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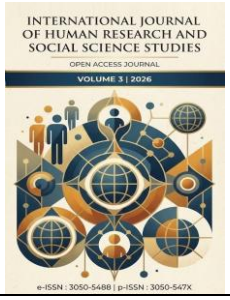

The Role of E-Learning in Improving the Quality of Higher Education: Case Study: University of Science and Technology

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ABSTRACT: The study aimed to identify the role of e-learning in improving the quality of education at University of Science and Technology - Hadhramout. To achieve the study objectives, the descriptive analytical approach was used, in addition to the (SPSS v25) program to analyze the study data, relying on the questionnaire as a tool for data collection. The study community included all faculty members at University of Science and Technology - Hadhramout, and the number of community members reached (80) academics. Due to the small size of the community, it was decided to conduct a comprehensive survey of all members of the study community, where (80) questionnaires were distributed, and the response rate was (96%), thus the sample became (74) individuals. The study reached a set of results, the most important of which are: There is a statistically significant effect between e-learning and improving the quality of education at University of Science and Technology - Hadhramout in all its dimensions, individually and collectively. The technical skills dimension was the most influential among the dimensions. The study recommended the necessity of investing in the University of Science and Technology in improving and developing the technological infrastructure to ensure the provision of e-learning systems in an effective manner that supports the needs of all students and faculty members. The study also recommended the necessity of increasing the university's interest in improving and developing study methods by using modern methods to enhance the educational process as a teaching tool that allows the university to proceed according to studied practical steps that guarantee improving the quality of education. The university's importance in testing and evaluation is achieved by setting clear and measurable criteria for developing and evaluating tests through a competent team, and by addressing errors immediately and benefiting from feedback. The study also recommended the necessity of focusing on technical skills through training courses and workshops. The study also recommended the necessity of exerting diligent efforts and giving greater attention to improving the quality of education by providing a suitable educational environment such as devices and the internet.

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1-INTRODUCTION

E-learning has many advantages, including saving time and effort, providing a diverse learning environment with alternatives and options, encouraging self-learning, and enabling learning outside educational institutions without being bound by time and place. In addition, e-learning contributes to achieving quality standards in the educational process (Sulaiman and Al-Jubouri, 2020). The world today is witnessing radical changes and developments affecting all aspects of life, whether in developing or developed countries that have made significant strides in developing their educational systems. In this context, education forms the basis for building any academic strategy that can achieve economic and social well-being for any country, especially when it comes to

university education, given its direct link to social and economic realities through its graduates. Therefore, it is necessary to explore ways to develop this field, both in terms of curricula and methods used in university education, as well as the tools used to facilitate it. From this perspective, and in light of modern technological developments and the emergence of what is called e-learning as a modern and civilized practice of university education, the need has arisen to employ its various tools in order to ensure the quality of education in universities (Murad and Munir, 2018). n this context, Ghattas (2019) pointed out that improving and developing the quality of university education depends primarily on the quality of the elements that constitute the educational process, which include students, faculty members, curricula, and the university administration with its departments and colleges. It is well-established that improving the quality of education requires identifying and reinforcing the strengths of these elements, and uncovering the weaknesses that hinder their development and working to minimize them as much as possible. Therefore, the quality of education has received considerable attention from university administrations, as it is considered an administrative process aimed at utilizing educational elements to achieve the university's mission and desired goals, and to improve the level of services provided (Abdul Qader & Mustafa, 2019). Al-Hashemiya (2014) indicated that introducing 21st-century innovations into university education clearly contributes to improving and developing the elements of the educational process, as employing modern innovations is a defining characteristic of the current era in the education system. From this perspective, universities have recognized the need to adopt a developmental vision that aligns with modern educational trends to accelerate the pace of the education system and enable it to meet the demands of the knowledge economy. This necessitates employing modern technologies and innovating diverse teaching methods, as well as responding quickly to technological developments that have brought about fundamental changes in teaching methods and strategies (Saada & Al-Sartawi, 2013).

E-learning constitutes an effective management that, through its practice and various mechanisms, enables the improvement of the educational process in the university and the enhancement of the quality of services provided by it. It is considered the ultimate goal of the higher education quality assurance system (Murad and Munir, 2018).

