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Achieving Academic Efficiency in Light of Digital Transformation Requirements: An Exploratory Study from the Perspective of Students in Selected Colleges of Nawroz University

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Abstract: The study aimed to explore the impact of digital transformation requirements on achieving academic efficiency, focusing on five key requirements: leadership support, infrastructure, resource mobilization, digital technologies, and organizational culture. The research was conducted on a sample of students from the colleges of Nawroz University, using a questionnaire for data collection and analysis through various statistical methods. The study used a descriptive-analytical approach. The results revealed that digital technologies were the most influential factor in achieving academic efficiency, significantly improving the learning experience and enhancing the efficiency of educational processes. The study also highlighted the importance of integrating other requirements, such as leadership support and infrastructure development, to ensure effective digital transformation. The study concluded with several recommendations, most notably the necessity of increasing investment in digital technologies, developing training programs for students and faculty members, and improving technical infrastructure. It also emphasized adopting comprehensive strategies for resource mobilization and fostering an organizational culture supportive of digital transformation. The study underscores the significance of digital transformation as a strategic factor in improving academic efficiency, noting that the integrated implementation of these requirements can contribute to achieving higher academic excellence.

تحقيق الكفاءة الأكاديمية في ضوء متطلبات التحول الرقمي: دراسة استكشافية من منظور الطلاب في كليات مختارة من جامعة نوروز

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المستخلص

هدفت الدراسة إلى استكشاف أثر متطلبات التحول الرقمي على تحقيق الكفاءة الأكاديمية، بالتركيز على خمسة متطلبات رئيسية: دعم القيادة، والبنية التحتية، وتعبئة الموارد، والتقنيات الرقمية، والثقافة التنظيمية. أُجري البحث على عينة من طلاب كليات جامعة نوروز، باستخدام استبيان لجمع البيانات وتحليلها من خلال أساليب إحصائية متنوعة. واتبعت الدراسة المنهج الوصفي التحليلي. وكشفت النتائج أن التقنيات الرقمية كانت العامل الأكثر تأثيرًا في تحقيق الكفاءة الأكاديمية، مما أدى إلى تحسين تجربة التعلم بشكل ملحوظ، وتعزيز كفاءة العمليات التعليمية. كما أبرزت الدراسة أهمية دمج متطلبات أخرى، مثل دعم القيادة وتطوير البنية التحتية، لضمان تحول رقمي فعال. وخلصت الدراسة إلى عدة توصيات، أبرزها ضرورة زيادة الاستثمار في التقنيات الرقمية، وتطوير برامج تدريبية للطلاب وأعضاء هيئة التدريس، وتحسين البنية التحتية التقنية. كما أكدت على تبني استراتيجيات شاملة لتعبئة الموارد، وتعزيز ثقافة تنظيمية داعمة للتحول الرقمي. وأكدت الدراسة على أهمية التحول الرقمي كعامل استراتيجي في تحسين الكفاءة الأكاديمية، مشيرةً إلى أن التطبيق المتكامل لهذه المتطلبات يمكن أن يسهم في تحقيق تميز أكاديمي أعلى.

الكلمات المفتاحية: التحول الرقمي، الكفاءة الأكاديمية، كليات جامعة نوروز، الطلاب.

Introduction

With the rapid advancements in digital technology, digital transformation has become a key factor influencing various fields, including higher education. This transformation imposes new challenges on universities and educational institutions in terms of achieving academic efficiency and leveraging digital technologies to develop learning environments and improve educational outcomes. This is particularly evident in educational institutions like Nawroz University, where students are exposed to a variety of digital tools requiring constant adaptation to the demands of modern education (Selwyn, 2020).

Digital transformation in education presents an opportunity to create innovative learning environments where students can access diverse educational resources with greater ease and flexibility, enhancing their ability to engage with educational content in novel ways (Kirkwood & Price, 2014). However, the adoption of these technologies also raises questions about their impact on learning quality and academic efficiency, especially in

the context of universities in developing countries facing challenges in technical infrastructure and training (Redecker, 2017).

This exploratory study focuses on assessing students' perspectives at Nawroz University regarding the role of digital transformation in enhancing their academic efficiency. The aim is to understand the extent to which these technologies influence teaching and learning processes and to identify the key challenges students face in this context. This research will provide valuable insights into how academic efficiency can be enhanced amidst digital transformation, contributing to the improvement of teaching and learning strategies at the university.

Chapter One: Research Methodology

1. **Problem of the Study:** In light of the rapid developments in digital technology and the digital transformation that has become an integral part of higher education, students face increasing challenges in adapting their learning methods to achieve academic efficiency. Academic efficiency is a vital element for student success, as it reflects their ability to meet the required academic performance within a dynamically evolving, technologically advanced educational environment (Broadbent & Poon, 2015). However, digital transformation may place additional pressures on students, especially in universities lacking strong infrastructure or those that have not provided adequate training for the effective use of these tools (Johnson et al., 2016).

The problem of this study lies in the fact that digital transformation may affect academic efficiency in various ways at Nawroz University. This impact can be either through enabling students to access new educational resources or by creating obstacles due to insufficient training on these tools or a lack of technological support. There is an urgent need to explore how these digital transformations affect students' academic efficiency to identify the factors that contribute to enhancing or hindering this efficiency.

