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The Impact of Digital Entrepreneurship on the Quality of Education in Saudi Universities

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Abstract

The study aimed to demonstrate the impact of digital entrepreneurship in its dimensions (digital knowledge management, learning environment management, digital entrepreneurship skills) on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates). The study population was formed from Saudi universities, the questionnaire was adopted to collect data for the study, and a random sample of (384) individuals was taken, consisting of (professor doctor, associate professor, assistant professor, lecturer). The responding sample suitable for analysis reached (350) individuals, with a percentage of (91.14). %). The descriptive analytical approach was adopted, and the statistical package program (SPSS) was used to analyze the study data and obtain the results. The study concluded that the level of digital entrepreneurship was high and reached (4.02), and the level of education quality was high and reached (4.03). The coefficient of determination reached (R^2) (80.8%). The study recommended the need to motivate the university administration to increase awareness of the importance of digital entrepreneurship, and to diversify its methods in attracting qualified personnel and expertise that enhance its administrative orientations.

Keywords: *digital entrepreneurship, quality of education, Saudi universities, Saudi Arabia*

Introduction

The industrial revolution has recently been able to bring about rapid and effective changes in business management in general and in teaching methods in particular. This is the shift from traditional forms of carrying out tasks and activities to the digital form as a result of technology penetrating the education sector, which has become the foundation of the education sector (Al-Dhahabi, 2023). Teachers are also encouraged to master ICT, digital and technological competencies so that they do not face difficulties in implementing these changes to achieve transformation in education. School principals and teachers are required to use these skills to improve the academic performance of students, using digital technology methods. Principals who wish to implement digital entrepreneurship also need to use their space and opportunities wisely to achieve significant changes in school culture and thus have a positive impact on the education system (Hamzah et al., 2021). The most important standards of educational quality are that they

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take into consideration the achievement of oversight, transparency, accountability, and internationalization processes based on globalization. They are also concerned with developing and improving educational outcomes, enhancing the quality of teaching curricula, strategies used in teaching, extracurricular activities, and administrative practices, and providing advisory services, as well as providing opportunities to develop staff and teachers add distinct value to education and enhance its competitiveness(Abu Aisha, 2021).

Study problem and questions

As a result of increasing competition at the local and global levels and the emergence of various environmental changes, projects must respond to these changes in order to preserve, continue and grow through what is called digital entrepreneurship and adopting digital transformation in their activities because of the facilities it provides in completing work in new and innovative ways that suit the surrounding circumstances and challenges (Al-Saket, 2022). To facilitate the transfer of academic knowledge, teachers had to delve into an area of learning that some considered too complex. Meanwhile, school principals have had to take up the mantle of digital literacy by ensuring that teachers and learners have access to and use digital tools and platforms. Some managers are reluctant to improve their digital literacy skills and discover social media platforms that can facilitate effective knowledge transfer (Alajmi, 2022). Although the concept of quality in general and service quality in particular occupied a large space in management and education studies, many studies related to educational service quality have relied on standards designed for purposes other than those related to educational service, such as the Servqual scale, which is concerned with service quality, and the SERVPERF scale, which is concerned with measuring service performance. However, this scale was not designed to specifically take into account the details of the quality of the educational service. Therefore, the HEdPERF scale, which was developed specifically to measure the perceived quality of the educational service, is the most appropriate to measure the quality of the educational service perceived by the student (Khudair, 2021). The problem of the study can be summarized in the following main question: What is the impact of digital entrepreneurship in its dimensions (digital knowledge management, learning environment management, digital entrepreneurship skills) on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities?

The following questions branch out from this question.

1. What is the level of digital entrepreneurship in its dimensions (digital knowledge management, learning environment management, digital entrepreneurship skills) in Saudi universities?

2. What is the level of quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities?

3. What is the impact of digital knowledge management on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities?

4. What is the impact of managing the learning environment on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities?

5. What is the impact of digital entrepreneurship skills on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities?

Objectives of the study

The study aims to demonstrate digital entrepreneurship in its dimensions (digital knowledge management, education environment management, digital entrepreneurship skills) in the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities. The following sub-objectives are branched from the main objective:

Pinpointing the level of digital entrepreneurship in its dimensions (digital knowledge management, learning environment management, digital entrepreneurship skills) in Saudi universities

1. Statement of the level of quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

2. Explaining the impact of digital knowledge management on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

3. Explaining the impact of managing the learning environment on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

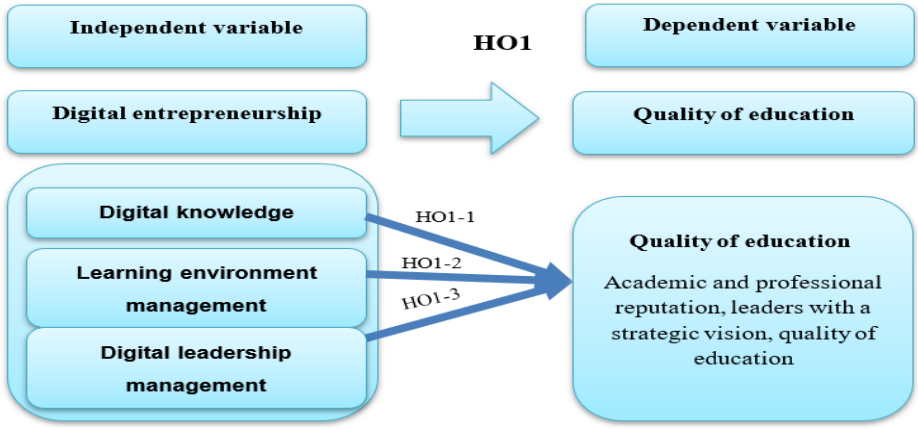
4. Explaining the impact of digital entrepreneurship skills on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

