Journal of Scientific and Human Dimensions
مجلة الأبعاد العلمية والإنسانية
Volume 2, Issue 2, 2026 Pages: 402-416
Journal homepage: https://jshd.com.ly/index.php/jshd/en

The Impact of Digital Transformation on The Academic Work of Faculty Members at Bani Waleed University

Mohammed Abdo ulwahad AlSharaa [1*], Salem Asseed Alatresh [2], Mohyaadean Atiya Mousa[3], K. Negrat [4]
[1] Computer Department, Faculty of Education, Bani Waleed University, Bani Walid, Libya
[2,3] Computer Science Department, Faculty of Information Technology, Bani Waleed University, Bani Walid, Libya
[4] College of Electronic Technology - Bani Walid, Libya

أثر التحول الرقمي على العمل الأكاديمي لأعضاء هيئة التدريس بجامعة بني وليد

محمد عبد الواحد الشرع [1*]، سالم الصيد الأطرش [2]، محي الدين عطية موسى [3]، خالد محمد النقراط [4]
[1] قسم الحاسوب، كلية التربية، جامعة بني وليد، بني وليد، ليبيا
[2،3] قسم علوم الحاسوب، كلية تقنية المعلومات، جامعة بني وليد، ليبيا
[3] كلية التقنية الإلكترونية - بني وليد، ليبيا

[*]Corresponding author: malshara19@bwu.edu.ly

Received: March 23, 2026	Accepted: April 27, 2026	Published: May 11, 2026

Abstract:
Digital transformation has become a defining characteristic of contemporary higher education institutions, reshaping academic roles, organizational structures, and teaching practices. This study aims to analyze the impact of digital transformation on the academic work of faculty members at Bani Walid University, focusing on workload, technological stress, organizational factors, and the experience of online teaching.
The study adopted a mixed-methods approach with a sequential exploratory design. In the first phase, qualitative data were collected through semi-structured interviews with a purposive sample of faculty members to explore their experiences and identify key themes. Based on the results of this phase, a conceptual model was developed and quantitatively tested using questionnaire data from a sample of (N = 80) through structural equation modeling (SEM).
The results showed that digital transformation leads to a significant increase in academic and administrative workload (($\beta = 0.55$, $p < 0.001$), and contribute to higher levels of technological stress ($\beta = 0.52$, $p < 0.001$), especially in the context of weak infrastructure and a lack of training and technical support. Conversely, the results revealed a moderate positive impact of digital transformation on the e-teaching experience ($\beta = 0.32$, $p < 0.05$), reflecting opportunities to improve the quality of education despite the accompanying challenges. Institutional factors, such as digital infrastructure, organizational structure, and training, also play a crucial mediating role in shaping faculty experience. Furthermore, the results showed that technical expertise acts as a moderating variable, mitigating the negative impact of digital transformation on technological stress.
The study confirms that digital transformation in higher education is not merely a technological shift, but a complex institutional process involving interwoven technological, organizational, and human dimensions. Therefore, the success of this transformation requires an integrated approach that balances infrastructure development, enhanced institutional support, and the development of faculty members' digital skills. These findings offer important insights for policymakers in designing effective and sustainable strategies for digital transformation in higher education.

Keywords: Digital Transformation, Faculty, Workload, Technological Stress, Higher Education, Structural Equation Modeling.

الملخص

أصبح التحول الرقمي سمةً بارزةً من سمات مؤسسات التعليم العالي المعاصرة، إذ أعاد تشكيل الأدوار الأكاديمية والهياكل التنظيمية وممارسات التدريس. تهدف هذه الدراسة إلى تحليل أثر التحول الرقمي على العمل الأكاديمي لأعضاء هيئة التدريس بجامعة بني وليد، مع التركيز على عبء العمل، والضغط التكنولوجي، والعوامل التنظيمية، وتجربة التدريس الإلكتروني.