Thus, the study aims to answer the central question: How does digital transformation affect the academic efficiency of students at Nawroz University? And what challenges do students face in achieving this efficiency in the context of a changing digital environment? Through surveying the students' opinions, this research seeks to identify the key aspects that need to be developed to maximize digital transformation's benefits in enhancing academic efficiency.

2. **Importance of the Study:** The importance of this research arises from the urgent need to understand the impact of digital transformation on higher education, especially in light of the rapid technological changes occurring in academic institutions worldwide. As traditional education shifts towards digital learning environments supported by technology, there is an increasing focus on identifying the factors that influence students' academic efficiency. Academic efficiency is essential for achieving academic success, encompassing students' ability to learn effectively, manage their time, and utilize available resources to improve their academic performance (Pintrich, 2004).

This study is particularly important in the context of Nawroz University, where digital transformation is relatively new, and students may face multiple challenges in adapting to these technologies. Understanding the impact of digital transformation on academic efficiency can provide decision-makers and stakeholders in higher education with valuable insights on how to support students in achieving the best possible academic performance amid these changes (Selwyn, 2011).

The findings of this study can contribute to the development of more effective digital education strategies at Nawroz University by identifying the tools and technologies that enhance academic efficiency and avoiding obstacles that may hinder this transformation. Furthermore, this research will offer practical recommendations for improving training programs and technological development at the university, which will contribute to enhancing the quality of education and improving the learning experience for students.

3. **Objectives of the Study:** This research aims to achieve a set of objectives that help in understanding the relationship between digital transformation and academic efficiency among students at Nawroz University. These objectives are as follows:

a. Investigate how digital technologies and modern technological tools can affect students' academic performance, their ability to manage time, and their capacity to learn effectively.
b. Identify the barriers that hinder the achievement of academic efficiency, such as a lack of training on using digital technologies, technical infrastructure issues, or resistance to change among students.

c. Evaluate the extent to which students use digital tools to enhance personal learning and improve academic outcomes, taking into account individual differences among students.
d. Propose educational and technological strategies to help students maximize the benefits of digital transformation, enhancing the effectiveness of academic and technological programs at the university.
e. Investigate how digital transformation can enhance students' self-learning and academic organization skills, contributing to the achievement of academic efficiency.

4. Hypotheses of the Study

A. Correlation Hypotheses:

- **Hypothesis 1 (H1):** There is a statistically significant relationship between leadership support and digital transformation and the academic efficiency of students at Nawroz University.
- **Hypothesis 2 (H2):** There is a statistically significant relationship between the digital infrastructure at the university and the academic efficiency of students.
- **Hypothesis 3 (H3):** There is a statistically significant relationship between the use of digital technologies in education and the academic efficiency of students.
- **Hypothesis 4 (H4):** There is a statistically significant relationship between mobilizing material and human resources for digital transformation and the academic efficiency of students.
- **Hypothesis 5 (H5):** There is a statistically significant relationship between the organizational culture that supports digital transformation and the academic efficiency of students.

B. Regression Hypotheses

- **Hypothesis 1 (H1):** Leadership support for digital transformation has a positive and direct impact on the academic efficiency of students at Nawroz University.
- **Hypothesis 2 (H2):** The available digital infrastructure at the university has a positive and direct impact on the academic efficiency of students.
- **Hypothesis 3 (H3):** The use of digital technologies in education has a positive impact on the academic efficiency of students.
- **Hypothesis 4 (H4):** Mobilizing material and human resources for digital transformation has a positive impact on the academic efficiency of students.

❖ **Hypothesis 5 (H5):** The organizational culture that supports digital transformation has a positive impact on the academic efficiency of students.

5. **Study framework**: This study examines the relationship between digital transformation and academic efficiency among students, analyzing the impact of a set of independent variables related to digital transformation on academic efficiency, which is the dependent variable of the study. Digital transformation includes several key requirements: digital infrastructure, leadership support, resource mobilization, digital technologies, and organizational culture. Academic efficiency is viewed as a dependent variable that reflects the level of students' academic performance in the context of these independent variables. The study assumes that each dimension of digital transformation directly or indirectly impacts academic efficiency, and the interaction between these dimensions may either enhance or limit students' ability to achieve academic success. These hypotheses will be tested using quantitative measurement tools based on analyzing the opinions of a sample of students, aiming to determine the relationship between the variables and provide recommendations for improving academic efficiency in the context of digital transformation.