Importance of the study: The importance of the study is highlighted in two aspects:

Theoretical importance: Since digital entrepreneurship is considered of great importance to the quality of education and its users, it was necessary to focus on studying digital entrepreneurship, which is supposed to demonstrate digital knowledge management, management of the learning environment, and digital entrepreneurship skills honestly and fairly, away from manipulation. This

can be done by studying the impact of each of: Digital knowledge management, learning environment management, and digital entrepreneurship skills on the quality of education for Saudi universities, and therefore this study will be of first importance for Saudi universities as well as for all their users. Practical importance: This study contributes to consolidating research and studies related to the process of digital entrepreneurship and its dimensions, which achieve very important results in the field of quality education. Therefore, it is considered a continuation of the vision of digital entrepreneurship. It also works to reveal if there are deficiencies in the dimensions of digital entrepreneurship and the quality of education and work to find proposals to improve the efficiency and quality of digital knowledge management, management of the learning environment, and digital entrepreneurship skills from the perspective of each of the beneficiaries of digital entrepreneurship.

Study model and hypothese



Based on the questions of the study problem and its objectives, and based on the above, the hypothesis can be formulated to suit the variables of the study:

Main hypothesis (H01): There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital entrepreneurship in its dimensions (digital knowledge management, learning environment management, digital entrepreneurship skills) on the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, Quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

The following sub-hypotheses emerge from it:

The first sub-hypothesis ($H_{01\text{-}1}$): There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital knowledge management on the quality of education in the dimensions of (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

The second sub-hypothesis ($H_{01\text{-}2}$): There is no statistically significant effect at the significance

level ($\alpha \leq 0.05$) of managing the learning environment on the quality of education in the dimensions of (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

The third sub-hypothesis (H_{01-3}): There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital entrepreneurship skills on the quality of education in the dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, quality of graduates) in Saudi universities.

The limitations of the study

The current study was limited to the following limits:

Objective limitations: The impact of digital entrepreneurship on the quality of education in Saudi universities

Time limitations: 2023/eighth month

Spatial limitations: Saudi universities

Human limitations: students

Second: Theoretical framework and previous studies

Theoretical framework

Introduction

Digital entrepreneurship plays an important role in enhancing customer retention and loyalty, creating products of customer value, creating job opportunities, working to increase demand and supply, renewing services, and working to facilitate communication between producers and customers by enhancing compatibility between them and enhancing competitiveness. The focus of digital entrepreneurship is creating value, creativity, and innovation (Al-Nisour and Khalifat, 2020). Digital entrepreneurship also represents the transformation of leaders towards a knowledge society and the realization and understanding that digital transformation is related to the capabilities that the leader possesses and the ability to use them in decisions that improve business performance and use information technology to create a competitive advantage through understanding behavioral, economic and social transformations (Al-Damaty, 2023). Digital entrepreneurship is considered a major factor affecting the development of educational institutions to successfully achieve digital transformation.

Moreover, universities also need to manage personal digital knowledge and entrepreneurship skills that match the characteristics of cultural businesses by matching entrepreneurial digital entrepreneurship with the principle of sustainable development (Liu, 2022). Also, most educational institutions seek to achieve quality education and work to achieve their goals and apply the

principles of quality education through the Ministry of Education.

Most of these institutions do not work according to the strategic planning approach in particular and identify their strengths and weaknesses and identify opportunities and risks in order to develop an important futuristic vision for achieving the goals and ambitions of the educational process (Khatahtbeh, 2022). Digital entrepreneurship is one of the modern strategies in achieving quality education, which focused on digital knowledge management, business environment management, and entrepreneurial leadership skills. The study also sought to apply it to the quality of education in Saudi universities because it achieves (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and distinction awards, graduate quality) (Al-Maabadi et al., 2020).

Digital entrepreneurship

The concept of digital entrepreneurship came as a result of the success and excellence of people who were able to create their own business projects on the Internet using available technology, using a set of advantages that we can call (advantages of the digital entrepreneur), the most important of which is the availability of more flexible times, as a pioneer can. Digital business determines the appropriate time for work, peak times, inappropriate postponement of appointments, and other advantages are also (simplicity of costs, ease of access to individuals, ease of advancement in work) (Hossam El-Din, 2023).

Digital entrepreneurship innovation is a key factor in transforming digital learning services. By exploring different forms of digital entrepreneurship innovation, we can identify new opportunities to improve the quality of education and create a more engaging learning experience for our students. Digital entrepreneurship also plays an essential role in achieving digital transformation, with the understanding that digital leaders are leaders who can lead through the use of digital technology (Umah et al., 2023).

Importance of digital entrepreneurship

Guberina et al (2021) indicated that the importance of entrepreneurship is increasing day by day to quickly adapt to the ongoing changes in the global economy. In this regard, it is worth noting that entrepreneurship is not just a single trait but involves a combination of different personality traits. The ability to anticipate, envision, strategic thinking, and teamwork are some examples of personality traits that entrepreneurial leaders exhibit. Marouf and Al-Kurdi (2021) defined digital knowledge management as: the activities that students carry out in order to acquire knowledge from electronic sources, store it, exchange it with others, and apply it in their academic activities for improvement.

The dimensions of digital knowledge management include (acquiring knowledge, organizing and preserving knowledge, sharing knowledge, application of knowledge, competitiveness, creative thinking to solve problems, planning for the future, cooperative work, and self-development).

Digital entrepreneurship goals

The goal of digital entrepreneurship and technological innovation is for universities, and the management of the business environment is measured by comparing businesses in countries or at the provincial level. The indicator of the urban business environment is more detailed and more accurate, and through the business environment that affects the digital innovation of educational institutions from a microscopic perspective, heterogeneity analysis is performed by combining the degree of market competition and regional differences (Wang et al., 2023).