اعتمدت الدراسة على منهج مختلط بتصميم استكشافي تتابعي. ففي المرحلة الأولى، جُمعت البيانات النوعية من خلال مقابلات شبه منظمة مع عينة قصدية من أعضاء هيئة التدريس، وذلك لاستكشاف تجاربهم وتحديد الموضوعات الرئيسة. وبناءً على نتائج هذه المرحلة، تم تطوير نموذج مفاهيمي واختباره كميًا باستخدام بيانات استبيان جُمعت من عينة بلغ حجمها($N = 80$) ، وذلك من خلال نمذجة المعادلات الهيكلية (SEM)

أظهرت النتائج أن التحول الرقمي يؤدي إلى زيادة معنوية في عبء العمل الأكاديمي والإداري ($\beta = 0.55, p < 0.001$)، كما يسهم في ارتفاع مستويات الضغط التكنولوجي($\beta = 0.52, p < 0.001$) ، خاصة في ظل ضعف البنية التحتية ونقص التدريب والدعم الفني. وفي المقابل، كشفت النتائج عن أثر إيجابي متوسط للتحول الرقمي على تجربة التدريس الإلكتروني($\beta = 0.32, p < 0.05$) ، مما يعكس وجود فرص لتحسين جودة التعليم رغم التحديات المصاحبة. كما تؤدي العوامل المؤسسية، مثل البنية التحتية الرقمية، والهيكل التنظيمي، والتدريب، دورًا وسيطًا مهمًا في تشكيل تجربة أعضاء هيئة التدريس. علاوة على ذلك، أظهرت النتائج أن الخبرة التقنية تعمل كمتغير معدل، حيث تخفف من الأثر السلبي للتحول الرقمي على الضغط التكنولوجي.

تؤكد الدراسة أن التحول الرقمي في التعليم العالي لا يُعد مجرد تحول تكنولوجي، بل هو عملية مؤسسية معقدة تتداخل فيها الأبعاد التكنولوجية والتنظيمية والبشرية. ولذلك، فإن نجاح هذا التحول يتطلب تبني نهج متكامل يوازن بين تطوير البنية التحتية، وتعزيز الدعم المؤسسي، وتنمية المهارات الرقمية لأعضاء هيئة التدريس. وتقدم هذه النتائج رؤى مهمة لصانعي السياسات عند تصميم استراتيجيات فعالة ومستدامة للتحول الرقمي في التعليم العالي.

الكلمات المفتاحية: التحول الرقمي، أعضاء هيئة التدريس، عبء العمل، الضغط التكنولوجي، التعليم العالي، نمذجة المعادلات الهيكلية.

Introduction

Higher education institutions have undergone a radical transformation towards digitalization in recent decades, driven by rapid developments in information and communication technologies and the accompanying profound changes in the patterns of knowledge production and dissemination. Digital transformation is no longer simply about introducing technological tools into the educational environment; it has become a structural transformation that is reshaping academic roles, organizational processes, and patterns of interaction among stakeholders within the educational institution. (Selwyn, 2021; Vial, 2021).

This shift has contributed to the expansion of e-learning and blended learning, providing significant opportunities to enhance learning flexibility and improve access to knowledge. However, it has also created complex challenges related to increased workload, multitasking, and the ongoing need to develop digital skills among faculty members. Kirkwood & Price, 2014; Hodges et al., 2020).

In this context, the role of faculty members is no longer limited to teaching and research, but has expanded to include technical and administrative tasks, such as managing educational platforms, designing digital content, and providing technical support to students, leading to an overlap of boundaries between academic and administrative work. Berge, 2008; Watermeyer et al., 2021).

One of the most prominent phenomena associated with digital transformation in higher education is what is known as technological stress. Technostress), which refers to the psychological stress resulting from intensive technology use and the difficulty of adapting to its increasing demands. Numerous studies have shown that this type of stress negatively impacts job performance and job satisfaction, particularly in environments with weak institutional support or insufficient training (Tarafdar et al., 2015; Molino et al., 2020).

The literature also indicates that the multiplicity and lack of integration of digital systems can increase the complexity of the work and lead to a waste of time and effort. (Ayyagari et al., 2011; Tarafdar et al., 2015). Furthermore, organizational factors play a pivotal role in shaping the digital transformation experience within universities. The nature of the organizational structure, the level of centralization, and the clarity of institutional policies can all influence faculty members' ability to adapt to the digital environment. Recent studies have shown that institutions adopting flexible structures and clear digital transformation strategies are better