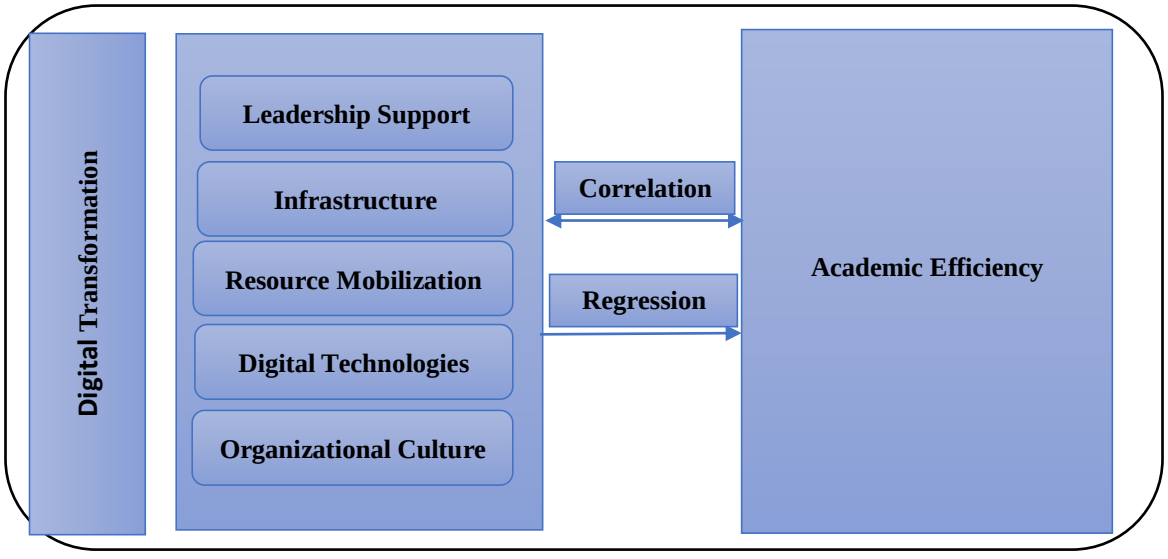

Figure (1): conceptual framework of the Study

6. **Study Limitations**

A. **Subjective Boundaries:** This research focuses on analyzing digital transformation's impact on students' academic efficiency at the University of Nawroz. The dependent variable is academic efficiency, while the independent variables include leadership support, digital infrastructure, use

of digital technologies, resource mobilization, the economic unit strategy, and organizational culture. The research does not address other factors such as the psychological and social impacts on students or the direct economic effects of digital transformation.

B. **Spatial Boundaries:** The study is conducted exclusively at the University of Nawroz, meaning the results may be limited to the nature of this university and its educational environment. Thus, the findings may not be generalizable to all universities in Iraq or elsewhere without considering contextual differences.

C. **Temporal Boundaries:** The study is restricted to a specific period during which data is collected and analyzed. This means that future changes in digital transformation policies or infrastructure may affect the study results and are not accounted for in this research.

D. **Human Boundaries:** The research is based on a specific sample of students at the University of Nawroz, which may affect the generalizability of the findings. The results might be influenced by the characteristics of this sample, such as academic level, age, and field of study, and may not necessarily reflect all student categories.

7. **Study Methodology:** The research adopts an exploratory and statistical analysis approach, which may limit the in-depth understanding of certain causal relationships between variables. Additionally, the results rely on data collected through questionnaires, which might be influenced by the impressions or opinions of students at a specific point in time.
8. **Data Collection Methods:** This research relies on a questionnaire as the primary tool for data collection from the study sample. The questionnaire will be designed to include a set of closed-ended and open-ended questions aimed at measuring the various research variables, including the dimensions of digital transformation (digital infrastructure, leadership support, resource mobilization, digital technologies, and organizational culture) and their impact on the dependent variable, academic efficiency.

The questions are constructed based on a five-point Likert scale, allowing students to indicate their level of agreement with statements related to their experience with digital transformation and its impact on their academic performance. The questionnaire will also include some demographic questions to gather information about the sample's characteristics, such as academic specialization and study level.

In addition to the questionnaire, semi-structured interviews may be conducted with some faculty members or officials responsible for digital transformation at the university to obtain deeper insights into the strategies used to support digital transformation and their impact on academic efficiency.

Chapter Two: Theoretical Framework

First: Digital Transformation

2-1. The Concept of Digital Transformation: Digital technology has permeated all aspects of life, with the use of digital transformation tools significantly increasing in recent years, especially during the COVID-19 pandemic. This surge has driven the innovation of numerous digital applications that can be utilized in diverse ways in our daily lives (Mahdi, 2023: 377). Digital transformation is an objective process and a topic of extensive discussion within the scientific community. It generally refers to the application and utilization of modern technologies in an organization's business processes to achieve its goals and enhance efficiency (Berghaus & Back, 2017: 82). There is no universally agreed-upon definition of digital transformation, as the concept is used in varying ways and contexts, making it a broad term applicable to industries, commerce, education, healthcare, and other fields. Consequently, several definitions of digital transformation have emerged. Al-Hadidi et al. (2022: 144) define digital transformation as the integration of technology into business operations, leading to a fundamental shift in how businesses are managed. Al-Sawat and Al-Harbi (2022: 652) describe it as the shift from slow, traditional work processes to fast-paced electronic work, resulting in improved efficiency and performance. Digital transformation involves not merely replicating an existing service in digital form but leveraging technology to transform that service into something significantly better (Cziesla, 2014: 29). Bekkhus (2016: 2) defines digital transformation as the use of digital technologies to radically enhance a company's performance. Stolterman and Fors (2004, p. 689) add that it refers to the changes caused or influenced by digital technology in all aspects of an employee's life. Romero et al. (2019: 1) highlight that digital transformation is a specialized type of business transformation, focusing on pursuing innovative digital or hybrid business and operational models. They emphasize that the adoption and integration of information, communication, and operational technologies play a crucial

role in a company's strategy to create new competitive advantages. These include digitally enabled internal and external operational capabilities aimed at generating value for customers, employees, and other stakeholders. Each definition of digital transformation varies based on the nature of the organization. However, the key components are likely to include rethinking business models, altering the core technology stack, innovating through customer experience, and potentially reshaping the organization's culture (Parviainen et al., 2017: 22).

