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KNOWLEDGE ECONOMY AND THE TRANSFORMATION OF EDUCATIONAL SYSTEMS: STRATEGIES FOR BUILDING HUMAN CAPITAL IN THE DIGITAL AGE-A FIELD STUDY AT THE COLLEGE OF ADMINISTRATION AND ECONOMIC

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Abstract:

This study aims to explore the relationship between the knowledge economy and the transformation of educational systems by analyzing strategies for building human capital within the university environment. This inquiry is conducted in the context of the rapid digital transformations characterizing the modern era. The College of Administration and Economics at the University of Thi-Qar was selected as the field of study due to its role as an educational setting striving to integrate into the digital education system and to harness digital tools in developing human competencies.

The study employed the descriptive-analytical methodology, relying on a specially designed questionnaire consisting of 18 items distributed across various domains related to the knowledge economy, digital education, and human capital development. A sample of 100 faculty members and staff from the college was randomly selected to represent the target population. The validity and reliability of the research instrument were verified using appropriate statistical methods.

Findings of the study revealed a high level of awareness among respondents regarding the importance of digital transformation in supporting the educational process. The results also indicated that the knowledge economy effectively contributes to reshaping the priorities of educational institutions, particularly in enhancing digital skills and promoting analytical and critical thinking among students. Moreover, the study identified a disparity in the digital competencies possessed by educational personnel, underscoring the need for targeted and structured training interventions.

Keywords: Knowledge Economy, Educational Systems, Human Capital, Digital Age

INTRODUCTION

In recent decades, the world has witnessed profound transformations that encompassed all economic, social and scientific aspects, resulting in the birth of a new type of economy known as...The "knowledge economy," where knowledge has become the most important resource for generating wealth and achieving sustainable development. In this new reality, natural resources or traditional capital alone are no longer sufficient to ensure growth. Rather, knowledge, innovation, and human capital have become the primary drivers of economic or social progress.

In this context, human capital is the pivotal element, possessing the capacity to generate, utilize, and invest in knowledge. This has led to its widespread attention from governments and educational institutions around the world. As humanity enters the digital age, the need to review and develop educational systems has increased, as they are the primary means of preparing individuals capable of interacting positively with the challenges and requirements of the knowledge economy.. It has become necessary for educational systems to go beyond traditional concepts, to adopt modern educational and training strategies that focus on developing higher mental skills, enhancing the ability to learn independently, and keeping pace with rapid technological transformations.In a knowledge economy, education is no longer limited to the transfer of information, but rather focuses on creating innovative minds capable of producing and applying knowledge in various fields.

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The first topic
Research methodology and previous studies

Research problem

The global shift to a knowledge economy poses one of the most significant challenges facing traditional education systems, particularly in developing countries, which still suffer from a clear digital and knowledge gap. With the advancement of information and communications technology and the emergence of new educational concepts such as digital learning, open education, and lifelong learning, it has become necessary to rethink the structure, methods, and curricula of the education system to ensure it keeps pace with the requirements of the modern labor market, which is based on efficiency, innovation, and intellectual flexibility.

Higher education institutions continue to face difficulties in aligning their outputs with the needs of the knowledge economy. Many colleges, including colleges of management and economics, suffer from traditional teaching methods and a lack of linking educational curricula to digital developments. This negatively impacts the efficiency of the human capital produced and weakens its ability to contribute effectively to the contemporary national economy..

From this standpoint, the basic research problem is represented by the following question::

- To what extent do the educational systems in the College of Engineering contribute to building human capital in accordance with the requirements of the knowledge economy in the digital age?

This main question has a number of sub-questions, including::

1. How aware are engineering college students and faculty members of the concept of the knowledge economy and its requirements?
2. What are the educational strategies adopted by the college, and are they in line with the requirements for building human capital?
3. What are the most prominent challenges facing the college in activating digital education and developing curricula to serve the knowledge economy?

The importance of research

The importance of this research lies in its examination of one of the most prominent contemporary transformations the world is witnessing: the transition from a traditional economy to a knowledge economy. This transformation poses profound challenges to educational systems and calls for a reconsideration of methods for preparing and qualifying human resources to meet the requirements of the digital age. In this context, the research highlights the importance of developing educational strategies in universities and higher education institutions, as they are the primary incubator for producing human capital capable of leading sustainable development processes..