positioned to achieve positive outcomes, while weak institutional coordination leads to increased operational burdens and duplication of tasks (Vial, 2021; Hinings et al., 2018).
The availability of digital infrastructure, technical support, and ongoing training are also crucial factors in the success of digital transformation. Numerous studies have confirmed that investing in infrastructure and developing human resource capabilities directly contributes to improving the quality of e-learning and reducing the stress associated with technology use. Bond et al., 2018; Scherer et al., 2021).
Conversely, the lack of these resources hinders the full realization of the potential of digital transformation. In this context, the importance of the technical expertise of faculty members stands out as a crucial factor in determining the success of adapting to the digital environment, as studies indicate that individuals with higher digital skills are better able to deal with technical challenges and less prone to technological stress (Scherer et al., 2020; Instefjord & Munthe, 2017).
Despite the growing global literature on digital transformation in higher education, studies in the Arab context, particularly in Libya, remain limited, especially those that adopt an integrated perspective combining technological, organizational, and human dimensions in analyzing this phenomenon. Vial, 2021; Hinings et al., 2018). This research deficit is becoming increasingly important in light of the structural challenges facing Libyan universities, including weak digital infrastructure, limited institutional resources, and a lack of training and qualification programs, which may limit the effectiveness of adopting digital transformation and make its effects more complex on academic work.
Accordingly, this study aims to explore and analyze the impact of digital transformation on the academic work of faculty members at Bani Walid University. This is achieved through the development and testing of a conceptual model that explains the relationship between digital transformation and academic output. The model considers the mediating role of digital infrastructure, organizational structure, training, and technical support, as well as the modulating role of technical expertise in shaping these relationships. The study seeks to provide a comprehensive scientific understanding of this phenomenon, thereby supporting decision-makers in designing effective and sustainable digital transformation strategies for higher education institutions.

1.1 Research Questions

Main question:

What impact has digital transformation had on the nature of academic work and the experiences of faculty members at Bani Walid University in light of the various organizational and technical factors?

sub-questions:

1. What impact does digital transformation have on the academic and administrative workloads of faculty members?
2. How do organizational factors, especially organizational structure, affect the experience of using e-learning?
3. What is the nature of the relationship between digital transformation and levels of technological stress among faculty members?
4. To what extent do training and technical support contribute to improving the e-learning experience and the efficiency of technology use?
5. How does technical expertise modify the relationship between digital transformation and the outputs of academic work?

1.2 Research Hypotheses

Digital transformation in higher education is viewed as a comprehensive institutional process that goes beyond simply adopting technology. It encompasses the reshaping of organizational structures, operational processes, and the roles of actors within the academic institution. In this context, digital transformation directly and indirectly impacts the nature of academic work through a range of structural pathways that can be explored using structural equation modeling.(SEM). Based on this, the following hypotheses are developed:

- **Digital transformation and the nature of academic work**

Digital transformation refers to the integration of digital technologies into all aspects of organizational work, leading to fundamental changes in how tasks are performed and services are delivered. According to [source missing]Vial (2021), this transformation is not limited to improving efficiency, but reshapes the very nature of work by increasing complexity, expanding responsibilities, and enhancing interaction with digital systems.
In higher education, this is reflected in the changing roles of faculty members, who are now required to combine academic, technical, and administrative tasks. This impacts academic outputs, such as workload, technological strain, and the experience of online teaching. Therefore, a direct, multidimensional impact of digital transformation on these outputs is expected.
H1There is a statistically significant impact of digital transformation on the nature of academic work for faculty members.

SEM:
DT → WL, TT, TEQ

- **Digital transformation and academic workload**

The shift towards digital education has led to a redistribution of academic roles, where faculty members are no longer limited to teaching and research, but have expanded to include managing digital platforms, designing e-content, and maintaining ongoing interaction with students through digital media. The literature indicates that this expansion of responsibilities results in a significant increase in workload.
He explainedBerge (2008) argued that virtual learning environments impose additional roles on teachers, while Kirkwood & Price (2014) asserted that integrating technology does not reduce effort but rather increases the complexity of the educational process. More recent studies, such as Watermeyer et al. (2021), have also shown that digital transformation in recent times has led to increased professional stress due to digital multitasking. Therefore, digital transformation is expected to increase the academic and administrative workload.
H1a Digital transformation leads to increased academic and administrative workloads.