Based on this, the researchers believe that digital transformation is a comprehensive process involving the integration of digital technology into all aspects of institutional life. This leads to fundamental changes in how businesses are managed, services are delivered, and goals are achieved, Digital transformation goes beyond merely adopting.

2-2. Objectives of Digital Transformation: Many studies and previous literature have highlighted that digital transformation encompasses various objectives centered on enabling institutions to create value through digital thinking and advanced innovations in presenting products and services. This is achieved by utilizing new business models based on modern, innovative technologies that align with the new demands and behaviors of society. The general objectives of digital transformation can be summarized as follows (Hamoud & Hamza, 2022: 1409):

1. Driving institutions to adopt an approach that establishes a clear transformation strategy and provides a transparent vision of the commitment of all stakeholders.
2. Achieving comprehensive development by enhancing the speed and efficiency of financial operations and services, ensuring their delivery to customers affordably and with ease.
3. Conducting business with greater transparency and simplifying the presentation of information to customers, citizens, and suppliers.
4. Reducing high costs associated with international transfers.
5. Maximizing efficiency and transparency in government operations, which supports the reduction of corruption.
6. Accelerating social and humanitarian transfers.
7. Continuous development and building massive knowledge and expertise.

8. Employing new digital technologies to optimize organizational operations, achieve innovative levels of performance, and enhance business models and production services.

2-3. Requirements for Digital Transformation: Most studies have outlined the requirements for digital transformation technologies as follows (Jasim, 2023, p. 146; Al-Dulaimi, 2023: 398):

A. **Leadership Support:** Leadership support involves the presence of strategic leaders within the organization who provide the necessary backing for projects closely aligned with broader organizational goals. Implementing digital transformation requires continuous leadership and managerial support, focusing on administrative practices linked to technology and the effective allocation of financial and human resources, along with necessary regulations.

B. **b. Infrastructure:** Infrastructure encompasses a variety of systems and structures that require physical components. Appropriate infrastructure enhances an organization's digital transformation capabilities. Investments in infrastructure tend to be costly and capital-intensive but are essential for the region's economic development and prosperity. Infrastructure improvement projects can be funded publicly or privately.

C. **c. Resource Mobilization:** Resource mobilization refers to all activities involved in securing new and additional resources for the organization. It also includes better utilization and optimization of existing resources. Often referred to as "new business development," resource mobilization is crucial for any organization as it ensures the continuity of its services to customers, supports organizational sustainability, and enables the improvement and expansion of products and services.

D. **d. Digital Technologies:** Digital technologies include the Internet of Things (IoT), mobile devices, 3D printers, big data, artificial intelligence, and cloud computing within business models in many economic units. Central to all digital transformation efforts is the continuous investment in IT defense mechanisms. The emergence of digital security networks allows independent security solutions to work together, enhancing an organization's overall security posture.

E. **Organizational Culture:** Culture reflects the prevailing state of societies that has been ingrained over successive periods, representing the behavior practiced by individuals within those societies. Organizational culture is

defined as a set of principles, values, and shared concepts among the leaders and veteran employees of an economic unit, which are passed on to and taught to new members. It consists of dominant and prevailing values that help create integration within the economic unit. To implement digital transformation, the prevailing organizational culture must be changed by promoting a culture of technology and internet use. This requires altering and managing culture as a competitive advantage, necessitating an organizational culture that fosters accountability and openness.

2-4. Types of Digital Transformation: Digital transformation takes various forms, with the most common being: (Al-Dulaimi, 2023: 399)

A. **Mobile Applications:** Mobile applications are among the most prevalent and widely used technologies today. Economic units can create various custom applications to manage their activities and provide services to both members and beneficiaries.

B. **Cloud Computing:** Cloud computing refers to computer systems and resources available on-demand via the internet, offering a range of integrated computing services. These include providing storage space, backup, and automatic synchronization, as well as software processing capabilities, email management, printing, and remote access.

C. **Internet of Things (IoT):** IoT refers to a network of physical devices, equipment, household appliances, and other electronic gadgets such as computers, sensors, and motors, which can connect and exchange data with one another.

D. **Artificial Intelligence (AI):** Artificial intelligence involves the ability of certain software and computer systems to mimic human behavior and cognitive abilities, especially the capacity for learning and reasoning. These programs process and understand their surrounding environments, helping to find solutions to problems they encounter and mitigate them.

2-5. Core Components of Digital Transformation: Research has shown that some components of digital transformation focus on the organizational aspect, while others emphasize the integrative contexts between these dimensions. Some also highlight the organizational competencies that digital transformation will achieve. Below is a brief outline of these components: (Bres and Jaber, 208)

A. **Digital Technologies:** Digital technologies such as the Internet of Things (IoT), mobile devices, 3D printers, big data, artificial intelligence, and cloud

computing are integrated into business models across many organizations and companies.