The growing interest of universities in e-learning plays a significant role in enhancing the quality of university education. Studies, such as Ahmed's (2019), have shown that using modern technology in education is a method that supports the educational process and transforms it from a traditional approach to one of creativity, interaction, and skills development. Furthermore, Al-Olayan (2019) emphasizes that leveraging digital advancements opens new horizons for education and teaching, contributing to improving the university's reputation and enhancing the learning experience for both students and faculty members.

Hence, this study seeks to understand the role of e-learning in improving the quality of education at the University of Science and Technology.

2- PROBLEM OF THE STUDY

This study comes at a time when Yemeni universities, including the University of Science and Technology, are increasingly focused on e-learning and distance education. Distance learning is a relatively new and pioneering experience in Yemen in general, and particularly within Yemeni universities. Its importance lies in the need for a comprehensive study and evaluation to help stakeholders understand its success and identify its strengths and weaknesses. Suleiman and Al-Jabouri (2020) emphasized that higher education institutions face significant challenges due to several problems and difficulties that hinder the implementation of quality standards in educational systems. These include a poor learning environment and a lack of electronic data, leading to a decline in the quality of educational outcomes and their mismatch with labor market needs, in addition to the high cost of education. The quality of university education constitutes a crucial area for ongoing research aimed at establishing a global system based on knowledge and modern technologies. This system seeks to improve the efficiency of university education by enhancing the quality of its outputs and monitoring them using various standards and systems, through the adoption of e-learning and modern technologies in the university education field.

This is confirmed by several previous studies, such as those by Ghatas (2019), Boubaker (2019), and Nagasubramani & Raja (2018), which demonstrated several challenges to the use of modern educational technologies in university education. These challenges include: insufficient equipment, inadequate infrastructure to support the integration of these technologies in universities, a high student-to-teacher ratio, overcrowded classrooms, heavy teaching loads for professors, dense course content in the curriculum, negative attitudes among students and professors towards the use of these technologies, and frequent technical malfunctions. The research problem can be formulated in the following main question: What is the role of e-learning in improving the quality of education at the University of Science and Technology - Hadramout?

3- STUDY QUESTIONS

The first main question: What is the impact of e-learning on improving the quality of education at the University of Science and Technology - Hadhramaut? The following sub-questions stem from this main question:

1- What is the impact of teaching methods on improving the quality of education at the University of Science and Technology – Hadhramaut?

2- What is the impact of tests and assessments on improving the quality of education at the University of Science and Technology – Hadhramaut?
3- What is the impact of technical skills on improving the quality of education at the University of Science and Technology – Hadhramaut?

4- STUDY OBJECTIVES:

The first main objective is to determine the impact of e-learning on improving the quality of education at the University of Science and Technology - Hadhramaut. The following sub-objectives stem from this main objective:
1- To determine the impact of teaching methods on improving the quality of education at the University of Science and Technology – Hadhramaut.
2- To determine the impact of tests and assessments on improving the quality of education at the University of Science and Technology – Hadhramaut.
3- To determine the impact of technical skills on improving the quality of education at the University of Science and Technology – Hadhramaut.

5- STUDY HYPOTHESES:

First Main Hypothesis: There is a statistically significant effect at the (0.05) level of e-learning on improving the quality of education at the University of Science and Technology - Hadhramaut. The following sub-hypotheses stem from the first main hypothesis:
1- There is a statistically significant effect at the (0.05) level of teaching methods on improving the quality of education at the University of Science and Technology – Hadhramaut.
2- There is a statistically significant effect at the (0.05) level of testing and assessment on improving the quality of education at the University of Science and Technology – Hadhramaut.
3- There is a statistically significant effect at the (0.05) level of technological skills on improving the quality of education at the University of Science and Technology – Hadhramaut.