SEM
DT → WL

- **The role of organizational structure in the e-learning experience**

Organizational factors play a crucial role in determining the success of digital transformation within educational institutions. The nature of the organizational structure, particularly the degree of centralization, affects the flexibility of decision-making, the speed of response to change, and the ability of individuals to adapt to digital environments. The literature indicates that centralized organizational structures often hinder innovation and increase administrative complexity. According to Hinings et al. (2018) and Vial (2021), organizations with flexible structures are better equipped to embrace digital transformation and achieve positive outcomes. Conversely, centralization leads to duplication of tasks and poor coordination, negatively impacting user experience. In this context, organizational structure is considered a mediating variable linking digital transformation and the e-learning experience.
H1b Centralized organizational structures negatively impact the e-learning user experience.
SEM
DT → OS → TEQ

- **Digital infrastructure and technological stress**

The availability of digital infrastructure is a key factor in the success of digital transformation, as the quality and integration of systems affect the user experience and the level of stress associated with using technology. In environments with weak infrastructure, the likelihood of what is known as technological stress increases. (Technostress).
customTarafdar et al. (2015) defined technological stress as a state of psychological strain resulting from difficulty adapting to technological demands, while Molino et al. (2020) demonstrated that a lack of digital resources increases cognitive load and negatively impacts job performance. Therefore, it is expected that inadequate digital infrastructure leads to higher levels of technological stress, acting as a mediating variable in the relationship between digital transformation and stress.
H1c Weak digital infrastructure is linked to high levels of technological stress.
SEM
DT → DI → TT

- **Training and technical support role**

Training and technical support are crucial factors in enhancing individuals' ability to use technology effectively. Technology adoption theories suggest that institutional support contributes to reducing anxiety and increasing confidence in using digital systems.
Studies have shown that investing in continuous training leads to improved performance and reduced technical stress. Bond et al. (2018) stated that developing digital skills enhances the quality of e-learning, while Lee & Wang (2021) indicated that effective technical support contributes to improving user experience and reducing technological stress.
Therefore, training and technical support are expected to act as an intermediary variable that enhances the positive effects of digital transformation.
H1d Training and technical support contribute to improving the efficiency of technology use and reducing technical stress.
SEM
DT → TS → TEQ

TS → TT (−)

- **The corrective role of technical expertise**

Technical expertise is one of the individual factors that influence how people respond to digital transformation. The literature suggests that individuals with high digital skills are better able to adapt to digital systems and less prone to technological stress.

A study has shown Scherer et al. (2020) stated that digital competence is a crucial variable in explaining individual differences in technology use, while Instefjord & Munthe (2017) emphasized that having digital skills enhances the quality of teaching practices.

Accordingly, technical expertise is expected to play a moderating role in the relationship between digital transformation and its outcomes, mitigating negative impacts and enhancing positive ones.

H1e Technical expertise leads to an improved teaching experience and reduces the negative effects of digital transformation.

SEM

DT × TE → TT

DT × TE → TEQ

1.3 Identifying the variables

To explain the assumed relationships, the variables were defined as follows:

- **Independent variable:**

Digital transformation

- **Intermediate variables:**

Digital Infrastructure

Organizational structure

Training and technical support

- **Dependent variables:**

Academic workload

Technological stress

Online teaching experience

Efficiency in using information technology

- **The adjusted variable:**

Technical expertise

1.4 Conceptual Model

This study is based on a conceptual model that explains the direct and indirect effects of digital transformation on the nature of academic work, where digital transformation is viewed as a comprehensive institutional transformation process that goes beyond the technical dimension to include organizational, human, and interactive dimensions within the educational institution.(Verina & Titko, 2019; Vial, 2021). The model posits that the impact of digital transformation does not occur linearly, but rather through a set of mediating factors that shape the environment for interaction with technology. These factors include the quality of digital infrastructure, the nature of the organizational structure, and the level of training and technical support. These variables contribute to either enhancing or hindering faculty members' ability to adapt to the digital environment.

The literature supports this argument, indicating that the success of digital transformation depends on the interaction between technology, organizational structure, and human capabilities, and not on technology itself.(Hinnings et al., 2018; Bond et al., 2018). The model also assumes that technical expertise is a moderating variable that influences the strength and direction of the relationship between digital transformation and its outcomes. Individuals with higher levels of digital competence are better able to adapt to the demands of the digital environment, less prone to technological stress, and more capable of effectively employing technology in the educational process (Schererer et al., 2020; Instefjord & Munthe, 2017).