B. **Digital Strategy:** Digital strategy represents a set of organizational processes, goals, and issues related to digital transformation.

C. **Predictive and Analytical Capabilities:** For an organization to be digitally mature, it must have the ability to predict environmental conditions and adapt to them quickly.

D. **Digitalization of Customers and Their Relationships:** This dimension covers all aspects related to customer relationships and how digital technological advancements impact these relationships.

E. **Culture and People:** Dealing with the prevailing culture in society is one of the major challenges organizations face during digital transformation. Culture plays a crucial role in shaping attitudes and behaviors related to organizational **performance**.

F. **Network Relationships:** An organization striving for digital development must be a part of a network that includes suppliers, startups, governments, investors, and universities. Digital technologies interact significantly with these players through communication technologies that operate at high levels of speed, accuracy, and connectivity.

G. **New Digital Business Models:** Organizations with digital maturity can create new competitive business models. Integrated digital technologies enable organizations to develop their offerings.

2-6. Concept of Academic Competence: The term competence is considered a recent addition to the management vocabulary, though it is not a new concept. What is new is the significant role it has gained in modern management practices. A new approach has emerged in management that presents the development and growth of human resources as a fundamental pillar of an organization's competitive ability, ensuring its survival and growth. Its use coincided with the emergence of terms such as human capital, intellectual capital, social capital, and organizational capital, which refer to the totality of human abilities, creative and innovative ideas, and the practice of these capabilities within a social environment and organizational framework. Competence has become central to human resource management activities and has acquired a key role in an organization's strategy, as well as in the management, qualification, and development of its human resources, serving as an important indicator of intangible resources (Abd al-Qader,

2011: 47). Competence is a term that can be inferred and measured by forming the ratio of job output to total inputs (Zainal & Ismail, 2010: 54). According to (Al-Swat & Al-Harbi, 2022: 661), competence refers to mastering work at a high level of quality while ensuring that the organization keeps up with available resources and overcomes the challenges that stand in the way of progress and achieving goals.

Academic competence refers to an individual's knowledge and confidence in their ability to perform specific academic tasks at a certain level and efficiently control events that affect their academic achievement. It involves predicting the effort and perseverance required to face difficulties and overcome obstacles (Sabri, 2005: 71). Academic competence also refers to the university teacher's knowledge, which enables them to manage their students' learning, including the ability to understand them, design and implement learning activities, and evaluate the results to help students reach their potential and acquire the knowledge and skills needed to support their learning (Ahmed & Ibrahim, 2021: 8). Academic competence for university teachers summarizes the essential professional and personal skills and academic behavioral patterns. It forms the basis for any refined academic behavior and successful performance in the profession (Hassan & Abdulwahid, 2021: 5). According to international higher education standards, the university teacher is the most important and accessible knowledge and skill source for most students. Thus, they are viewed as a qualified professional, both theoretically and practically, capable of deep and critical analysis of educational phenomena (Enqua, 2009: 18).

It is worth noting that the various definitions of competence, based on what has been presented, indicate that researchers have pointed to expected sources of competence. They see the term competence as broad, encompassing different perspectives defining this concept. Competence includes a wide range of knowledge, attitudes, and observable behavioral patterns, which represent the ability to provide a professional service that enables an individual to perform various tasks correctly (Gibb, 2013: 17).

Based on this, the researchers define academic competence as the ability to achieve success in the educational environment, reflecting the students' level of educational performance through a variety of factors and criteria. Academic competence includes students' ability to absorb

information, apply theoretical concepts, and achieve the required academic goals across various academic disciplines.

Chapter Three: The Field Framework of the Study

First: Research Population and Sample

A. The research population in this study consists of students at the University of Nawroz, selected to represent a group of students who are increasingly exposed to digital transformation in the educational process. The population includes students from various academic disciplines and levels, ensuring a diverse representation of different educational experiences under digital transformation.

B. As for the study sample, a random sample of 100 students was selected, and research questionnaires were distributed to this sample. A total of 79 valid questionnaires were retrieved for analysis. The sample included all students who met the study's criteria and were selected randomly to ensure the sample's representativeness of the population. The overall response rate of the questionnaires was 79%, which is a good percentage reflecting the students' cooperation in participating in the study.

C. Table (1) shows the distribution of the respondents based on their characteristics. The majority of the sample were females, representing 60.8%. Regarding age, the majority were in the age group of 22 years and above, with 62%. As for the college, students from the Faculty of Law and Political Science formed the majority, representing 43%. Regarding academic level, it is clear from the table that most of the respondents were in the third year, with a percentage of 70.9%.

Table (1): Description of Respondents Based on Their Characteristics

Characteristic	Category	Frequency	Percentage (%)
Gender	Female	48	60.8
	Male	31	39.2
Age	Less than 22 years	30	38.0
	22 years and above	49	62.0
College	Faculty of Law and Political Science	34	43.0
	Other Faculties	45	57.0
Academic Level	Third Year	56	70.9
	Other Levels	23	29.1

Source: by researchers

This table summarizes the distribution of the study sample by individual characteristics, highlighting the diversity and composition of the respondents in terms of gender, age, faculty, and academic level.

