achievement motivation were (0.942) and (3.862), respectively. Accordingly, the results were not statistically significant at the 0.05 level; therefore, the assumption of homogeneity of variances for the dependent variables was met (Table 5).

Table 5. Results of Levene's Test for the Pretest and Posttest Scores of Learning and Motivation

Test	Statistic	Degrees of Freedom 1	Degrees of Freedom 2	Significance Level
Learning Achievement Pre-test	0.005	1	58	0.945
Learning Achievement Post-test	0.143	1	58	0.707
Achievement Motivation Pre-test	0.942	1	58	0.336
Achievement Motivation Post-test	3.862	1	58	0.054

c) Homogeneity of Regression Slopes

According to Table (6), which presents the results of the Pearson correlation test, it can be observed that the significance level regarding the correlation between the dependent variables in the pretest and posttest is higher than 0.05. Therefore, there is no significant relationship between the variables in the pretest and posttest. Furthermore, based on the correlation coefficients among the variables, it can be observed that these values are lower than 0.30, indicating a very weak correlation. Consequently, no multicollinearity is observed, and the analysis of covariance (ANCOVA) can be applied.

Table 6. Results of the Pearson Test for Examining the Correlation Level of the Dependent Variables in the Pretest and Posttest

Test		Learning Achievement Pre-test	Learning Achievement Post-test	Achievement Motivation Pre-test	Achievement Motivation Post-test
Learning Achievement Pre-test	Correlation	1	0.269	-0.169	0.143
	Significance		0.151	0.372	0.452
Learning Achievement Post-test	Correlation	0.269	1	-0.079	-0.006
	Significance	0.151		0.678	0.975
Achievement Motivation Pre-test	Correlation	-0.169	-0.079	1	0.018
	Significance	0.372	0.678		0.927
Achievement Motivation Post-test	Correlation	0.143	-0.006	0.018	1
	Significance	0.452	0.975	0.927	

d) Reliability of the Questionnaire and Researcher-Made Test

Hermans (1970) calculated a reliability coefficient of 0.84 for the questionnaire using Cronbach's alpha test. To examine the reliability of the researcher-made test, the

Kuder–Richardson method was used. The obtained reliability coefficient for the test was 0.75, which is an acceptable value considering the number of items. This value indicates that the test items have a significant internal correlation with the test, and the test has sufficient accuracy for measurement. Therefore, it can be stated that the assumption of test reliability for conducting covariance analysis was established (Table 7).

Table 7. Reliability Coefficients of the Tests

Test	Number of Items	Reliability Coefficient (Method)
Learning	20	Kuder–Richardson (0.75)
Academic Achievement Motivation	29	Cronbach's Alpha (0.84)

- Results of the Analysis of Covariance

Considering the set of aforementioned assumptions, it is observed that the data of this study have the required characteristics for entering the analysis of covariance (ANCOVA). Therefore, the results of the covariance analysis are examined in relation to each of the research hypotheses.

First Hypothesis: The use of an educational simulator in the science course in smart schools has an effect on learners' learning level.

Table 8. Results of the Analysis of Covariance for Students' Learning Posttest Scores After Adjusting for the Pretest

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Value	Significance Level
Corrected Model	80.878	2	40.439	4.247	0.019
Intercept	107.916	1	107.916	11.474	0.000
Pre-test	12.612	1	12.612	6.534	0.020
Group (Independent Variable)	64.445	1	64.445	6.768	0.012
Error	542.722	57	9.521		
Total	12722.000	60			

According to Table (8), the effect of the covariate variable is ($F = 6.534$), and this value of F is statistically significant at the 0.05 level (0.02). Therefore, it can be stated that the assumption of correlation between the covariate and independent variables has been met.

On the other hand, according to the table, the F value of the independent variable is 6.768, which is significant under the condition of ($df = 1$ and $p < 0.05$). This indicates that after removing the effect of the pretest, there is a significant difference between the mean scores of the two groups (the group trained using the educational simulation software and the group trained using the conventional method) in the posttest of learning the "Wonders of Plants" lesson. Therefore, the null hypothesis stating that there is no significant difference between the mean scores of the two groups in the posttest after eliminating the possible effect of the pretest is rejected.

Accordingly, the difference in learning levels between the control and experimental groups is confirmed at a significance level of 0.05, with 1 degree of freedom and 95% confidence. In other words, there is a significant difference between the learning levels of the control and experimental groups after removing the possible effect of the pretest. It can be concluded that the learning level of the experimental group was significantly higher compared with the control group.

Second Hypothesis: The use of an educational simulator in the science course in smart schools has an effect on learners' academic achievement motivation.

Table 9. Results of Analysis of Covariance of Students' Post-test Scores of Achievement Motivation after Adjusting for the Pre-test

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Value	Significance Level
Corrected Model	266.211	2	133.106	7.144	0.002
Intercept	1209.491	1	1209.491	64.918	0.000
Pre-test	145.795	1	145.795	7.825	0.007
Group (Independent Variable)	129.211	1	129.211	6.935	0.011
Error	1061.972	57	18.631		
Total	244917.000	59			

According to Table (9), the effect of the covariate variable is ($f = 7.825$); this value of f is significant at the 0.05 level (0.007). Based on this, it can be stated that the assumption of the correlation between the covariate and independent variables has been met.

On the other hand, according to the table, the f value of the independent variable is 6.935, which is significant under the condition ($df = 1$ and $p<0.05$). This means that after removing the effect of the pre-test, there is a significant difference between the mean scores of the two groups (the group trained using the simulation software and the group trained through the conventional method) in the motivation post-test. Therefore, the null hypothesis regarding the non-significance of the difference between the mean scores of the two groups in the post-test after eliminating the possible effect of the pre-test is rejected.