1.5 Structural representation of the model

The relationships can be represented as follows:

- Digital transformation ← directly impacts:

workload

Technological stress

Online teaching experience

- Digital transformation → has an indirect impact via:

Digital Infrastructure
Organizational structure
Training and technical support
• Technical expertise modifies the relationship between:
Digital transformation and its effects on (workload, technological stress, teaching experience)

1.6 Literature Review

The literature indicates that the shift towards e-learning has led to a redefinition of the roles of faculty members, as their role is no longer limited to teaching and research, but has extended to include additional tasks such as managing digital platforms, designing electronic content, and providing technical support to students.

This expansion of roles has led to a significant increase in workload, as well as a negative impact on job satisfaction.Berge, 2008; Kirkwood & Price, 2014; Watermeyer et al., 2021).

The literature also confirms that organizational factors, particularly the degree of centralization in the administrative structure, play a crucial role in determining the effectiveness of digital transformation. Centralized structures tend to slow down decision-making processes, increase administrative complexity, and weaken institutional coordination, thus limiting organizations' ability to adapt to the demands of the digital environment.Hinings et al., 2018; Vial, 2021).

In this context, studies indicate that heavy reliance on technology without adequate institutional support exacerbates occupational stress and increases levels of technological stress.Furthermore, studies show that a lack of digital resources and weak infrastructure are major factors that increase the complexity of academic work, especially when technological demands exceed users' capabilities (Molino et al., 2020; Peinado-Abellera et al., 2021). Technological stress is defined as a state of psychological strain resulting from difficulty adapting to digital systems and their increasing demands (Tarafdar et al., 2015).

On the other hand, the literature emphasizes the crucial role of training and technical support in enhancing the efficiency of technology use and reducing associated stress. Providing ongoing training programs and effective technical support contributes to improving the user experience and increasing technology acceptance, which positively impacts academic performance. Bond et al., 2018; Almaiah et al 2020).

1.7 Theoretical Framework

This study adopts an integrative theoretical perspective that links technology management and organizational performance, viewing digital transformation as a multidimensional process arising from the interaction between technology, organizational structures, and human behavior within the organization. The literature indicates that the effectiveness of digital transformation does not depend on the technology itself, but rather on its integration with the organizational context and capabilities.(Vial, 2021; Hinings et al., 2018). It also builds upon the TAM and UTAUT models by extending them to include regulatory and stress-related variables.

The theoretical framework is based on the assumption that faculty experience in a digital environment is not determined solely by technical factors, but is also influenced by organizational factors, such as the nature of the administrative structure, the level of institutional support, and the organizational culture. This approach aligns with technology adoption models, such as the technology acceptance model.TAM) and the Unified Theory of Technology Acceptance and Use (UTAUT) model, which asserts that the actual use of technology is influenced by cognitive and contextual factors, and not just by the characteristics of the technological system (Davis, 1989; Venkatesh et al., 2003).

Therefore, this research adopts an integrative approach.(Holistic Approach) To understand digital transformation, it takes into account the interaction between technological, organizational and human dimensions, as interrelated elements that collectively affect the outputs of academic work.

Nevertheless, the scope of this study remains limited to internal organizational factors, while acknowledging that external factors, such as national policies, funding, and macro-level infrastructure, may play a significant role in shaping the digital transformation experience. Therefore, exploring these factors represents an important direction for future research.

2. Methodology

2.1 Research Design

This study is based on a mixed methodology. **Mixed Methods Approach** This approach combines qualitative and quantitative methods to provide a comprehensive and multidimensional understanding of the impact of digital transformation on academic work. It is well-suited for studying complex phenomena where technical, organizational, and human dimensions intersect, allowing for the integration of the explanatory depth of qualitative data with the generalizing power of quantitative analysis. Creswell & Plano Clark, 2018).

In this context, structural equation modeling was employed.**(Structural Equation Modeling - SEM)**To test the causal relationships between the study variables, a technique widely used in information systems research and

higher education for its ability to analyze complex relationships between underlying variables (Hair et al., 2019).

2.2 Study Methodology

The study adopted a sequential exploratory design.(Sequential Exploratory Design), where it began with a qualitative phase to extract patterns and build the conceptual model, followed by a quantitative phase to test this model statistically.

This design is considered one of the most suitable for studies that lack clear theoretical models, as it allows for the development of measurement tools based on field reality. Creswell & Plano Clark, 2017).