Second: Diagnosing the opinions of the respondents towards the digital transformation variable

Table (2) shows the percentages of frequency distributions, arithmetic means, standard deviations and the coefficient of variation of the respondents' answers to the paragraphs that measure the levels of digital transformation among the respondents. From the analysis of the data in the table, the following becomes clear:

1. Digital transformation: The results in Table (2) indicate that the respondents' answers, at the overall level of the colleges surveyed, regarding this variable with its indicators (X20 - X1), tend towards agreement on the availability of digital transformation among them, at a rate of (53.43%) of those answers, while the percentage of neutrality reached (21.28%), while the percentage of disagreement with this variable reached (26.66%). With an arithmetic mean of (3.36) and a standard deviation of (1.23). Therefore, this result indicates that the level of digital transformation among the respondents is average.
2. As for the level of digital transformation requirements, it was found that the first requirement (leadership support) obtained the highest level with an arithmetic mean of (3.58) and a standard deviation of (1.1).
3. Followed by the second requirement (leadership support) in shaping digital transformation according to the respondents' answers with an arithmetic mean (3.48), and a standard deviation (1.2).
4. As for the fourth, fifth, and third requirements for digital transformation, represented by (digital technologies), (organizational culture), (mobilization of resources), they are available to a similar degree according to the respondents' answers, as their arithmetic mean is (3.36), (3.23), (3.18) respectively and with a standard deviation of (1.2), (1.3), (1.2) respectively.

Table (2): Levels of Digital Transformation Among Respondents

Variable	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Std. Deviation
X1	23 (29.1%)	33 (41.8%)	16 (20.3%)	7 (8.9%)	-	3.91	0.9
X2	18 (22.8%)	32 (40.5%)	10 (12.7%)	12 (15.2%)	7 (8.9%)	3.53	1.2
X3	8 (10.1%)	36 (45.6%)	15 (19.0%)	14 (17.7%)	6 (7.6%)	3.33	1.1
X4	21 (26.6%)	22 (27.8%)	20 (25.3%)	12 (15.2%)	4 (5.1%)	3.56	1.1
Overall Leadership Support Index	-	-	-	-	-	3.58	1.1
X5	20 (25.3%)	36 (45.6%)	4 (5.1%)	8 (10.1%)	11 (13.9%)	3.58	1.3
X6	16 (20.3%)	36 (45.6%)	12 (15.2%)	4 (5.1%)	11 (13.9%)	3.53	1.2
X7	16 (20.3%)	32 (40.5%)	20 (25.3%)	2 (2.5%)	9 (11.4%)	3.56	1.1
X8	12 (15.2%)	20 (25.3%)	28 (35.4%)	16 (20.3%)	3 (3.8%)	3.28	1.0
Overall Infrastructure Index	-	-	-	-	-	3.48	1.2
X9	8 (10.1%)	24 (30.4%)	24 (30.4%)	13 (16.5%)	10 (12.7%)	3.09	1.1
X10	12 (15.2%)	23 (29.1%)	24 (30.4%)	11 (13.9%)	9 (11.4%)	3.23	1.0
X11	16 (20.3%)	18 (22.8%)	17 (21.5%)	15 (19.0%)	13 (16.5%)	3.11	1.3
X12	23 (29.1%)	13 (16.5%)	19 (24.1%)	12 (15.2%)	12 (15.2%)	3.29	1.4
Overall Resource Mobilization Index	-	-	-	-	-	3.18	1.2
X13	12 (15.2%)	28 (35.4%)	12 (15.2%)	15 (19.0%)	12 (15.2%)	3.16	1.3
X14	16 (20.3%)	36 (45.6%)	16 (20.3%)	-	11 (13.9%)	3.58	1.2
X15	20 (25.3%)	32 (40.5%)	12 (15.2%)	4 (5.1%)	11 (13.9%)	3.58	1.3
X16	12 (15.2%)	27 (34.2%)	12 (15.2%)	16 (20.3%)	12 (15.2%)	3.14	1.3
Overall Digital Technologies Index	-	-	-	-	-	3.36	1.2
X17	27 (34.2%)	12 (15.2%)	24 (30.4%)	8 (10.1%)	8 (10.1%)	3.53	1.3
X18	20 (25.3%)	20 (25.3%)	15 (19.0%)	16 (20.3%)	8 (10.1%)	3.35	1.3
X19	12 (15.2%)	20 (25.3%)	16 (20.3%)	16 (20.3%)	15 (19.0%)	2.97	1.3
X20	12 (15.2%)	20 (25.3%)	20 (25.3%)	16 (20.3%)	11 (13.9%)	3.08	1.2
Overall Organizational Culture Index	-	-	-	-	-	3.23	1.3
Average	-	20.5	-	32.9	-	3.36	1.2
Overall Digital Transformation Index	-	-	-	-	-	53.43	-

Source: Prepared by the researchers based on the results of the statistical program (SPSS).