6- STUDY MODEL

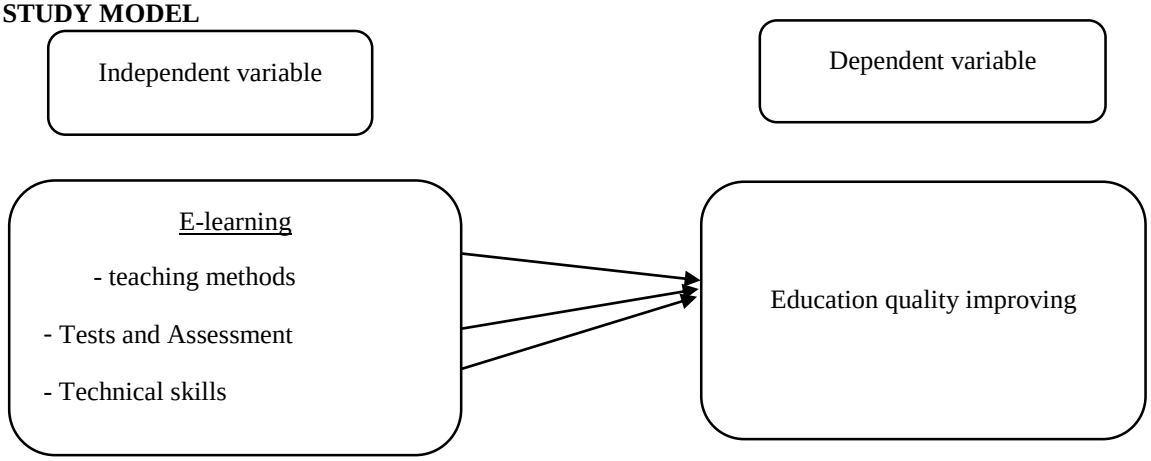

Figure (1) illustrates the study model.
Source: Prepared by the researchers based on previous studies.

7- SIGNIFICANCE OF STUDY:

- Scientific Significance:

The scientific significance of this study lies in the theoretical literature and information it will provide regarding e-learning and its role in improving the quality of education. This will benefit other researchers.

This study will assist researchers and students by serving as a reference for the theoretical and metric aspects of e-learning, which will aid them in conducting further studies related to e-learning.

The theoretical significance of the study is also evident in the importance of the topic it addresses: the role of e-learning in improving the quality of education. This provides insights into developing education through innovative methods, which may benefit those working at the University of Science and Technology.

- Practical Significance:

The importance of this study is highlighted by the need for a comprehensive study and evaluation that helps stakeholders understand and identify the strengths and weaknesses of the educational process. This study can also assist decision-makers in taking the necessary steps to improve the quality of education and overcome the difficulties and challenges it faces, with the aim of achieving its objectives.

8- THEORETICAL FRAMEWORK

-The Concept of E-Learning:

E-learning is considered part of the new dynamic characterizing educational systems at the beginning of the 21st century, and its concept is constantly evolving. Furthermore, it is difficult to arrive at a single definition of e-learning that is widely accepted by the scientific community. Different concepts of e-learning vary according to specific curricula and professional interests. E-learning can also be seen as a natural evolution for distance learners, enabling them to continuously benefit from the latest tools that have emerged in the context of educational structuring technologies. In fact, some authors consider e-learning to be a new generation of education (Al-Mabrouk & Al-Masrati, 2020).

E-learning refers to the process of learning and receiving information that takes place through the use of electronic devices and multimedia technology innovations, regardless of time and place, where communication between the learner and the teacher takes place through various means of communication in which technology plays a major role (Harnan and Hajal, 2020).

Based on the preceding definitions, the researchers can operationally define e-learning as a method of learning where the teacher connects with the learner using modern technology at the University of Science and Technology.

Teaching Methods: Teaching methods in e-learning are diverse, allowing teachers to use a variety of strategies to enhance the learning experience. These methods include the flipped classroom, e-projects, digital storytelling, virtual field trips, programmed learning, and discussions (Zaman, 2024).

Tests and Assessment: These focus on objective and essay questions, case studies, and providing necessary support to learners. Learners can receive their exam results directly (feedback), and an online survey is conducted after a period to confirm the benefits gained from e-learning, reduce obstacles, and motivate newcomers to progress and succeed (Harnan & Hajjal, 2020).