This research examines the relationship between educational systems and the knowledge economy through an applied study at the College of Engineering, an academic environment that represents a meeting point between economic theory and educational practice. Hence, the importance of the study stems from its attempt to diagnose the reality of education at this institution, reveal its ability to keep pace with digital transformations, and adopt strategies capable of building qualified human capital with the technical and cognitive skills required by the contemporary labor market..

Research objective

Understanding the knowledge economy and the transformation of educational systems. Strategies for building human capital in the digital age. Research hypotheses.

Based on the research problem and objectives, and in light of the study variables, the following hypotheses were developed to be tested in the field::

1. There is a statistically significant relationship between the educational strategies followed in the College of Engineering and the development of human capital in line with the requirements of the knowledge economy..
2. There is a high awareness among faculty members and students at the college of the concept of the knowledge economy and its dimensions in the educational environment..
3. Digital transformations in the college's educational system contribute positively to developing students' cognitive and technological skills..
4. The college suffers from administrative and technical challenges that hinder the implementation of effective strategies for building human capital in accordance with the knowledge economy..
5. The current educational programs at the college do not sufficiently match the requirements of the knowledge-based labor market..

Definition of terms

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Knowledge Economy: The knowledge economy refers to an economic system that relies primarily on knowledge and information as the primary source of production and economic growth, encompassing innovation, technology, education, and scientific research. In this economy, the ability to produce and distribute knowledge becomes a key element in enhancing competitiveness and economic prosperity (Badr, 2010, p. 15).
Human capital: Human capital represents the sum of the cognitive abilities, skills, and experiences possessed by individuals within a society, which can be invested to increase productivity and achieve economic growth. This capital includes all educational and training aspects that contribute to individual development (Brihi, 2011, p. 22).
Educational systems: Educational systems represent a set of institutions, policies, and educational curricula that aim to provide individuals with the knowledge and skills necessary to achieve success in various areas of life, and which have evolved over time to keep pace with the needs of the labor market and technological changes (ESCWA, 2003, p. 33).
Digital transformation in education: Digital transformation in education refers to the use of digital technology and modern innovations to improve and enhance the educational process, starting with e-learning content and extending to digital educational platforms that facilitate distance learning and provide new opportunities for students (Shaltout, 2009, p. 40).
Educational Strategies: Educational strategies encompass the set of methods and approaches adopted by educational institutions to achieve educational and learning objectives. These strategies include the use of technological means and modern educational models such as blended learning and interactive learning, which aim to enhance the effectiveness of education in an environment characterized by continuous transformation (Nassef, 2007, p. 18).

Previous studies

1. **Mahmoud Abdullah Muhammad Mansour, 2021, "Digital Transformation as a Mechanism for Developing Human Capital in Higher Education Institutions"**

This study aimed to determine the level of digital transformation and human capital in higher education institutions, identify the dimensions most closely related to human capital development from the perspective of faculty members, and identify the challenges facing digital transformation. The study relied on a descriptive approach using a comprehensive social survey of 114 faculty members at the Faculty of Social Work at Helwan University. The study found that the level of digital transformation and human capital in higher education institutions is average, and demonstrated a statistically significant positive relationship between digital transformation and human capital development.

2. **Wasan Mishal Sarhan and Abdul Razzaq Hamad Hussein, 2022, "The Digital Economy and Its Role in Sustainable Development in the Iraqi Economy (An Analytical Study for the Period 2004-2020)"**

This study examined the digital economy and its impact on sustainable development in Iraq during the period from 2004 to 2020. The study was based on the hypothesis that there is a relationship between the development of the digital economy and the extent of sustainable development in Iraq. The study aimed to analyze the impact of digital economy indicators on sustainable development in Iraq.

3. **Amal Sarhan Sulaiman Al-Taie, 2023, "The Digital Divide in Education in Iraq and the Requirements of Digital Transformation: A Survey Study of the Opinions of a Sample of University of Mosul Instructors"**

This study aimed to explore the digital divide in education in Iraq and the requirements for digital transformation through a survey of the opinions of a sample of University of Mosul faculty members. The challenges facing education in Iraq in light of the digital transformation were analyzed, and recommendations were made to bridge the digital divide and promote digital transformation in educational institutions.

4. **Fatima Nasr Bin Naji, 2020, "Digital Transformation in Arab Universities (Iraqi University as a Model)"**

This study examined the experience of digital transformation in Arab universities, focusing on the Iraqi University as a model. The study reviewed how digital transformation is being implemented in higher education, the challenges it faces, and the opportunities it offers to improve the quality of education and scientific research.