Third: Diagnosis of Respondents' Opinions on the Academic Competence Variable

Table (3) shows the percentage of frequency distributions, mean scores, and standard deviations of respondents' opinions regarding the levels of academic competence. Analyzing the table's data reveals the following:

1. **Academic Competence**: The results in Table (3) indicate that respondents' answers, on the overall level for the studied colleges, regarding this variable and its indicators (Y10 – Y1) tend toward agreement on the availability of academic competence. This is evident in 66.72**%** of the responses, while **11.41%** were neutral. Meanwhile, the percentage of disagreement with this variable reached 22.44**%**. The variable recorded a mean score of 3.62 and a standard deviation of 1.2. Therefore, this result indicates that the level of academic competence among the respondents is above average.
2. The best indicator that strengthened the overall index for the variable was **Y8**, which recorded a mean score of **3.76** and a standard deviation of **1.2**.

Table (3): Levels of Academic Efficiency Among Respondents

Variable	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Std. Deviation
Y1	20 (25.3%)	28 (35.4%)	16 (20.3%)	-	11 (13.9%)	3.61	1.2
Y2	20 (25.3%)	32 (40.5%)	8 (10.1%)	8 (10.1%)	11 (13.9%)	3.53	1.3
Y3	24 (30.4%)	32 (40.5%)	7 (8.9%)	8 (10.1%)	8 (10.1%)	3.71	1.2
Y4	20 (25.3%)	33 (41.8%)	10 (12.7%)	8 (10.1%)	8 (10.1%)	3.62	1.2
Y5	24 (30.4%)	21 (26.6%)	7 (8.9%)	16 (20.3%)	11 (13.9%)	3.39	1.4
Y6	20 (25.3%)	33 (41.8%)	7 (8.9%)	11 (13.9%)	8 (10.1%)	3.58	1.2
Y7	24 (30.4%)	29 (36.7%)	11 (13.9%)	4 (5.1%)	11 (13.9%)	3.65	1.3
Y8	24 (30.4%)	32 (40.5%)	11 (13.9%)	4 (5.1%)	8 (10.1%)	3.76	1.2
Y9	19 (24.1%)	38 (48.1%)	7 (8.9%)	5 (6.3%)	10 (12.7%)	3.65	1.2
Y10	30 (38%)	24 (30.4%)	6 (7.6%)	12 (15.2%)	7 (8.9%)	3.73	1.3
Average	-	-	-	-	-	3.62	1.2
Overall Academic Efficiency Index	66.72%	11.41%	22.44%	-	-	-	-
Source							

Source: by the researchers based on SPSS results.

Fourth: Analysis of the Correlation Between the Study Variables

Table (4) presents the Pearson correlation coefficients between digital transformation and academic efficiency. From examining these values, the following points are evident:

1. There is a significant positive correlation between digital transformation (overall index) and academic efficiency (overall index), as indicated by the correlation coefficient of **0.943**, which is significant at the **0.01** level. This relationship implies that improving levels of digital transformation within the responding colleges leads to enhanced levels of academic efficiency.
2. There is a significant positive correlation between each requirement of digital transformation and academic efficiency (overall index). Among these, the fourth requirement of digital transformation (digital technologies) exhibits the strongest positive and significant correlation with academic efficiency, with a correlation coefficient of **0.962**, significant at the **0.01** level. Regarding the relationships between the other digital transformation requirements (infrastructure, organizational culture, leadership support, and resource mobilization) and academic efficiency, significant positive correlations were observed, with coefficients of **0.897**, **0.881**, **0.829**, and **0.770**, respectively, all significant at the **0.01** level. Based on the above findings, it can be concluded that most of the results support the study's first main hypothesis and confirm its validity.

Table (4): Pearson Correlation Coefficients Between Digital Transformation and Academic Efficiency

Digital Transformation	Academic Efficiency (Overall Index)	Sig.
Leadership Support	0.829**	0.00
Infrastructure	0.897**	0.00
Resource Mobilization	0.770**	0.00
Digital Technologies	0.962**	0.00
Organizational Culture	0.881**	0.00
Overall Index	0.943**	0.00

P ≤ 0.01, **N = 79**

Source: Prepared by the researchers based on the results of the statistical program.

Fifth: Impact Analysis Between the Study Variables

After analyzing the relationship between digital transformation and academic efficiency, the hypotheses of the research require identifying the effect of the independent variable (digital transformation) on the dependent variable (academic efficiency) to test the second main hypothesis of the study. This is done using simple linear regression analysis (Enter method). Table (5) shows the results of the regression analysis, which indicate the following:

1. **Significant Effect of Digital Transformation on Academic Efficiency**: The results of the simple linear regression analysis show a significant effect of digital transformation on academic efficiency at the overall level (overall index) in the colleges sampled. The significance level was found to be (0.000), which is much smaller than the research's threshold significance level of (0.05). This is confirmed by the calculated F-value of (613.237), which is larger than its tabulated value of (3.97), thus confirming the significant relationship between the two variables.
2. **Regression Coefficients (β1)**: The regression coefficient (β1), which represents the slope of the regression line, was (0.943). This means that for every one-unit increase in the independent variable (digital transformation), there is an increase in the dependent variable (academic efficiency) by the same amount (β1 = 0.943). This high value confirms the strength of the effect of digital transformation on academic efficiency in the surveyed colleges. The strongest effect on academic efficiency was from the digital technologies requirement, with a Beta coefficient of (0.962). The weakest effect was from the resource mobilization requirement, with a Beta coefficient of (0.770).
3. **Coefficient of Determination (R^2)**: Based on the coefficient of determination (R^2) between digital transformation (overall index) and academic efficiency (overall index), it was found that digital transformation accounts for (88%) of the changes in academic efficiency, with the remaining changes attributed to other variables. Further analysis showed that the strongest effect on academic efficiency was from the digital technologies requirement, which accounts for (92%) of the changes in academic efficiency. The weakest effect was from the resource mobilization factor, which accounts for (59%) of the changes in academic efficiency.