Mr. Musa (2020) indicated that entrepreneurial skills are classified into several axes, including:

1. Personal entrepreneurship skills axis: It includes the skills of (creativity and innovation, responsibility and risk tolerance, entrepreneurship, perseverance)

2. Business management skills axis: It includes the skills of (planning, marketing and sales, negotiation, decision-making, finance)

3. Technical skills axis: It includes the skills of (communication, using and activating technology, networking, monitoring and scanning the environment)

Quality of university education

Khatatiya (2022) indicated that the quality of education refers to a number of plans and policies followed in educational institutions and all those in charge of them, including teachers and managers, with the aim of providing a distinguished educational service capable of improving the basic academic abilities and skills that all students need to complete the educational process and achieve their desired goals.

However, the multi-meaning and often polytheistic nature of the concept of quality education still creates difficulties for any initiative aiming to design and evaluate educational systems, plans and programs on a large scale. There is also a body of literature on the concept of quality education and it does not give a precise and widely accepted definition, paradoxes and the contraction of meanings, especially because it is a concept that is constantly changing (Durdas et al, 2023).

Also, the decisive factor in achieving and ensuring the quality of the educational process is the development and standardization of the technical base of educational materials, providing biology and chemistry laboratory with equipment and software through the disciplinary curricula and of course the interactive methods harmoniously combined by the teacher (Bordea, 2022).

Riadi et al (2022) also pointed out that the quality of education is related to the quality in the provision of education, which includes several aspects including quality in the learning process, the competence of graduates, the curricula used, the learning infrastructure, educational assessments, education staff and funding management used by the educational institution. Working on quality control in higher education is an obligation of every institution of higher education and can be achieved by applying several methods: self-evaluation, peer review, statistical data analysis, and

assessment of students' knowledge and competencies (Vukovic et al., 2022).

Education quality goals

Pramana et al (2021) indicated that the goal of quality education is to achieve the most important goal of managing the education system in the country, in which educational institutions are expected to be qualified and prepared to provide their people with equal and comprehensive educational service. The education they receive must be at a standard level and meet all requirements of the local community properly and effectively.

The education they receive must be of a high standard. It can also be discussed that the concept of education quality is from the point of view of stakeholders, so that the concept of quality varies according to the needs and interests of the parties related to the educational institution It can be viewed from the point of view of faculty members, students, and employers. It reflects the skills and knowledge students possess related to the chosen professions. As for society, quality in higher education means "confidence in the performance of higher education" (Zakaria, 2022).

Previous studies

Al-Dhahabi (2023) studied the impact of digital entrepreneurship on teaching methods for the blind. The study population was from Al Noor Center for the Blind in the State of Qatar. The descriptive analytical approach was followed. The questionnaire was adopted as a data collection tool. The sample size was (147), with the number of questionnaires suitable for analysis being (137), at a rate of (92.5%), and the statistical package program was used to analyze the study data. The most important findings are: the presence of a statistically significant effect at a large level (0.05) of digital entrepreneurship represented by its dimensions (digital knowledge management, learning environment management, entrepreneurship skills) in teaching methods at Al Noor Center for the Blind in the State of Qatar, where the coefficient of determination reached (96.9%). The study recommended working to enhance the culture of digital learning for individuals working at Al Noor Center, encouraging them to adopt entrepreneurial knowledge and raising awareness of the importance of digital entrepreneurship and its application in teaching methods for the blind. This can be done by involving the working individuals in specialized courses in modern training methods for the blind.

In his study, El-Damaty (2023) aimed to determine the impact of the dimensions of digital entrepreneurship on strategic improvisation at El-Arabi Group. The dimensions of digital entrepreneurship were creativity and support. The dimensions of strategic improvisation were strategic alertness, strategic agility, small structures, resource employment, and organizational memory. To achieve this goal, the study relied on the inductive approach (descriptive - analytical), and data was collected through a survey list, distributed to a random sample, from which (362) were retrieved, suitable for analysis. The data was analyzed with the statistical software SPSS. The results of the study showed that digital entrepreneurship is significantly affected by the two

dimensions of strategic alertness and micro-structures, and is partially affected by both strategic agility and organizational memory. The study also recommended developing training programs for leaders to develop their awareness of the importance of digital entrepreneurship and increase their knowledge of its impact in achieving strategic improvisation, providing its components, and enhancing the factors that lead to making the organization digitally entrepreneurship .The study of Khatahtbeh (2022) aimed to identify the degree of transfer of administrative expertise in light of the Corona pandemic and its impact on the quality of education in public schools in Ajloun Governorate from the point of view of educational supervisors. The study adopted the descriptive survey method. The study population consisted of all educational supervisors in Ajloun Governorate, numbering (31) male and female supervisors, and the questionnaire was adopted as a tool for collecting data. The study found that the degree of practice of transferring administrative expertise in light of the Corona pandemic in public schools in Ajloun Governorate, from the point of view of educational supervisors, was moderate, with an arithmetic mean of (3.45). It also found that the level of quality of education in The Corona pandemic continues in public schools in Ajloun Governorate from the point of view of educational supervisors was mean, with an arithmetic mean of (3.28). The study recommended the necessity of holding meetings between both the principal and the teachers periodically during the Corona pandemic and conveying the new experiences he gained during the pandemic to the teachers and informing them of the effective mechanisms and methods for dealing with the learning situation.

The study of Al-Saket (2022) aimed to determine the impact of digital entrepreneurship on creativity. The study population consists of Jordanian food industry projects. The study sample consisted of (166) senior, middle and executive management employees, representing 69% of the total decision distributed. The most important results of the study are: There is a statistically significant effect of digital entrepreneurship (digital entrepreneurship skills, digital knowledge management, digital business environment management) on creativity in Jordanian food industrial projects. It recommended the application of digital entrepreneurship to replace traditional entrepreneurship (which wasted a lot of effort and money), and its role in enhancing and creating creativity using modern technologies such as digital technologies to improve operations, increase productivity, and create new products, thus creating a competitive advantage for institutions. The study (Durdas et al., 2023) tackled the concept of quality of higher education, modern trends, and ensuring the quality of higher education in the context of global changes and challenges in higher education. To achieve these goals, the descriptive analytical method was used.