Therefore, the difference in the level of motivation between the control and experimental groups is confirmed at the significance level of 0.05, with 1 degree of freedom and 95% confidence. In other words, after removing the possible effect of the pre-test, there is a significant difference between the achievement motivation levels of the control group and the experimental group. It can be stated that the motivation level of the experimental group was significantly higher compared with the control group.

To confirm and expand the presented findings in this section, the t-test was used, and its results are presented in this section.

First hypothesis: The use of educational simulation in the science course of smart schools affects learners' level of learning.

According to Table (10), which is the result of the t-test, it can be stated that the difference between learners' mean scores in the learning pre-test and post-test is equal to 6.53, meaning that learners' learning in the learning post-test has increased by 6.53 compared to the pre-test. Therefore, according to Table (4-10), with 29 degrees of freedom, 95% confidence, and a significance level of 0.000, it can be stated that there is a significant difference between learners' learning in the learning pre-test and post-test. In fact, learners' learning in the experimental group increased significantly after the intervention.

According to Table (10), it can be observed that the difference between the pre-test and post-test of the control group in the learning variable is 4.76. Accordingly, it can be stated that in the learning variable, the performance of the experimental group, which was trained using educational simulation software, was considerably better than the control group, which received training through the conventional school method.

Table 10. Results of the t-test for the pre-test and post-test of the learning variable in the two groups

Group	t	df	Mean	Significance Level
Experimental	10.39	29	6.53	0.000
Control	5.85	29	4.76	0.000

Hypothesis 2: The use of educational simulation in the experimental science course of smart schools affects learners' academic achievement motivation.

According to Table (11), which presents the results of the (t)-test, it can be stated that the difference between learners' mean scores in the pre-test and post-test of academic achievement motivation is equal to 12.86, meaning that learners' motivation in the academic achievement motivation post-test increased by 12.86 compared with the pre-test. Therefore, according to Table (11), with 29 degrees of freedom, 95% confidence level, and a significance level of 0.000, it can be stated that there is a significant difference between learners' scores in the pre-test and post-test of academic achievement motivation. In fact, learners' motivation in the experimental group increased significantly after the intervention.

According to Table (11), it can be observed that the difference between the pre-test and post-test scores of the control group in the variable of academic achievement motivation is 1.93. Accordingly, it can be stated that in the variable of academic achievement motivation, the level of motivation in the experimental group, who were taught using educational simulation software, increased compared with the control group, who received instruction through the conventional school method.

Table 11. Results of the t-test for the pre-test and post-test of the academic achievement motivation variable in the two groups

Group	t	df	Mean	Significance Level
Experimental	6.93	29	12.86	0.000
Control	2.88	29	1.93	0.007

Discussion and Conclusion

In the past two decades, the development of information and communication technology (ICT) has brought about remarkable transformations in all dimensions of human life, particularly in the field of education. Educational simulation software is one aspect of these technologies that has become one of the most important learning resources for children, adolescents, young adults, and even adults in the modern era. The present study aimed to investigate the effect of a researcher-developed educational simulation software for the science course on the level of learning and academic achievement motivation of students. The findings of the study indicate that one of the most important factors affecting students' learning and academic achievement motivation is the method of teaching and the way educational content is presented. Educational simulations, through the explicit and comprehensible explanation of instructional objectives, presenting lessons within an organized framework and pattern, activating students' roles in the learning process, applying concepts to everyday life, and connecting the presented materials with prior knowledge, improve the quality of teaching and instruction and consequently increase students' learning. This factor can also be effective in enhancing learners' motivation for knowing and purposeful learning. The findings of the present study regarding the effect of computer-based instruction, particularly educational software, on effective learning and motivation are consistent with the studies conducted by *Farhoomand (2021)*, *Maghami et al. (2020)*, *Sabbagh Hasanzadeh and farzadpor (2023)* and *Li et al. (2024)*. In explaining these findings, it can be stated that computer-based instruction, compared with traditional (teacher-centered) instruction, has advantages such as providing immediate feedback, avoiding subjective judgments and biases, facilitating the process of individualized instruction, increasing learners' attention span and motivation, promoting diverse learning experiences, matching instruction with learners' abilities, and creating a motivating learning environment away from unhealthy competition. On the other hand, considering that an effective teaching-learning process should stimulate mental engagement and create a sense of enjoyment that moves students from the passive role of information receivers toward the active role of knowledge producers, engaging learners in this process can be challenging for teachers. Educational simulation software is an effective instructional tool for involving students in the learning process. Educational simulation software provides conditions in which the content, in addition to stimulating students' sensory systems through images, colors, sounds, and movement, can also be challenging and engaging. Considering the results of the presented studies, it is expected that teachers adopt a new perspective toward computer-based instructional methods, particularly the opportunity to use educational simulation software. Through a positive attitude toward the application of computers and software in the teaching and learning process, learners can be prepared to enter today's complex world by benefiting from this approach and the opportunities it provides. Therefore, considering the importance of this issue and based on the findings of the study, it is suggested that in-service training courses be organized for teachers at all educational levels to enhance their skills in working with computers, using simulation software, and participating in workshops for designing and producing educational software, particularly in smart schools. Furthermore, teachers who use innovative methods, such as educational simulations in their teaching process, or who independently produce electronic educational content, should be appropriately encouraged and supported. Necessary investments should be made for the development and production of high-quality simulation software, while observing technical and educational principles and standards, for all subjects and topics at all educational levels. Finally, by equipping schools with computer laboratories, suitable conditions should be provided for teachers and students to benefit from the countless advantages of the world of technology.

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