Based on the above, it can be said that most of the results support the second hypothesis of the research and confirm its validity.

Table (5): Regression Analysis Results for Digital Transformation on Academic Competence

Independent Variable (Digital Transformation)	Dependent Variable (Academic Competence)	B0	B1	R^2	F	Sig.
Leadership Support	Overall Index	0.141	0.829	0.688	169.555	0.638
Infrastructure	Overall Index	0.117	0.897	0.804	316.824	0.571
Resource Mobilization	Overall Index	1.151	0.770	0.593	112.319	0.000
Digital Technologies	Overall Index	0.218	0.962	0.926	958.399	0.063
Organizational Culture	Overall Index	0.820	0.881	0.777	267.655	0.000
Overall Index	Overall Index	0.091	0.943	0.888	613.237	0.000

Degrees of Freedom (1, 77) | F Table Value = 3.97 | N = 79

Source: Prepared by the researcher based on the results of the statistical software (SPSS)

Chapter Four: Conclusions and Recommendations

First: Conclusions

1. The results of the research showed that digital technologies are the most impactful requirement for achieving academic competence. They facilitate easy access to educational resources and provide an interactive environment that supports both self-directed and collaborative learning.
2. Students emphasized the importance of leadership support in creating the necessary conditions for adopting digital transformation by providing financial and technical support, and steering policies toward innovation in education.
3. Students occasionally face challenges related to infrastructure, such as poor internet networks or a lack of digital devices, highlighting the need for additional investments to improve the quality of the technical infrastructure.

4. A positive organizational culture within the university, which supports the use of technology and encourages active student participation, is crucial to enhancing academic competence.
5. Students believe that the provision of material and human resources is clearly tied to the strategic vision for digital transformation. This requires effective management to ensure optimal use of these resources.
6. The results confirm that combining digital technologies, leadership support, and strong infrastructure contributes to greater student satisfaction with the educational process and increases the effectiveness of digital transformation.
7. Students at the University of Nowruz see digital transformation as a strategic tool for creating new opportunities in education, such as offering flexible and interactive programs that align with labor market needs.
8. To achieve academic competence in light of digital transformation, there is an urgent need to train both students and faculty members on the effective use of digital technologies.

Second: Recommendations: Based on the conclusions, the following recommendations can be proposed to enhance academic competence in light of the requirements of digital transformation:

1. **Enhancing Investment in Digital Technologies through:**

❖ Providing comprehensive and integrated digital learning platforms.
❖ Updating digital devices and technical infrastructure to ensure seamless access for all students.
❖ Using artificial intelligence systems to improve the quality of education and academic support services.

2. **Developing Continuous Training Programs through:**

❖ Organizing training courses for students and faculty members that focus on effectively using digital technologies.
❖ Holding workshops on best practices in digital education to enhance technical and creative skills.

3. **Strengthening the Role of University Leadership in Supporting Digital Transformation through:**

❖ Allocating clear and continuous budgets to support digital transformation projects.
❖ Establishing specialized units to manage digital transformation and monitor performance to achieve academic goals.

4. **Expanding Partnerships with Leading Technological Entities through:**
- ❖ Collaborating with technology companies to provide advanced programs and tools at affordable or free prices for students.
- ❖ Benefiting from innovative technological solutions offered by companies to enhance the educational process.

5. **Creating an Innovation-Encouraging Organizational Environment through:**
- ❖ Encouraging faculty members to develop educational curricula based on technology.
- ❖ Offering incentives to students and academics who innovate or contribute to the development of digital solutions.

6. **Improving Technical Infrastructure through:**
- ❖ Enhancing internet speed and quality on campus and providing free access points.
- ❖ Establishing digital laboratories equipped with the latest technologies to provide an innovative learning environment.

7. **Developing Technology-Based Evaluation Systems through:**
- ❖ Using electronic assessment systems that offer instant feedback to improve academic performance.
- ❖ Promoting the use of data analysis tools to assess student progress accurately and identify their individual needs.

8. **Launching Initiatives for Effective Resource Mobilization through:**
- ❖ Designing comprehensive strategies for managing human and financial resources to ensure the achievement of digital objectives.
- ❖ Utilizing digital platforms to engage the community and the private sector in supporting digital transformation projects.

9. **Raising Awareness about the Importance of Digital Organizational Culture through:**
- ❖ Conducting awareness campaigns within universities to explain the significance of digital transformation.
- ❖ Sharing success stories within and outside the university about the impact of digital transformation on improving academic competence.

10. **Launching Continuous Evaluation and Improvement Initiatives through:**
- ❖ Establishing periodic committees to evaluate the performance of digital projects and their impact on academic competence.

- Using the results of these evaluations to make continuous improvements in policies and procedures.

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