The second topic
Theoretical framework

First: The concept of knowledge economy

Definition of knowledge economy

The knowledge economy is a concept that expresses an economy that relies on knowledge as a primary tool for achieving economic growth. It includes the use of information, technology, and innovation to enhance the added value of institutions and countries. This economic model is not limited to material resources, but rather relies on human capital and the ability to invest knowledge to achieve sustainable growth. Knowledge economies rely on information and communications

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technology.(ICT) as a fundamental tool for transferring knowledge from individuals and institutions to society as a whole. (Fluck, 2001, p. 43)

In this context, there is an increasing focus on education and training, as improving human capital is considered an important factor in increasing productive efficiency at the individual and collective levels. This economic transformation reflects the importance of innovation and modern technologies in enhancing the competitiveness of nations and companies.(Galbreath, 1999, p. 14). This transformation also contributes to reducing the gaps between developed and developing countries, as individuals can acquire advanced digital skills, which contributes to achieving sustainable economic development.

Accordingly, understanding the knowledge economy is essential for defining effective economic strategies. Knowledge today is an indispensable resource for global economic growth, and thus attention to the production and distribution of knowledge has become part of government and business policies aimed at achieving continuous innovation.(Molebsh, 1999, p. 8).

Components of the knowledge economy

1. Knowledge and Technology:

The knowledge economy relies primarily on the use of knowledge and technology as key tools for achieving economic growth and progress. In this context, information and communications technology (ICT) is considered(ICT) is one of the main pillars that supports the flow of knowledge between individuals and institutions. This technology helps accelerate production processes and achieve innovation, which enhances the competitiveness of countries and companies. The use of modern technologies can contribute significantly to improving performance efficiency and stimulating creativity (Soraty, 2005, p. 51). In this context, Nofal (2019) indicated that information technology has become the cornerstone of building a knowledge economy, as it contributes to the rapid and effective transfer and distribution of knowledge among various economic sectors. (World Bank, no year, p. 10)

2. Human Capital:

Human capital is a critical component of a knowledge economy, as people with specialized skills and knowledge are the foundation of innovation and productivity. Therefore, a knowledge economy emphasizes investing in education and continuous training to develop technical and managerial skills, which helps create an environment that supports high productivity. Higher education and workforce training contribute to building human capital, which is key to economic progress.(Yuen, 2005, p. 60). Al-Qurashi's (2018) study also emphasized the importance of human capital in developing countries, noting that improving the level of education and technical training can significantly improve individuals' ability to adapt to the requirements of the knowledge economy. (USAID, 2012, p. 27)

3. Research and Development(R&D):

Research and development is a fundamental component of the knowledge economy, contributing to the creation of innovative technological solutions and the improvement of products and services. Investing in this field improves competitiveness and increases productivity, and enhances organizations' ability to offer new solutions that meet market needs. Scientific research and development helps adopt new technologies and is a key driver of sustainable economic growth.(Nelson & Winter, 1982, p. 35) Research and development has become a crucial factor in activating innovation and achieving industrial excellence in countries that implement knowledge economy strategies. (World Bank, 2010, p. 35)

4. Institutional system and government policies:

Government institutions play a significant role in supporting the knowledge economy by developing policies that encourage innovation and improve the business environment for individuals and businesses. These policies include encouraging entrepreneurship, facilitating access to finance, supporting research and development, and creating a legal and legislative environment that stimulates knowledge exchange. Governments contribute to supporting strategic directions that encourage continuous learning and investment in innovation.(OECD, 1996, p. 18). Al-Zoubi (2020) emphasized that effective government policies are essential for stimulating innovation in a knowledge-based economic environment. (Al-Sakarna, 2001, p. 12)

5. Information systems and digital infrastructure:

Information systems and digital infrastructure are essential foundations supporting the transition to a knowledge economy. These systems enable the rapid and efficient storage and transmission of data and information, helping improve performance across various sectors. Digital infrastructure accelerates the flow of information and opens up opportunities for collaboration between global institutions. It is also a key driver in supporting the digital economy.(Romer, 1990, p. 53). Awad (2018) noted that digital infrastructure is a crucial factor in developing the knowledge economy in developing countries, emphasizing the need to improve this infrastructure to accelerate digital transformation. (Council of Advisors, 2014, p. 45)

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6. Innovation and Entrepreneurship:

Innovation is a key driver of the knowledge economy, enabling companies and individuals to adapt to rapid changes in markets and technologies. Entrepreneurship is also a vital factor in implementing these innovations and transforming them into practical, marketable solutions. Innovation in products and services contributes significantly to economic growth and the development of global markets.Al-Badri (2019) also emphasized in his study that innovation and entrepreneurship are two key factors in determining the success of a knowledge economy, highlighting the role of small and medium-sized enterprises (SMEs) in driving innovation in this context (Al-Hariri and Saliha, 2011, p. 20).