Technical Skills: These are the ability to perform tasks related to technical roles such as information technology, engineering, or mechanics. They rely primarily on technology, requiring students to master the tools used in e-learning, such as Learning Management Systems (LMS), virtual collaboration tools, and word processing and presentation software (Taysir, 2023). Hassan (2019) defines technical skills as organized performance behavior consisting of two sets of interconnected steps and procedures related to technological means and tools, which individuals acquire through continuous training on the components of these technologies.

From the above, the researchers can define technical skills operationally as a set of tools related to computers and working with speed, accuracy, and high efficiency. These skills can be acquired through experience, practice, and training.

Quality: This is a set of characteristics or features of a particular product or service that demonstrate its ability to meet various needs (Al-Titi, 2010).

Quality standards, on the other hand, are a set of specific measures for comparison and evaluation. They are used to set and assess performance goals and may reflect the current levels of achievement within an institution. These standards may also be levels set by an external body or the institution's own performance levels (Jordanian Higher Education Accreditation Commission Publications, 2015).

Quality of Education: This is the value, quantitative extent, or level of an educational institution or program compared to generally accepted standards for educational institutions or programs (Qatar Deanship of Quality Assurance and Academic Accreditation Publications, 2014). Based on the above, the researchers can define quality operationally as a measure of excellence or a state free from defects, shortcomings, and significant variations through adherence to measurable standards that meet customer needs. Researchers can also define the quality of education operationally as: a system followed to develop education at the University of Science and Technology based on several principles that facilitate the smooth running of the educational process, benefiting students and faculty members.

9- PREVIOUS STUDIES

- Murad and Munir's study (2018), "The Impact of Using E-Learning as a Tool to Improve the Quality System of Higher Education in Algeria,"

The study aimed to determine the impact of using e-learning as a tool to improve the quality system of higher education at the University of M'sila in Algeria. The descriptive approach was used, and the study population consisted of faculty members at the university. A simple random sampling method was used to select a sample of 56 faculty members. The most important finding was that e-learning has an impact on improving the quality system of education. One of the most important recommendations of the study was the need to provide the necessary infrastructure to facilitate the expansion of e-learning at the university.

- Al-Rashidi's study (2018). The impact of e-learning on improving self-learning skills among students of educational technology and communication at the University of Hail, Saudi Arabia.

The study aimed to identify the impact of e-learning on improving self-learning skills among students of Educational Technology and Communication at the University of Hail. The study population consisted of students of Educational Technology and Communication, and the sample comprised (60) male and female students. The study used random sampling. The results indicated

a statistically significant impact of teaching using e-learning on improving self-learning skills. The study also concluded with a set of recommendations, the most important of which is activating the use of the e-learning system in the educational process.

- Sulaiman and Al-Jubouri's study (2020). The Role of E-Learning in Promoting Total Quality Management in Educational Institutions, Iraq.

The study aimed to determine the role of e-learning in enhancing Total Quality Management (TQM) in educational institutions in Nineveh Governorate, Iraq. The study population consisted of employees and administrators from the Nineveh Governorate Education Directorate. The researchers distributed 30 questionnaires to these employees and administrators. The study concluded that e-learning offers several advantages, including saving time and effort and providing a diverse learning environment with various alternatives and options. The results also demonstrated a significant correlation and influence between e-learning and TQM.

- Mabrouk and Al-Masrati study (2020). The Role of E-Learning in improving the quality of higher education,

Libya.

This study presents a theoretical framework on the concept of e-learning in all its aspects and the most important strategies adopted for its implementation in higher education institutions, as well as its contribution to improving the quality of higher education. The study employs an inductive and deductive approach, reviewing some leading international and Arab experiences in this field to assess their effectiveness and potential applicability in Libyan institutions. Finally, the study concludes that e-learning plays a significant role in enhancing the quality of the educational process, despite the weak response of higher education institutions to this mode of education and their continued reliance on traditional teaching methods. The study also recommends the enactment of regulations and laws to integrate this technology into the educational process, as well as providing the necessary infrastructure for e-learning, such as training qualified personnel and supporting all educational and training institutions with diverse teaching media and technologies to disseminate technological literacy and create an online society capable of engaging with all modern technologies.