The most important results were consideration of the concept of quality and there was no consensus regarding its perception and evaluation. The quality of higher education was considered from a pedagogical point of view -as a methodological category that reflects the degree of conformity of the result with the set goal, as well as the conformity of the product with the requirements of consumers and as a set of its characteristics that determine the degree of suitability of the product for its intended use. It has been noted that the concept of quality and its indicators

are debatable due to the existence of a group of stakeholders – stakeholders in higher education. The difference in the value of quality of higher education for each of the stakeholders was determined by the presence of their own interests and their own vision of quality. The study also recommended emphasizing globalization, the expansion of higher education and the ICT revolution as factors that have radically changed the higher education environment and created new challenges for governments, higher education institutions and other stakeholders. However, Umah et al.'s (2023) study aimed to demonstrate the impact of the main school of innovation in digital entrepreneurship in digital transformation through knowledge and description in depth of detail, and is directed towards developing a theory based on the results about the process of digital transformation in schools. To achieve the objectives of this study, a qualitative approach was used with a subject in the Sidoarjo School, and interviews, observations, and documents were adopted as tools for collecting data.

Several results were reached, the most important of which is that the digital skills of school principals have an impact on the digital transformation process in religious schools. The digital transformation of the school is clearly visible in the achievement of vision indicators and the formation of a digital team coordinated by the SARPRAS team. The study also recommended the implementation of digital transformation in schools so that technology management is more effective. Originality/value: The results obtained in this study are innovative and relevant to school principals, in the context of managing digital transformation in schools

The study (Guberina et al., 2023) confirmed that it aimed to investigate the impact of entrepreneurial leadership on job insecurity and psychological well-being of employees during the Covid-19 pandemic, based on the common theoretical foundations of resource conservation and social learning theory. To explore the relationship of job insecurity with psychological well-being, and measure the impact of fear of Covid-19, an experimental study was conducted on a sample of 408 employees in Croatia. Data for the cross-sectional study were collected in November and December 2020. A strong impact of job insecurity on employees' psychological well-being was identified. The most important results were that fear of Covid-19 has negative psychological effects on well-being. Evidence did not support the theoretical positive effect of entrepreneurial leadership on job insecurity.

The strong point of our contribution is the finding that entrepreneurial leadership style alone does not protect against job insecurity. The study also recommended that other organizational factors, such as adaptation, learning abilities, developmental opportunities, personal disposition, and stress tolerance to be more comprehensively investigated.

The research is the first step toward enhancing our understanding of the entrepreneurial dimension of transactional psychology. The study of Alajmi (2022) aimed to know the extent to which school principals in Kuwait practiced digital entrepreneurship during the Covid-19 pandemic, clarified the extent to which teachers integrated technology in classrooms during the Covid-19 pandemic, and

showed the impact of principals' digital entrepreneurship Schools on teacher technology integration in Kuwait during COVID-19 pandemic. To achieve these goals, a cross-sectional survey was used to examine the level of digital entrepreneurship of school principals.

The most important results were that the leaders had a high level of wise entrepreneurship, a culture of learning in the digital age, excellence in professional practice, systematic improvement, and digital citizenship. The study recommended the need to support this study since its findings revealed that Internet learning increases student satisfaction. An active learning atmosphere can be created among students through digital teaching, thus enhancing satisfaction.

Third: Method and procedures

Study approach

This study is a descriptive and analytical study that aims to identify the independent variable represented by the impact of (digital entrepreneurship) on the dependent variable (quality of education).

The study follows the descriptive and analytical method to describe general information to users by converting data into results, using a questionnaire that was developed specifically to serve the purposes and directions of the study, and in consistent with the hypotheses that were adopted by the researcher, and to carry out the process of statistical analysis and reach the objectives set within the framework of this study.

Study population

The study population consisted of teaching staff in Saudi universities, which are represented by the following (professor, associate professor, assistant professor, lecturer). It was considered that the population was statistically unknown.

Study sample

The sample was taken randomly and was determined to be a size of (384) individuals and (384) questionnaires were distributed, (365) questionnaires were retrieved. After examination, (15) questionnaires were excluded and the number of questionnaires suitable for analysis was (350) questionnaires, with a percentage of (91.14%).

Data collection methods

The researcher relied on two sources to collect data to achieve the objectives of the theoretical and practical study:

Secondary data sources

Secondary data was obtained by reviewing the literature related to the study variables from books, research, and articles published in peer-reviewed journals, periodicals, and scientific theses

published on databases to cover the theoretical framework and clarify the various aspects and main concepts of this study.

Primary data sources: represent the data collected through the study tool (questionnaire).

Study tool

The study tool consisted of three parts as follows:

First part

It includes demographic variables, which are: gender, age, educational level, years of experience, and academic rank)

Second part

It is related to measuring digital entrepreneurship, which dealt with (3) dimensions: digital knowledge management, learning environment management, digital entrepreneurship skills, and is represented by (16) items.

Third part: represents the quality of education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and excellence awards, quality of graduates) and is represented by (25) paragraphs. A five-point Likert scale (1, 2, 3, 4, 5) was also used, where the five scores represent the following answers, respectively: (strongly disagree, disagree, moderately agree, agree, strongly agree).

The degree of importance was calculated as follows: It was based on the length of the paragraph as shown in Table (1), and the three categories of importance were explained as shown in Table (2).