The importance of the knowledge economy in the digital age

The knowledge economy in the digital age represents a qualitative shift in how knowledge and information are produced, distributed, and consumed. In this context, the knowledge economy is of great importance for several reasons, especially in light of the rapid technological developments the world is witnessing in the digital age..

1. Achieving sustainable economic growth:

In a knowledge economy, education, continuous training, and innovation are the primary drivers of economic growth. With increasing reliance on technology and information, countries and companies can increase their competitiveness and achieve sustainable development. For example, countries that invest in developing human capital using digital age technologies gain a competitive advantage in terms of productivity and technological advancement.(Najm, 2005, p. 223)
In this context, Al-Qurashi (2018) points out that countries' investment in information technology and digital education contributes significantly to promoting long-term economic growth (Poverty in Iraq, 2007, p. 29).

2. Promoting innovation and creativity:

Innovation is a crucial component of the knowledge economy, especially in the digital age, where new technologies accelerate innovation processes in various fields such as manufacturing, services, healthcare, and education. The knowledge economy helps companies develop new products and services that meet market needs and solve complex problems using modern technologies such as artificial intelligence and big data analytics.(Big Data). Al-Fatlawi's study (2009) also confirmed that innovation in the digital age has become primarily dependent on modern technology in analyzing data and providing innovative solutions. (Al-Fatlawi, 2009, p. 31)

3. Enhancing global competitiveness:

In the knowledge economy, companies and countries can leverage digital networks and modern technologies to enhance their ability to compete globally. This technology facilitates access to new markets and expands the scope of business activity, opening up new markets for digital products and services. The development of the Internet and digital systems makes it possible to create electronic markets that transcend geographical and economic boundaries, contributing to enhanced competitiveness (Al-Fatlawi, 2009, p. 31).According to Araba (2011), countries that are able to harness these digital systems will be able to enhance their competitiveness in the global economy (Araba and Ben Awali, 2011, p. 16).

4. Improving quality of life:

The knowledge economy is a key means of improving quality of life in the digital age. Through the use of knowledge technologies, many aspects of daily life can be improved, such as healthcare, education, and government services. For example, in healthcare, information technology can be used to improve diagnosis and treatment and provide remote healthcare. Digital education technology also allows students to access diverse learning resources, enhancing educational opportunities for all.Al-Khalayleh (no year) pointed out that the knowledge economy contributes to improving the standard of living in many sectors by providing smart solutions to complex problems. (Al-Khalayleh, no year, p. 38)

Dimensions of the knowledge economy

The knowledge economy is not merely an economic system based on the use of information and modern technologies. Rather, it is a comprehensive transformation in many areas that overlap in the construction and development of this system. The dimensions of the knowledge economy are diverse, encompassing various aspects of economic and social life, and significantly impacting how the production, distribution, and consumption of value are shaped in the digital world. (Dhiab, 2006, p. 30)

1. Technological dimension:

The technological dimension is one of the fundamental dimensions upon which the knowledge economy relies. This dimension includes the use of modern technologies such as artificial intelligence, big data, the Internet of Things, and information and communications technology, which contribute to accelerating the production and exchange of knowledge more efficiently. Technological progress enhances the ability to access knowledge quickly and accurately, enabling companies and individuals to make decisions based on accurate and up-to-date information (Al-Mabsali, 2011, p. 44).

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Technology also contributes to facilitating the research and development process, which enhances innovation and creativity across various industries (Nazim and Rashid, 2005, p. 42).

2. Social dimension:

The social dimension of the knowledge economy is closely linked to the formation of human capital and the education of individuals. In this context, continuous education and training become essential for developing skills that match the needs of the digital age. In the knowledge economy, investment in human capital is considered one of the most important factors contributing to economic growth. Rasan's (2005) study confirmed that digital education is the cornerstone in enabling individuals to adapt to new technologies and innovate in various fields. (Rasan, 2005, p. 14)

3. Economic dimension:

The economic dimension of the knowledge economy relates to how knowledge and information are transformed into economic value. This dimension includes the production of knowledge-based goods and services, such as software, consulting services, and digital content. It is also linked to the development of digital markets that rely on modern technological systems such as e-commerce platforms and digital financial applications. Shihan (2010) indicates that the knowledge economy requires reshaping the economic structure to keep pace with technological developments, including encouraging innovation and supporting knowledge-based business initiatives. (Shihan, 2010, p. 37)