- Al-Subaie's study (2023 "The Impact of Using E-Learning Systems on Improving the Quality of Education in Saudi Universities".

This study aimed to investigate the impact of using e-learning systems on improving the quality of education in Saudi universities from the perspective of faculty members. To achieve this objective, a descriptive-analytical approach was employed, utilizing e-learning systems as the research instrument and quality improvement standards applied to 130 faculty members across Saudi universities. The results showed that the level of e-learning system usage in Saudi universities, as perceived by faculty members, was high. The results also indicated that the level of quality improvement standards in Saudi universities, from the faculty members' perspective, was also high. Faculty performance ranked first, followed by course performance, then university administration standards, while student performance ranked last. Furthermore, the results demonstrated a statistically significant impact of using e-learning systems on improving the quality of education, encompassing student performance, course performance, faculty performance, and university administration. However, the results also showed no statistically significant differences in faculty members' average ratings based on gender, academic rank, or years of service. The study recommended that Saudi universities invest in improving and developing the technological infrastructure to ensure that e-learning systems are provided effectively and supportively to the needs of all students and faculty members.

10 - DISTINGUISHES THIS STUDY

Previous studies have focused on e-learning and its role in various variables, including improving the quality of education in Arab countries such as Egypt, Saudi Arabia, and Algeria. However, to the researchers' knowledge, no study has addressed the role of e-learning in improving the quality of education in Yemeni universities in general, and the University of Science and Technology in particular. The current study is distinguished by being conducted at the University of Science and Technology, which is considered one of the most prestigious universities.

11- STUDY METHODOLOGY

The study used the descriptive analytical method, as it is considered a suitable and appropriate method for this study.

- Study population:

The study population consisted of (80) faculty members from the University of Science and Technology, Hadramout.

- The study sample:

The study sample consisted of (80) faculty members from the University of Science and Technology, Hadramout. A comprehensive census sample was used due to the small size of the population.

Table (1): Valid Study Sample for Analysis

		Distributed	Suitable for analysis	Not suitable for analysis[1]
Total	80	74		6
Ratio	%100	%96		%4

- Reliability and validity test:

To determine the suitability of the questionnaire for its objectives, we used Cronbach's alpha to assess the reliability of the questionnaire items. The following table shows the reliability test results.

Tabel (2) shows alpha Cronbach for study.

Variables	Variable Dimensions	Number of Items	Cronbach's Alpha	Result
Independent variable	Teaching methods	5	0.672	Acceptable stability
	Exams and assessment	5	0.876	High stability
	Technical skills	5	0.857	High stability
E-learning		15	0.902	Very high stability
Improving the quality of education		5	0.888	Very high stability
Total variables		20	0.938	Very high stability

Source: Prepared by the researchers based on the results of the SPSS.

The table above shows that the reliability values for the study axes for the independent variable (e-learning) ranged between (0.672 – 0.876), and the value of the overall reliability coefficient for the independent variable was (0.902), which is a very high value, and the value of the overall reliability coefficient for the dependent variable was (0.888), which is a very high value. It is noted from the table that the value of Cronbach's alpha for all study axes is (0.938), and these are indicators that indicate that the research instrument in general enjoys a very high reliability coefficient and its ability to achieve the research objectives.

- The internal consistency validity:

The internal consistency validity of the research instrument was extracted through Pearson's correlation coefficient between each axis of the questionnaire and its total score for each sample at a significance level of (0.01). The following table shows those coefficients.

Table (3) shows the results of the internal consistency validity test.

Variable Dimensions	Number of Items	Correlation coefficient	Result
Teaching methods	5	0.539**	Significance
Exams and assessment	5	0.655**	Significance
Technical skills	5	0.749**	Significance

Source: Prepared by the researchers based on the results of the SPSS.

** This means there is statistical significance at a significance level of (0.01).

Table (3) shows that all correlation coefficients are statistically significant at the significance level of (0.01), indicating that the research instrument has a high degree of validity, internal consistency, and coherence between its axes, and can be relied upon to reach and trust the results.