Table 1 Category length calculation

Category length	Maximum score - minimum score / No. of levels	=	1-5 / 3	1.33

Table 2 Category length

Degree	Category
Low	2.33-1
medium	3.67-2.33
High	2.67-5

Content validity

It was verified by reviewing theoretical literature in previous studies, books, periodicals, articles published in peer-reviewed journals, and scientific theses published on the university library databases.

Face validity

The study tool was judged by (3) specialists and experts. Their opinions, observations, and viewpoints were taken into account to make the necessary modifications. The questionnaire was modified based on their opinions and directions, and its linguistic integrity was confirmed.

Tool reliability

Crenbach's alpha coefficient was calculated as in Table (3). Alpha values ranged between (0.713) as the lowest value, and (0.938) as the highest value. This shows that all alpha values exceeded the minimum acceptable percentage for the purposes of statistical analysis, as alpha is considered equal to or greater than (0.60) is acceptable in previous studies and the total value is (0.976), which is a high value.

Table 3 Cronbach alpha reliability coefficient values for the study scales

Variable	Paragraphs no.	Validity and reliability of the Crumbach alpha questionnaire
Digital knowledge management	6	0.930
business environment management	5	0.884
Entrepreneurial leadership skills	5	0.909
Independent variable: digital entrepreneurship	**16**	**0.605**
Professional and academic reputation	5	0.853
Leaders with a strategic vision	5	0.938
Quality of academic facilities	5	0.894
Quality and excellence awards	5	0.713
Quality of graduates	5	0.897
Dependent variable: quality of university education	**25**	**0.956**
Total	41	41

Fourth: Study results

This part deals with a presentation of the results reached by the study, which are divided as follows:

First: Results of demographic variables

It is noted from Table (4) that: Males constitute the largest percentage of the study sample members at a rate of (56.9%) compared to (43.1%) for females. Those aged from 40 to less than 50 constitute the largest percentage of the study sample members at a rate of (40.6%) and the lowest percentage was for those under 30 years of age (5.7%).

Those whose academic qualification is a doctorate (PhD) constitute the largest percentage of the study sample members, at a rate of (62.3%), and the lowest percentage was for those whose academic qualification is a technical education, at a rate of (0%).

Those whose years of experience ranged from 10 years to less than 15 years, and they constituted the largest percentage of the study sample members, at a rate of (38.9%), and the smallest

percentage was for those whose years of experience were less than 5 years, at a rate of (7.1%).

Those with an academic degree of assistant professor constituted the largest percentage of the study sample (40%), and the smallest percentage was for those with an academic degree of professor (6.3%).

Table 4 Distribution of the study population according to demographic variables

Variable	Category	Frequency	Percentage%
Gender	Male	199	56.9
	Female	151	43.1
Total		**350**	100%
Age	Less than 30	20	5.7
	30 – 41	88	25.1
	40 – 40	142	40.6
	Over 50	100	28.6
Total		**350**	100%
Academic qualification	Technical education	0	0
	Bachelor	4	1.1
	Master	128	36.6
	PhD	218	1.5
Total		**350**	100%
Years of experience	Less than 5 years	25	7.1
	5 – 10	110	31.4
	10 – 15	136	38.9
	Over 15	79	22.6
Total		**350**	100%
Academic degree	Professor	22	6.3
	Associate professor	56	16.0
	Assistant professor	140	40.0
	Lecturer	132	37.7
Total		350	100%
Total of study population		**350**	

Second: Results of means and standard deviations

The study questions were answered as follows:

Results of the first question: What is the level of digital entrepreneurship and its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills) from the perspective of the study population in Saudi universities?

To answer the first question: Arithmetic mean, standard deviations, and relative importance were analyzed. What is the level of digital entrepreneurship in its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills). Table (5) is illustrative.

Table 5 Results of arithmetic means and standard deviations for digital entrepreneurship (independent variable)

Rank	Paragraph	Arithmetic means	Standard deviation	Materiality
1	Knowledge management	4.12	0.75	High
2	Entrepreneurial leadership skills	3.99	0.74	High
3	Business environment management	3.92	0.76	High
Total		4.02	0.707	High

It is noted from Table (5) that digital entrepreneurship obtained a high score, as the arithmetic means reached (4.02), and came in first place after "Digital knowledge management," with a arithmetic means of (3.12), and "Entrepreneurial leadership skills" came in second place, with a means reached (3.99). In third place after "Business environment management," ranked with a score mean of (3.92), all of which came with a high score.

Results of the second question: What is the level of quality of university education in its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and excellence awards, quality of graduates) from the point of view of the study sample in Saudi universities?

To answer the first question: The arithmetic means, standard deviations, and materiality were analyzed. What is the level of quality of university education along its dimensions (academic and professional reputation, leaders with a strategic vision, quality of academic facilities, quality and excellence awards, quality of graduates). Table (6) shows this.

Table 6 Results of arithmetic means and standard deviations for educational quality (dependent variable)

Rank	Paragraph	Arithmetic mean	Standard deviation	Materiality
1	Academic and professional reputation	4.23	0.72	High
2	Leaders with a strategic vision	4.13	0.79	High
3	Quality of academic facilities	3.98	0.94	High
4	Quality of graduates	3.91	0.82	High
5	Quality and Excellence Awards	3.88	0.71	High
Total		4.03	0.687	High

It can be noted from Table (6) that the quality of university education obtained a high score, with the arithmetic mean reaching (4.03), and it came in first place after "academic and professional reputation," with a arithmetic mean of (4.23), and "Leaders with a strategic vision" came in second place. With an arithmetic mean of (4.13), it came in third place after "Quality of academic facilities," with an arithmetic mean of (3.98), and "Quality of graduates" came in fourth place, with an arithmetic mean of (3.91), and "Quality and excellence awards" came in fifth place, with an athematic mean reached (3.88), and all of them came with a high score.