This approach also contributes to achieving what is known as systematic triangulation (Methodological Triangulation), by integrating multiple data sources, enhances the credibility and reliability of the results (Fetters et al., 2013; Bryman, 2016).

2.3mThe study and the sample

In the qualitative stage, the purposive sampling method was adopted.(Purposive Sampling), where six faculty members were selected to maximize diversity in demographic and professional characteristics, such as experience, academic rank, and gender. This approach aligns with the nature of qualitative research, which focuses on deepening contextual understanding of the phenomenon under study rather than seeking statistical generalization (Patton, 2015).

In the quantitative phase, a questionnaire was developed based on the results of the qualitative phase and previous literature, and was applied to a sample consisting of ((N = 80). This size is acceptable in studies that rely on structural equation modeling (SEM), especially in exploratory models, where stable estimates can be achieved when using models of moderate complexity (Hair et al., 2019; Kline, 2023).

2.4 Data collection tools

First: Qualitative data

Qualitative data were collected through semi-structured interviews.(Semi-structured Interviews), which allow for a balance between standardizing questions and allowing some flexibility in exploration, thus enhancing the depth of understanding (Kvale, 2007). The interviews focused on a number of key themes, including: academic workload, technical challenges, training and institutional support, and the experience of e-teaching.

The interviews were recorded after obtaining the participants' consent, then transcribed in preparation for analysis, in accordance with the methodological procedures adopted in objective analysis.(Braun & Clarke, 2006).

Second: Quantitative data

The questionnaire was designed based on previous literature, the proposed conceptual model, and the results of the qualitative phase, ensuring the instrument's consistency with the study context.

The five-point Likert scale was used (The Likert Scale is used to measure participants’ responses, due to its widespread use and suitability in behavioral and organizational studies, as it allows for the measurement of attitudes and opinions with a high degree of reliability (Likert, 1932).

2.5 Data Analysis

Qualitative analysis

Qualitative data were analyzed using thematic analysis (Thematic Analysis) according to the methodology of Braun and Clarke (2006), by following a set of sequential methodological steps that include: initial coding of the data, identification of recurring patterns, and then grouping them into axes that reflect the main dimensions of the phenomenon under study.

The axes were also reviewed and their internal consistency verified to ensure they accurately represented participants' experiences. This approach is suitable for uncovering implicit meanings and underlying patterns in qualitative data, thus enhancing the interpretive understanding of the results.(Braun & Clarke, 2006).

Quantitative analysis

Quantitative data were analyzed using structural equation modeling (Structural Equation Modeling (SEM), with the aim of testing the causal relationships between the study variables.

The model was evaluated using a number of approved statistical indicators, including: path coefficients (Path Coefficients) to determine the strength and direction of relationships, levels of statistical significance (p-values), as well as Model Fit Indices, such as: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error (RMSEA), and Root Mean Standard Residual Squares (SRMR).

These indicators are among the fundamental criteria used in evaluating the quality of structural models, as their acceptable values indicate the extent to which the model matches the empirical data.Hu & Bentler, 1999; Hair et al., 2019).

2.6 Honesty and consistency

The quality of the measurement instrument was assessed through a set of reliability and validity indicators adopted in structural equation modeling studies.(SEM). Cronbach's Alpha coefficient was used to measure internal consistency, with a reference value of no less than (0.70) adopted as an indicator of acceptable reliability.

The composite stability coefficient was also calculated.(Composite Reliability - CR) to confirm the reliability of the underlying structures, in addition to the Average Variance Extracted (AVE) to assess convergent validity.

To verify discriminatory validity, a standard was adopted. Ornell–Larcker, which compares the square root of AVE values with the correlation coefficients between variables (Fornell & Larcker, 1981; Hair et al., 2019).

The instrument's reliability was also enhanced. Through systematic triangulation, reliance on previous literature in constructing paragraphs, in addition to reviewing the tool by specialists before field application.

2.7 Ethical considerations

The ethical standards adopted in scientific research were adhered to, with informed consent obtained from all participants before data collection. Confidentiality and anonymity of participants were guaranteed, and data was used solely for scientific research purposes.

In addition, participants were given the full right to withdraw from the study at any stage without any consequences, in line with ethical principles in social research.Bryman, 2016).