4. Institutional dimension:

The institutional dimension addresses the institutions that play a key role in transforming knowledge into marketable products. This dimension includes public policies, educational institutions, research and development centers, and companies that contribute to the production and distribution of knowledge. Institutions in the knowledge economy require governments to establish policies that encourage research and development and stimulate investment in information and communications technology. Collaboration between universities and industries is also considered a key factor in enhancing the production and effective use of knowledge (Baloul, 2009, p. 21).

5. Cultural dimension:

The cultural dimension of the knowledge economy relates to changing values and practices that support innovation and continuous learning. A knowledge culture contributes to creating an environment that encourages the exchange of ideas and knowledge. In this context, societies that celebrate learning and innovation are the ones that can achieve success in the knowledge economy. A digital culture requires openness to new technologies and enhanced communication between individuals and organizations (Arab Monetary Fund, 2014, p. 50).

Second: Human capital in the knowledge age

Definition of human capital

Human capital is the set of skills, knowledge, and abilities possessed by individuals that can contribute to productivity and economic growth at the individual, organizational, and societal levels. Human capital includes the intellectual and educational capabilities, practical experience, technical skills, as well as the social and innovative capabilities that individuals possess in various work environments. Human capital is viewed as the most important resource in a knowledge economy, where the success of most organizations depends on the competence of individuals and their ability to apply knowledge in innovative and effective ways.

According to researcher Al-Mufarji (2008), human capital is not limited to academic education or technical skills, but also includes social networks and the ability to communicate and interact with others. He also points out that developing human capital requires continuous investment in education, training, and practices that enhance these capabilities. This type of capital is considered invisible but essential for achieving sustainable success in contemporary markets (Al-Mufarji, 2008, p. 24).

On the other hand, Abu Baidar (2007) points out that human capital is not static, but rather continually evolves through learning and practical experience. In the digital age, it has become important to periodically update individuals' skills to keep pace with rapid changes in technology and the economy. He emphasized that investing in human capital through training and continuing education enhances the competitiveness of companies and countries (Abu Baidar, 2007, p. 11).

The role of education in developing human capital

Education is a key factor in developing human capital, contributing significantly to improving the skills, knowledge, and capabilities of individuals, enhancing their ability to adapt to economic and social challenges. Education can be viewed as a pivotal tool in human capital development, as it provides individuals with the foundations and knowledge that enable them to increase their productivity and make effective contributions to their community or workplace.

1. Education as a source of knowledge and skills:

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Education provides individuals with the academic and technical knowledge that enables them to interact effectively with the economic and social environment. Education also enhances mental and innovative abilities, which helps individuals think critically, solve problems, and make informed decisions. Researcher Al-Sabbagh and Muhabbak (2011) assert that education, particularly in technical and scientific fields, contributes to the development of skills that are essential for innovation and economic growth in the digital age (Al-Sabbagh and Muhabbak, 2011, p. 105).

2. Continuous education and adaptation to technological changes:

With the rapid development of technology, it has become essential for individuals to continuously engage in educational and training programs in order to keep pace with technological changes. Al-Khalayleh (2006) points out that continuing education enhances individuals' ability to develop their skills and acquire new ones, which enhances their ability to innovate and operate efficiently in advanced work environments. The knowledge economy requires this type of education to prepare individuals to face the challenges arising from modern technologies such as artificial intelligence and big data (Al-Khalayleh, 2006, p. 26).

3. Higher education and entrepreneurship:

Higher education contributes to the development of human capital by stimulating individuals to think entrepreneurially. A study by Al-Dhiabat (2007) indicates that universities and higher institutes provide an educational environment that encourages innovation and the development of entrepreneurial projects based on advanced knowledge and skills. Higher education creates opportunities for individuals to develop new ideas that contribute to economic and social progress. It also enhances individuals' ability to launch start-up companies that rely on technology and knowledge as primary sources of growth (Al-Dhiabat, 2007, p. 17).

4. The role of education in promoting social justice:

Education is an effective means of achieving social justice by providing equal opportunities for all individuals in society to develop their skills and increase their economic opportunities. According to researcher Al-Kubaisi (2005), education enhances individuals' ability to improve their social and economic status and reduces the gap between different social classes. Education helps provide employment opportunities for individuals by providing the skills required in the labor market, thus contributing to the creation of a society with equal economic opportunities (Al-Kubaisi, 2005, p. 13).