Third: Testing the study hypotheses

The main study hypothesis and its sub-hypotheses were tested as follows:

The first main hypothesis First: HO.1 The first main hypothesis: There is no statistically significant effect at a significant level (α≤0.05) of water harvesting represented by its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills) on the quality of university education in its dimensions (academic and professional reputation, Leaders with a strategic vision, quality of academic facilities, quality and excellence awards, quality of graduates) in Saudi universities from the point of view of the study sample .To test this hypothesis, the standard multiple linear regression test was used, and Table (7) shows this.

Table 7 Standard multiple regression analysis to identify the impact of digital entrepreneurship represented by its dimensions (digital knowledge management, learning environment management, digital entrepreneurship skills) on the quality of university education with all its dimensions combined in Saudi universities

	Model summary		Variance [b]				Regression coefficients [a]		
Dependent variable	RR Correlation coefficient	R^2 Coefficient of determination	Degree of freedom	(F) Value	Sig F statistical significance	Dimensions of the independent variable	(B) Value	(T) Value	Sig t statistical significance
Independent variable	0.899	0.808	Regression 3	484.311	0.000	Constant	0.576	6.141	0.000
			Residual 336			Digital knowledge management	0.248	6.211	0.000
			Total 349			Business environment management	0.466	10.288	0.000
						Entrepreneurial leadership skills	0.151	2.798	0.005

[a] Independent variable: Digital entrepreneurship represented by its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills)

[b] Dependent variable: Quality of university education in all its dimensions

Tracking the (t) test values on Table (7) shows that digital entrepreneurship represented by its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills) has a statistically significant impact on the level of quality of university education in all its dimensions combined, as the calculated (t) values reached Between (2.798 - 10.288), all of which are significant values at the significance level (α≤0.05). It is noted that the value of the correlation coefficient for the relationship between digital entrepreneurship in its dimensions and the quality of university education in its dimensions together reached (R=0.899), and the coefficient of determination reached (R^2=0.808). This means that digital entrepreneurship as an independent variable in its dimensions explains (80.8%) of the variance in the dependent variable, which is the quality of university education in all its dimensions combined, and the calculated F value was (F =

484.311), which is a significant value at the significance level (α≤0.05). To determine the importance of each independent variable separately in the impact of digital entrepreneurship on the quality of university education in all its dimensions together, a Stepwise Multiple Regression analysis was conducted, as shown in Table (8), which shows the order in which the independent variables enter the regression equation.

Table 8 Results of Stepwise Multiple Regression analysis to predict the level of quality of university education with its combined dimensions through the dimensions of digital entrepreneurship

Model number	Model summary	Variance			
	R Correlation coefficient	R^2 Determination coefficient	Degree of freedom	(F) value	Sig F statistical significant
1	0.872	0.711	1	1099.215	0.000
2	0.896	0.866	2	708.610	0.000
3	0.899	0.874	3	484.311	0.000

Model number
1. Learning environment management
2. Learning environment management, digital knowledge management
3. Learning environment management, digital knowledge management, entrepreneur leadership skills

The results presented in Table (8) shows that the dimensions of the independent variable "digital entrepreneurship" were as follows: Business environment management came in first place and explained an amount of (76%) of the variance in the dependent variable "quality of university education in its combined dimensions," while digital knowledge management was in second place, as it explained with business environment management an amount of (80.3%) of the variance in the quality of university education in its dimensions combined. Entrepreneurial leadership skills ranked third with business environment management and digital knowledge management, and explained an amount of (80.8%) of the variance in the quality of university education in its combined dimensions. Accordingly, the null hypothesis is rejected and the alternative hypothesis is accepted, meaning that "there is a statistically significant effect at a significant level." (α≤0.05) for rainwater harvesting represented by its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills) in the quality of university education with its dimensions combined.

Table 9 Results of stepwise multiple linear regression coefficients to reveal the effect of digital entrepreneurship and its dimensions on the quality of university education with all its dimensions combined

	Model	Regression coefficients		
		(B) value	(T) Value	Sig t statistical significant
1	Business environment management	0.786	33.154	0.000
2	Business environment management	0.550	16.022	0.000
	Digital knowledge management	0.305	8.788	
3	Business environment management	0.466	10.288	0.000
	Digital knowledge management	0.248	6.211	0.000
	Entrepreneurial leadership skills	0.151	2.798	0.005

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It is noted from Table (9) that all values of (B) at the calculated and different levels of (T) in the three models had significance between (0.000 - 0.005), and all of them were less than (0.05). They are significant at the level (α≤0.05). This confirms the significance of the coefficients. Based on the above, we reject the first main null hypothesis and accept the alternative hypothesis, which states that there is a statistically significant effect at a significant level (α≤0.05) for rainwater harvesting represented by its dimensions (digital knowledge management, business environment management, entrepreneurship skills) on the quality of university education with all dimensions combined.

The third question: What is the impact of digital knowledge management on the quality of university education in all its dimensions from the point of view of the study sample in Saudi universities?

To answer the third question, the first sub-hypothesis (**HO1.1**) was tested, where a (Simple Regression) test was done to identify the relationship between digital knowledge management in the quality of university education with all its dimensions combined from the point of view of the study sample, and Table (10) shows this.

HO1.1 The first sub-hypothesis: There is no statistically significant effect at a significant level (α≤0.05) of digital knowledge management on the quality of university education in all its dimensions combined from the point of view of the study sample.