- Normality test:

To determine whether the data follows a normal distribution, the Kolmogorov-Smirnov test was used because parametric tests, including the One-Sample Test, require a normal distribution. The following table shows the results of this test.

Table (4) shows the normality test for the data

Variables	Variable Dimensions	Number of Items	Value Probability	Result
Independent variable	Teaching methods	5	0.179	Normal distribution
	Exams and assessment	5	0.178	Normal distribution
	Technical skills	5	0.158	Normal distribution
E-learning		15	0.125	Normal distribution
Dependent variable	Improving the quality of education	5	0.120	Normal distribution
Total variables		20	0.103	Normal distribution

Source: Prepared by the researchers based on the results of the SPSS.

Looking at Table (4), the results of the Kilmogrove-Simneroff test for the type of data distribution show that the probability value of the independent variables ranges between (0.158 - 0.179), and the probability value of the dependent variable was (0.120), all of which are at a significance level of ($\alpha \geq 0.05$). Also, the probability value of all axes is equal to (0.103), which is greater than (0.05). Therefore, the data are normally distributed, and thus, parametric tests can be used, and a One-Sample Test can be performed.

12- RESULTS ANALYSIS

Before testing the hypotheses, two essential conditions must be verified for applying regression analysis: the normality of the data (skewness) of the independent variables (dimensions of e-learning) and the verification of the absence of linear correlations between the independent variables included in the multiple regression model. The following table shows the results of this analysis:

Table (5) Skewness coefficient and results of the Variance Inflation Coefficient (VIF) and Tolerance tests for the independent variables

Independent Variables	Skewness Coefficient	VIF	Allowable Variance
Teaching methods	-.632-	1.856	.539
Exams and assessment	-372.	1.824	.548
Technical skills	-.705-	1.571	.637

Source: Prepared by the researchers based on the results of the SPSS.

The results in Table (5) shows that the values of the skewness coefficient ranged between (0.372) for the Tests and Evaluation dimension and (0.705) for the Technical Skills dimension. These values represent acceptable normal skewness values in one direction, where it can be concluded that the data for the dimensions of e-learning are close to a normal distribution and are confined between the values (1+) and (1-). Regarding multicollinearity, no multicollinearity was found between the dimensions of the independent variable e-learning. This is confirmed by the Variance Inflation Coefficient (VIF) values for the dimensions (teaching methods, testing and assessment, and technical skills), which are (1.856, 1.824, and 1.571) respectively, and are less than (10). It is also evident that the tolerance values were (0.539, 0.548, and 0.637) respectively, all of which are greater than (0.05). This indicates the absence of a high correlation between the independent variables, and therefore the multicollinear regression model can be applied. The following are the results of the analysis to test the first main hypothesis and its sub-hypotheses:

- Testing the first main hypothesis:

- The first main hypothesis states the following:

H0: (There is a statistically significant effect at the 0.05 level of e-learning on improving the quality of education at Hadramout University of Science and Technology).

Table (6) Results of the Multiple Linear Regression Test for the Impact of E-learning dimensions in combined dimensions, on improving the quality of education.

N	Independent variables	Regression constant a	Regression coefficient b	Correlation coefficient R	Coefficient of determination R2	Value f calculated	Probability value (sig)
1	Teaching methods	1.31	0.22	0.61	0.37	24.17	0.000
2	Exams and assessment		0.01				
3	Technical skills		0.44				
Regression equation		$x_3 0.44\ x_2 + 0.01\ x_1 + 0.22 + 1.31 = y$					

Source: Prepared by the researchers based on the results of the SPSS.