Third: Transforming educational systems in the digital age

The transformation of educational systems refers to a comprehensive restructuring of the philosophy, objectives, curricula, and methods of education, so that they adapt to the requirements of the digital economy and the knowledge society. This transformation includes modernizing educational infrastructure, adopting interactive and technological teaching methods, and redefining the roles of teachers and learners, ensuring the use of digital capabilities and artificial intelligence to support the teaching and learning process. Al-Azzawi and Al-Dami emphasize that transforming the educational system does not simply mean introducing technology, but rather requires a profound cultural change in how policies are designed and educational performance is evaluated (Al-Azzawi and Al-Dami, 2010, p. 32).

Dimensions of digital transformation in education

Digital transformation in education has several interconnected dimensions, the most prominent of which are: the technological dimension, represented by the use of e-learning tools and platforms and artificial intelligence; the pedagogical dimension, manifested in the development of modern education strategies based on active and personalized learning; the institutional dimension, which focuses on governance and the development of digital infrastructure; and the social dimension, which is concerned with ensuring the inclusiveness of digital education for all groups. The UNESCO report indicated (UNESCO) indicates that the digital transformation in education requires an integrated approach that takes into account these dimensions to achieve more comprehensive and quality education (Al-Sheikh and Al-Qudat, 2007, p. 19)

The impact of digital transformation on higher education

Digital transformation has had a profound impact on higher education institutions, transforming traditional teaching models into more flexible and interactive learning environments. E-learning and blended learning have become an effective alternative to traditional lectures, providing greater access to higher education, especially during crises such as the COVID-19 pandemic. Digital transformation has also led to the emergence of new academic specializations related to big data, cybersecurity, and programming. A study confirms thatSalmi: "The digital transformation has increased the ability of universities to expand and innovate, but at the same time it requires reconsidering the roles of teachers and assessment methods" (Moatamen, 2004, p. 39).

The topicThird: Research methodology and procedures

First: Research methodology

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To achieve the research objectives, it is necessary to use a specific scientific methodology. The researcher used the descriptive method, as it is not limited to collecting data only, but rather works to interpret it. It is considered of high importance and value and more appropriate and used with the current research variable in describing the problem, which helps him in taking the right measures, processing the data, and reaching the results.

Second: Research community

The current research community consists of (100) employees and lecturers of the College of Engineering at Thi Qar University for the academic year (2024-2025), including both genders from various administrative and scientific departments within the college. This community was chosen due to the availability of an educational and administrative environment that is directly affected by the variables of digital transformation and the knowledge economy, which makes it suitable for testing the research hypotheses and achieving its objectives..

Third: Research sample

A research sample refers to a part of the research community that is chosen in a way that enables it to be accurately represented, allowing the results of the study to be generalized to the original community on which the research was conducted.

Table (1)
Shows the research sample

Number of females	Number of males	Research sample
50	**50**	**100**

The researcher selected a random sample of (100) employees and lecturers from the College of Engineering at Thi Qar University, who were selected in a simple random way to ensure neutrality and diversity. The sample was distributed equally between males and females, as the number of males was (50) employees and lecturers, and the number of females was (50) employees and lecturers, as shown in Table No. (1).

Fourth: Search tool

To achieve the objectives of the current research, the researcherI adoptScale after consulting a group of arbitrators inAdministration and EconomicsThe scale is made up of (18) A paragraph where the paragraphs included the knowledge economy, the transformation of educational systems, and strategies for building human capital in the digital age..

In order to achieve the research objectives, the researcher prepared the questionnaire as a research tool. It was prepared according to the following steps:

I. Survey questionnaire:

The researcher prepared an open questionnaire consisting of one question, which was directed to a survey sample of employees and instructors of the College of Engineering at Thi Qar University, who were randomly selected, and their number reached (20) participants, (10) males and (10) females, outside the main sample of the research. This procedure aimed to test the clarity of the question and its suitability to the objectives of the study before applying it to the main sample.

II. Preparing the questionnaire in its initial form:

YConsiderquestionnaireheOne of the scientific methodsMost used inObtaining information and data related to conditionsSample

After obtaining the initial data from the survey study, the researcher transcribed the data, in addition to the sources and similar studies. A set of paragraphs was formulated.andHe reachedNumber (18) paragraph,After presenting the paragraphs to the experts, they remained as they were, without any deletions, with minor modifications to the wording.