Table 10 Results of the median linear regression test to reveal the impact of digital knowledge management on the quality of university education in all its dimensions combined

Dependent variable	Model summary		Variance [b]				Regression coefficients [a]		
	RR Correlation coefficient	R^2 Coefficient of determination	Degree of freedom		(F) Value	Sig F statistical significance	Dimensions of the independent variable	(B) Value	(T) Value	Sig t statistical significance
Independ-ent variable	0.811	0.658	Regre-ssion	1	668.962	0.000	Constant	0.978	8.163	0.000
			Resid-ual	348			Digital knowledge management	0.740	25.864	0.000
			Total	349						

[a] The independent variable: digital knowledge management

[b] Dependent variable: quality of university education in all its dimensions

Looking at Table (10), the results showed that the value of the correlation coefficient (R) between the two variables (digital knowledge management and the quality of university education in their combined dimensions) was (0.811), and the relationship between the two variables was direct. This explains that the digital knowledge management dimension positively affects the dependent variable, "the quality of university education in its combined dimensions," and the value of the

coefficient of determination (R^2) was (0.658). This means that (65.8%) of the change in digital entrepreneurship and the quality of university education in its combined dimensions. The calculated (F) value was (668.962) with a level of statistical significance (0.000), which is less than ($\alpha \leq 0.05$). This confirms the significance of the regression. Based on the previous results, the null hypothesis was rejected, and the alternative hypothesis was accepted, meaning that there is a statistically significant effect at a significant level ($\alpha \leq 0.05$) of digital knowledge management on the quality of university education in all its dimensions from the point of view of the study sample.

The fourth question: What is the impact of managing the learning environment on the quality of university education in all its dimensions from the point of view of the study sample in Saudi universities?

To answer the fourth question, the second sub-hypothesis (**HO1.2**) was tested through a simple regression test to identify the relationship between business environment management and the quality of university education with all its dimensions combined from the point of view of the study sample. Table (11) is illustrative.

HO1.2 The second sub-hypothesis: There is no statistically significant effect at a significant level ($\alpha \leq 0.05$) of managing the learning environment on the quality of university education in all its dimensions combined from the point of view of the study sample.

Table 11 Results of the simple linear regression test to reveal the effect of managing the learning environment on the quality of university education in all its dimensions combined

Dependent variable	Model summary		Variance [b]			Dimensions of the independent variable	Regression coefficients [a]		
	RR Correlation coefficient	R^2 Coefficient of determination	Degree of freedom	(F) Value	Sig F statistical significance		(B) Value	(T) Value	Sig t statistical significance
Independent variable	0.872	0.760	Regression 1 Residual 348 Total 349	1099.215	0.000	Constant	0.949	10.037	0.000
						Digital knowledge management	0.786	33.154	0.000

[a] The independent variable: business environment management

[b] Dependent variable: quality of university education in all its dimensions

Looking at Table (11), the results showed that the value of the correlation coefficient (R) between the two variables (business environment management and the quality of university education in their combined dimensions) was (0.872), and the relationship between the two variables was direct. This explains that the dimension of managing the business environment positively affects the dependent variable, "the quality of university education in its combined dimensions," and the value

of the coefficient of determination (R^2) was (0.760), meaning (76%) of the variables of digital entrepreneurship and the quality of university education in its combined dimensions, while the calculated F value is (1099.215) with a statistical significance level of (0.000) which is less than ($\alpha \leq 0.05$). This confirms the significance of the regression. Based on the previous results, the null hypothesis was rejected, and the alternative hypothesis was accepted, meaning that there is a statistically significant effect at a significant level ($\alpha \leq 0.05$) of business environment management on the quality of university education in all its dimensions combined from the point of view of the study sample.

Question five: What is the impact of digital entrepreneurship skills on the quality of university education in all its dimensions from the point of view of the study sample in Saudi universities?

To answer the fifth question, the third sub-hypothesis (**HO1.3**) was tested through a simple regression test to identify the relationship between entrepreneurial leadership skills and the quality of university education with all its dimensions combined from the point of view of the study sample. Table (12) illustrates this.

HO1.3 The third sub-hypothesis: There is no statistically significant effect at a significant level ($\alpha \leq 0.05$) of digital entrepreneurship skills on the quality of university education in all its dimensions combined from the point of view of the study sample.

Table 12 Results of a simple linear regression test to reveal the effect of entrepreneurial leadership skills on the quality of university education in all its dimensions combined

Model summary			Variance [b]				Regression coefficients [a]		
Dependent variable	RR R Correlation coefficient	R^2 Coefficient of determination	Degree of freedom	(F) Value	Sig F statistical significance	Dimensions of the independent variable	(B) Value	(T) Value	Sig t statistical significance
Independent variable	0.844	0.713	Regression 1 Residual 348 Total 349	864.000	0.000	Constant	0.880	8.082	0.000
						Entrepreneurial leadership skills	0.078	29.394	0.000

[a] Independent variable: entrepreneurial leadership skills

[b] Dependent variable: quality of university education in all its dimensions

The results in Table (12) showed that the value of the correlation coefficient (R) between the two variables (entrepreneurial leadership skills and the quality of university education in all their dimensions) was 0.844, and the relationship between the two variables was direct. This explains that the dimension of entrepreneurial leadership skills positively affects the dependent variable, "the quality of university education in its combined dimensions," and the value of the coefficient

of determination (R^2) was (0.713), meaning a percentage of (71.3%) of the change in digital entrepreneurship and the quality of university education in its combined dimensions. The calculated (F) value was (864.000) with a level of statistical significance (0.000), which is less than ($\alpha \leq 0.05$). This confirms the significance of the regression. Based on the previous results, the null hypothesis was rejected, and the alternative hypothesis was accepted, meaning that there is a statistically significant effect at a significant level ($\alpha \leq 0.05$) of entrepreneurial leadership skills on the quality of university education with all its dimensions combined from the point of view of the study sample.