Table (6) shows that the correlation coefficient, valued at (0.61), indicates a strong and positive relationship between e-learning and the improvement of the quality of education at the University of Science and Technology - Hadramout. The coefficient of determination, valued at (0.37), means that the e-learning variable contributes (37%) to improving the quality of education at the University of Science and Technology - Hadramout, while (63%) is attributed to other reasons and variables not under study (taking into account the impact of other dimensions on improving the quality of education simultaneously). According to this model, the independent dimensions (teaching methods, tests and assessment, and technical skills) contribute to improving the quality of education by (0.22, 0.01, and 0.44) respectively. This means that for every one-unit increase in the level of e-learning, there is a

corresponding increase in the improvement of the quality of education by (0.67), with a high degree of impact. The table also shows that the technical skills dimension had the greatest impact on the dependent variable (improving the quality of education). That is, the application of the technical skills dimension increases the level of improvement in the quality of education by (0.44), taking into account the impact of other dimensions on improving quality. The education at the same time, and the F-test indicates that the regression model is statistically significant with a value of (0.000), which is less than (0.05). Accordingly, we accept the first main hypothesis, which states, "There is a statistically significant effect at the level of (0.05) of e-learning in improving the quality of education at the University of Science and Technology, Hadramout," and we reject the alternative hypothesis, which states, "There is no statistically significant effect at the level of (0.05) of e-learning at the University of Science and Technology, Hadramout".

-Testing the first sub-hypothesis:

The first sub-hypothesis states the following:

H01: (There is a statistically significant effect of teaching methods on improving the quality of education at Hadramout University of Science and Technology).

Table (7) Simple regression analysis to test the effect of teaching methods on improving the quality of education.

Independent variables	Dependent variable	Correlation coefficient R	Coefficient of determination R2	Regression constant a	Regression coefficient b	Value f calculated	Probability value (sig)
Teaching methods	Improving the quality of education	0.56	0.31	1.70	0.57	56.15	0.000
Regression equation			$\boldsymbol{y} = 1.70+0.57\boldsymbol{x}$				

Source: Prepared by the researchers based on the results of the SPSS.

The table above shows that the correlation coefficient reached (0.56), which indicates a moderate correlation between teaching methods and improving the quality of education. That is, the more attention is paid to teaching methods, the higher the quality of education at the University of Science and Technology Hadramout. The coefficient of determination, valued at (0.31), indicates that teaching methods contribute (31%) to improving the quality of education at the Hadramout University of Science and Technology, while (69%) is attributed to other reasons and variables not under study (taking into account the stability of the other studied factors). The regression coefficient, valued at (0.57), indicates a moderate effect of the teaching methods dimension on improving the quality of education at the Hadramout University of Science and Technology. Each one-unit increase in the teaching methods score leads to a 57% increase in the improvement of the quality of education at the Hadramout University of Science and Technology. The F-test indicates that the regression model is statistically significant, with a value of (0.000), which is less than (0.05). Based on this result, we accept the first sub-hypothesis, which states: "There is a statistically significant effect of teaching methods on improving the quality of education at the Hadramout University of Science and Technology," and we reject the alternative hypothesis, which states: "There is no statistically significant effect of teaching methods on improving the quality of education at the Hadramout University of Science and Technology." The researchers explain this the result is that teaching methods that take into account and integrate technological development into the educational process push the university to the ranks of successful universities, as it works to determine the methods used in teaching and thus enables the university to be able to carry out its work, compete and take advantage of opportunities.

- Testing the second sub- hypothesis:

The second sub-hypothesis states the following:

H02: (There is a statistically significant effect of testing and evaluation on improving the quality of education at Hadramout University of Science and Technology).

Table (8) Simple regression analysis to test the impact of tests and assessments on improving the quality of education.

Independent variables	Dependent variable	Correlation coefficient R	Coefficient of determination R2	Regression constant a	Regression coefficient b	Value f calculated	Probability value (sig)
Exams and assessment	Improving the quality of education	0.41	0.16	2.27	0.41	24.72	0.000
Regression equation						$\boldsymbol{y} = 2.27+0.41\boldsymbol{x}$	

Source: Prepared by the researchers based on the results of the SPSS.