III. Honesty:

sheThe degree to which the scale is designed to measure, i.e. its ability to measure what it was designed for.Measure it,Or the characteristic to be measured.

in order toVerify the validity of the toolThe researcher relied onApparent validity is achieved by presenting the questionnaire items to a group of people.arbitratorsAnd specialists in the field of science, to express their opinions

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on the validity of the tool, and after collectingThe arbitrators' opinionand analysisParagraphs All paragraphs have been validated according toOpinions of thearbitratorsand their comments

IV. Correcting the questionnaire

It means that the students answer each paragraph and extract the total score by adding the answer scores on the scale. To achieve this, the researcher specifiedCorrection keyfiveGradual preparation of the scale paragraphs, as it was placedfiveAlternative answers for each paragraph are the difficulties to a degree.(I completely agree, I strongly agree, I moderately agree, I slightly agree, I do not agree at all) and the weights of the alternatives were (1, 2, 3, 4, 5).

stability:

The researcher used the test-retest method (Test-Retest) to verify the reliability of the research tool, where the questionnaire was applied to a random sample of employees and lecturers of the College of Engineering at Thi Qar University, numbering (30) participants. After two weeks, the researcher reapplied the questionnaire to the same sample. The reliability coefficient reached (0.86), which is considered a good coefficient and indicates that the tool has a high degree of consistency and stability in measurement over time.

Fifth: Application of the tool:

After verifying the validity and reliability of the tool, the tool was applied to the final basic research sample consisting of (100)participant

Sixth: Statistical methods:

Pearson's correlation coefficient was used, and The weighted mean equation for arranging the axes and paragraphs according to the research sample's answers, the percentage weight, the arithmetic mean, the variance, and the Pearson's correlation coefficient to extract the questionnaire analysis, and the t-test for two independent samples.

The topicFourthPresentation, interpretation and discussion of results

The results reached by the researcher during the current research will be presented according to the objective, its interpretation, and the results will be discussed.

Research objective: To identifyKnowledge Economy and Transformation of Education Systems: Strategies for Building Human Capital in the Digital Age To understand the knowledge economy and the transformation of educational systems, strategies for building human capital in the digital ageBy extracting the weighted mean and percentage weight for each paragraph according to the paragraph sequence in the questionnaire, as shown in Table (3).

Table (3)
Sequence of questionnaire items (Knowledge Economy and Transformation of Educational Systems: Strategies for Building Human Capital in the Digital Age) according to the weighted mean and percentage weight

Weight percent	weighted mean	Paragraph sequence in the questionnaire	Paragraphs	T
68.8	3.44	3	I believe that digital education strategies contribute significantly to the development of human capital in the era of the knowledge economy.	1
79.2	3.96	4	I believe the human capital building strategy in the College of Engineering needs more focus on digital education.	2
77.6	3.88	5	I believe the knowledge economy plays a huge role in improving the educational decision-making process in college.	3
76.8	3.84	6	I believe that the digital transformation in education contributes to improving the quality of education in the College of Engineering.	4

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76.6	3.83	7	I believe that the digital transformation in education enhances students' ability to think critically and analytically.	5
76.2	3.81	8	I believe that digital transformation helps significantly develop the capabilities of teachers in the College of Engineering.	6
76.2	3.81	5	I believe that e-learning has become one of the main pillars of higher education development in the digital economy.	7
76	3.80	15	I believe universities need to increase their investment in digital technology tools to improve the education system.	8
76	3.52	16	The transformation of educational systems into digital learning contributes to enabling students to achieve effective self-learning.	9
61.6	3.08	14	Technological tools contribute to enhancing the quality of university education and teaching students 21st century skills.	10
59,64	2.98	6	E-learning technologies contribute to improving students' ability to interact with educational content.	11
58.6	2.93	13	Educational technology contributes to providing flexible learning environments that adapt to the needs of students in the College of Engineering.	12
57.8	2.89	7	Students in the College of Engineering are showing increasing interest in using technology to improve their academic performance.	13
56.6	2.83	9	Students in the College of Engineering possess the skills to use technology effectively in their learning.	14
53.8	2.69	8	Student participation in digital educational activities contributes to raising the standards of teaching and learning at the college.	15
55	2.75	10	Faculty in the College of Engineering must improve their digital skills to keep pace with the digital transformation in education.	16
54.6	2.73	11	The use of digital learning tools is essential to developing students' skills in the College of Engineering.	17
52	2.60	1	The use of e-learning platforms is an essential part of the education strategy at the College of Engineering.	18

The survey results showed that participants strongly agreed with the importance of digital education strategies in developing human capital in the era of the knowledge economy, with a 68.8% approval rate and a weighted mean of 3.44. This result reflects a widespread awareness among College of Engineering participants that digital education has become a key component in improving the skills and knowledge that constitute human capital in the digital age..