Fifth: Discussing the results

First: Discussing the results related to testing the means and standard deviations of the independent variable (digital entrepreneurship), from the point of view of academics in Saudi universities

The results indicate that digital entrepreneurship obtained a high score, as the arithmetic mean reached (4.02), and the "digital knowledge management" dimension came in first place, with an arithmetic mean of (4.12). The "learning environment management" dimension came in second place, with an arithmetic mean (3.99). In third place came "digital entrepreneurship skills," with an arithmetic mean (3.92), and all of them came with a high score. The discussion of the results of the dimensions of digital entrepreneurship was as follows:

Digital Knowledge Management

The results indicate that digital knowledge management obtained a high degree of importance, as the arithmetic mean reached (4.12), and the arithmetic mean values ranged between (3.99-4.31). This indicates the application of the study population in Saudi universities to digital knowledge management and this is shown through the university administration's promotion of the culture of digital learning and its keenness to consolidate the values of digital knowledge and functional values to achieve pioneering performance in completing tasks. The university also realizes the importance of motivating talented people in order to enhance their talents.

Learning environment management

The results indicate that the management of the learning environment obtained a high degree of importance, as the arithmetic mean reached (3.92), and the values of the arithmetic means ranged between (3.82-4.09). This indicates the application of the study population in Saudi universities to the management of the learning environment, and it appears This is through the university keeping pace with changes in the business environment in a way that is consistent with achieving the strategic objectives. The university continuously evaluates the impact of the entrepreneurship strategy on its overall performance. The university has a flexible organizational structure that allows for modification and commensurate with changes in the business environment.

Digital leadership skills

The results indicate that the digital skills of leaders obtained a high degree of importance, as the arithmetic mean reached (3.99), and the arithmetic mean values ranged between (3.69-4.15). This indicates the application of digital entrepreneurship skills by the study population in Saudi universities. This is demonstrated by strengthening the university administration's ability to empower its employees to improve the accomplishment of tasks using digital means. It also grants the university administration the required powers so that employees can perform their tasks using digital means and has the ability to influence employees' behavior using digital means.

First: Discussing the results related to testing the means and standard deviations of the dependent variable (quality of education) from the point of view of science teachers, in public schools in the Deir Alla district

Quality of education

The results indicate that the quality of education obtained a high degree of importance, as the arithmetic mean reached (4.03), and the values of the arithmetic means ranged between (3.88-4.23). This indicates a high level of education quality, among the study population, in Saudi universities. This is demonstrated by the fact that the university has faculty members with sufficient academic and professional reputation to achieve the university's mission and goals. The university administration has an ambitious strategic vision and a clear message translated into achievable axes and goals. The university also has sufficient and appropriate parking for its customers' cars and the university building is attractive to the public. For service seekers, the university is also interested in granting the Excellence in Teaching Award to members of its faculty, and it has an interest in granting an award for excellence in scientific research to its employees. The university also sees the employment of its graduates by various business organizations as an honest standard for judging the quality of its graduates.

Third: Conclusions related to the impact of the independent variable: (digital entrepreneurship) on the dependent variable: (quality of education), from the point of view of Saudi universities

The results of hypothesis testing indicate that digital entrepreneurship represented by its dimensions (digital knowledge management, business environment management, entrepreneurial leadership skills) has a statistically significant impact on the level of quality of university education in all its dimensions combined, as the coefficient of determination reached (R^2=0.808). The results of hypothesis testing indicate that the digital knowledge management dimension positively affects the dependent variable "quality of education," and the value of the coefficient of determination (R^2) was (65.8%). The results of hypothesis testing indicate that the dimension of managing the learning environment positively affects the dependent variable "quality of education," and the value of the coefficient of determination (R^2) reached (76%).

The results of hypothesis testing indicate that the digital leadership skills dimension positively affects the dependent variable "quality of education," and the value of the coefficient of determination (R^2) was (71.3%).

Results

The study reached a set of results

1. The university administration promotes the culture of digital learning. It is also keen to consolidate the values of digital knowledge and establish functional values in order to achieve pioneering performance in completing tasks. The university also recognizes the importance of motivating talented people in order to enhance their talents. It also focuses on designing administrative processes to be compatible with the principle of integration between the various departments.

2. The university keeps pace with changes in the business environment in a way that is consistent with achieving strategic goals and continuously evaluates the impact of the entrepreneurship strategy on its overall performance. It also has a flexible organizational structure that allows for modification and in a way that is consistent with changes in the business environment.

3. The university's faculty members contribute to developing the curricula and various activities therein, and by providing intellectual contributions related to the university's work. The university also focuses on the requirements of theoretical and applied scientific research and is keen on the participation of its employees.

4. The university has sufficient and appropriate parking for its customers' cars. It is an attractive building for service seekers. The general appearance and interior design (furniture, decor) of the university is highly organized and integrated.

Conclusion

The study aimed to demonstrate the impact of digital entrepreneurship on the quality of education in Saudi universities. The results found that digital entrepreneurship obtained a high degree, with the arithmetic mean reaching (4.02), and that the quality of education attained a high degree of importance, as the arithmetic mean reached (4.03). And that digital entrepreneurship represented by its dimensions (digital knowledge management, business environment management, entrepreneurship skills) has a statistically significant impact on the level of quality of university education in all its dimensions combined, as the coefficient of determination reached (R^2=0.808).

Recommendations

The study recommended working on the following:

1. Motivating the university administration to increase awareness of the importance of digital entrepreneurship, and diversifying its methods in attracting qualified personnel and expertise that

enhance its administrative orientations (such as internal recruitment, external recruitment), and allocating an additional appropriate budget to train employees with entrepreneurial talents on modern technical applications.

2. The university encourages its employees to attend conferences, workshops, and hold scientific meetings, and to work to create and support an organizational culture and commit to a culture that enhances the spirit of initiative and teamwork.

4. Providing appropriate equipment and techniques used in the teaching process in general, and the university allocating awards to its employees related to organizing training courses.

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