Table (8) shows that the value of the correlation coefficient was (0.41), which indicates a moderate correlation between tests and evaluation in improving the quality of education. The coefficient of determination was (0.16), which means that the dimension of tests and evaluation contributes (16%) to improving the quality of education at the University of Science and Technology - Hadramout, while (84%) is due to other reasons and variables not under study (taking into account the stability of the rest of the other studied factors). The regression coefficient, which was (0.41), indicates that there is an effect of the dimension of tests and evaluation in improving the quality of education at the University of Science and Technology - Hadramout, as every increase in the score of tests and evaluation by one unit leads to an increase in the improvement of the quality of education at the University of Science and Technology - Hadramout by (41%). The F-test indicates that the regression model is statistically significant at a value of (0.000), which is less than (0.05). Therefore, we accept the second sub-hypothesis, which states: "There is a statistically significant effect of testing and evaluation on improving the quality of education at Hadhramaut University of Science and Technology," and reject the alternative hypothesis, which states: "There is no statistically significant effect of testing and evaluation on improving the quality of education at Hadhramaut University of Science and Technology." The researchers explain this result by stating that testing and evaluation enable the university and its faculty members to gain a clear understanding of the educational process and teaching methods. Through testing and evaluation, the university can identify its strengths and capabilities, anticipate its competitive advantage, and recognize influential environmental forces and factors. This allows the university to develop its educational process and teaching methods, thereby enabling it to capitalize on opportunities that lead to improved quality of education.

- Testing the third sub-hypothesis:

The third main sub-hypothesis states the following:

H03: (There is a statistically significant effect of technical skills on improving the quality of education at Hadramout University of Science and Technology).

Table (9) Simple regression analysis to test the impact of technical skills on improving the quality of education.

Independent variables	Dependent variable	Correlation coefficient R	Coefficient of determination R2	Regression constant a	Regression coefficient b	Value f calculated	Probability value (sig)
Technical skills	Improving the quality of education	0.48	0.23	2.36	0.39	37.23	0.000
Regression equation			$\boldsymbol{y} = 2.36+0.39\boldsymbol{x}$				

Source: Prepared by the researchers based on the results of the SPSS.

Table (9) shows that the correlation coefficient was (0.48), indicating a moderate correlation between technical skills and the improvement of educational quality. The coefficient of determination was (0.23), meaning that the technical skills dimension contributes (23%) to improving educational quality at the University of Science and Technology, Hadramout, Yemen, while (77%) is attributed to other factors and variables not under study (assuming the stability of the other studied factors). The regression coefficient, which was (0.39), indicates a weak effect of the technical skills dimension on improving educational quality at the University of Science and Technology, Hadramout, Yemen. Each one-unit increase in the technical skills score leads to a (39%) improvement in educational quality at the University of Science and Technology, Hadramout, Yemen. The F-test indicates that the (0.05)regression model is statistically significant at (0.000), which is less than.

With this result, we accept the third sub-hypothesis, which states: "There is a statistically significant effect of technical skills on improving the quality of education at Hadhramaut University of Science and Technology," and reject the alternative hypothesis, which states: "There is no statistically significant effect of technical skills on improving the quality of education at Hadhramaut University of Science and Technology." The researchers explain this result by pointing to the role that technical skills play in enhancing the university's competitive position and enabling it to seize opportunities and meet challenges by directing efforts toward improving the quality of education.

13- DISCUSSION OF RESULTS

1- There is correlation between teaching methods and improving the quality of education at Hadramout University of Science and Technology.

2- There is correlation between tests and assessments and improving the quality of education at Hadramout University of Science and Technology.

3- There is a moderate correlation between technical skills and improving the quality of education at Hadramout University of Science and Technology.

14 - RECOMMENDATIONS

1- The University of Science and Technology needs to invest in improving and developing its technological infrastructure to ensure that e-learning systems are provided effectively and supportively to meet the needs of all students and faculty members.

2- The university is increasingly interested in improving and developing teaching methods by using modern methods to enhance the educational process as a teaching tool that allows the university to proceed according to well-thought-out practical steps that ensure the improvement of the quality of education.

3- The university needs to pay attention to tests and assessment by setting clear and measurable standards for setting and evaluating tests through a competent team, addressing errors immediately, and benefiting from feedback.

4- The need to pay attention to technical skills through training courses and workshops.

5- It is necessary to make diligent efforts and give greater attention to improving the quality of education by providing a suitable learning environment such as devices and the internet.

15- FUTURE STUDIES

1- Conduct a study on the role of e-learning in improving the quality of education in public universities.

2- Preparing a study on the impact of digital transformation on improving the quality of education.

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