This idea was confirmed by the paragraph indicating the need for the College of Engineering to focus on strategies for building human capital through digital education, with a 79.2% approval rate and a weighted mean of 3.96. This result demonstrates a high awareness of the importance of developing digital educational strategies to support students' personal and academic growth..

The results also showed that participants believe the knowledge economy plays a significant role in improving educational decision-making. The approval rate for this item reached 77.6%, with a weighted mean of 3.88. This indicates that participants recognize the importance of integrating the knowledge economy into decision-making in educational institutions, which enhances the ability to make strategic decisions related to the development of university education..

The following paragraphs also demonstrate agreement on the importance of digital transformation in improving the quality of education in the College of Engineering. For example, the paragraph regarding improving the quality of education in the college thanks to digital transformation showed 76.8% agreement (weighted mean 3.84), indicating that participants believe that digitalization has a positive impact on the continuous improvement of academic education..

Regarding the impact of digital transformation on students' critical and analytical thinking abilities, the results showed that 76.6% of participants strongly agreed that digital transformation enhances these abilities. This indicates that educational technology contributes to developing students' critical thinking skills, which reinforces modern educational strategies for enhancing analytical abilities..

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Regarding developing the capabilities of college teachers, the results showed a high level of agreement, at 76.2% (weighted mean 3.81), that digital transformation helps teachers improve their academic performance. This result underscores the importance of providing teachers with advanced technological tools to modernize teaching methods and enhance their efficiency..
On the other hand, the results showed that 76% of participants agreed (weighted mean 3.80) that universities should increase their investment in digital technology tools to improve education. This paragraph indicates a recognition of the ongoing need for universities to renew their investments in educational technology to increase teaching effectiveness..
As for the paragraph related to educational technology and providing flexible learning environments, it showed an approval rate of 58.6% (weighted mean 2.93), indicating that there is a greater need to provide learning environments that are more flexible and adaptable to students' needs, which constitutes an existing challenge in educational institutions..
Regarding student participation in digital educational activities, the results showed 53.8% agreement (weighted mean 2.69), which means that there is room to improve this participation by increasing e-learning activities and targeted digital programs..

Finally, the results showed that e-learning platforms are an essential part of the college's education strategy, but their effective use still needs improvement. The paragraph addressing the importance of e-learning platforms in improving education at the college showed 52% agreement (weighted mean 2.60), indicating that although participants recognize the importance of e-platforms, their use still faces some challenges..
These findings indicate that digital learning and digital transformation in education are essential elements for improving human capital and the quality of education in the College of Engineering. However, there is a clear need to further enhance the use of these digital tools by developing e-learning platforms and expanding student participation in digital learning activities. Improving the digital skills of students and teachers is also vital to keeping pace with the digital transformation in higher education.

CONCLUSIONS

1. The results showed that participants recognize the importance of investing in digital education tools, but there is a gap in the practical application of using these tools effectively within classrooms..
2. The level of student engagement in digital learning activities remains average, indicating the need to further motivate students to actively participate in digital learning environments..
3. The digital skills of students and faculty members need further development to keep pace with rapid technological changes and ensure the most effective use of available digital capabilities.
4. There is a belief that digital transformation contributes to improving the quality of higher education, especially in the College of Engineering, by enhancing critical and analytical thinking among students and developing the performance of the faculty..
5. Sample members demonstrate a high awareness of the importance of digital education in developing human capital, reflecting an advanced understanding of the role of technology in improving educational outcomes in the era of the knowledge economy..

RECOMMENDATIONS

1. Conducting periodic studies to measure the impact of digital transformation on students' academic and professional performance, to guide future educational policies based on realistic data..
2. Activating digital educational activities within the college more broadly, and encouraging students to participate in them through incentives and assessments that focus on digital interaction..
3. Directing university investments toward improving digital infrastructure and providing modern and flexible e-learning platforms that meet students' needs and specializations..
4. Increasing reliance on digital education strategies within the college's plans, and linking them to human capital development goals in a systematic and sustainable manner..
5. The need to enhance training programs dedicated to students and faculty members aimed at developing digital skills, to ensure positive interaction with modern learning tools..

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