3.8 Methodological Considerations

Given that the study relied on a qualitative approach in its first stage, the principle of researcher reflectivity was adopted.(Reflexivity) should be taken into consideration, as the researcher is a key instrument in collecting and analyzing data, and his background and perceptions may affect the interpretation of the results (Lincoln & Guba, 1985).

To minimize systematic bias, several measures were implemented, including the use of neutral questions, rephrasing questions as needed to ensure clarity, and separating data presentation from interpretation during the analysis. Transparency in presenting the results was also maintained to ensure the credibility of the qualitative analysis.

3. Results

3.1NOverview

The results of this study are based on an integrated analysis combining qualitative data obtained from semi-structured interviews and quantitative data from a sample consisting of**(N = 80)**From the faculty members, using a five-point Likert scale.

This integration aims to provide a comprehensive understanding of the impact of digital transformation on the dimensions of academic work, while verifying structural relationships using structural equation modeling (SEM).

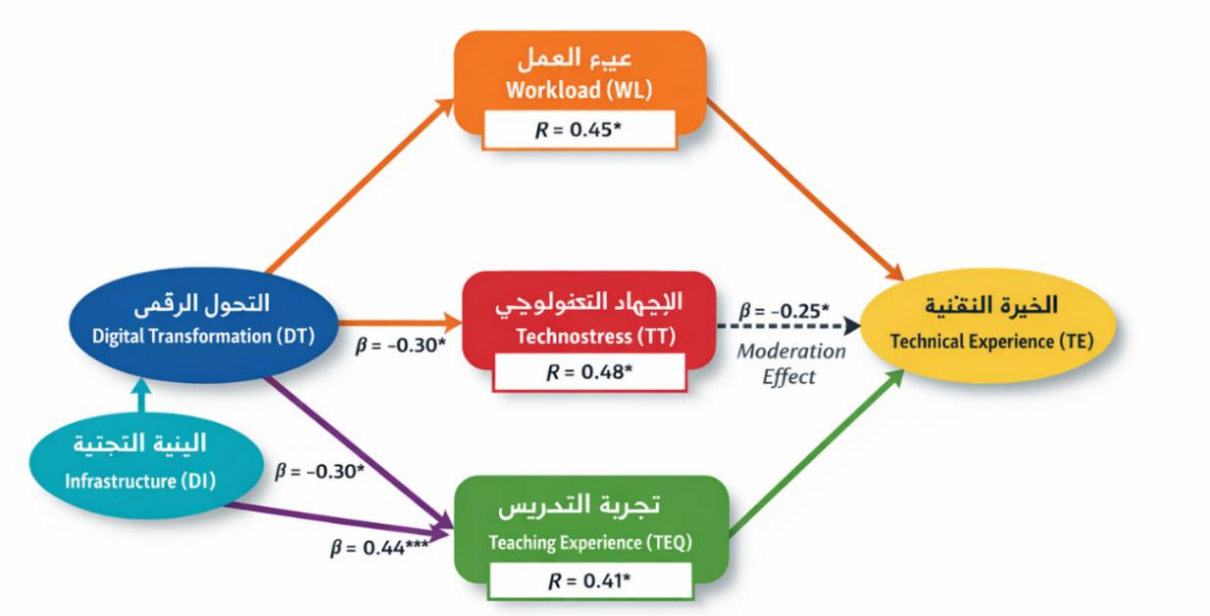

Figure 1: Structural Equation Model (SEM) of the impact of digital transformation on academic work outputs.

3.2 Qualitative Results

5.2.1 Participant Characteristics

It is clear Table 1 Demographic characteristics of the qualitative study sample, which was intentionally selected to ensure diversity in experience and degree the scientific[5].

Table 1. Demographic characteristics of participants (gender group)

participant	Academic degree	Sex	Experience (in years)	Experience in information and communication technology
P1	Senior Lecturer	Female	12	High
P2	Senior Lecturer	Female	10	Medium
P3	lecturer	Male	8	Medium
P4	lecturer	Female	6	Low
P5	lecturer	Female	5	Medium
P6	Teaching assistant	Male	3	Low

The data indicates Table 1 shows a clear disparity in the level of professional and technical expertise among the participants, which allowed for a deeper analysis of the different experiences of faculty members in dealing with digital transformation.

5.2.2 Themes Analysis

The thematic analysis yielded seven main themes, as outlined in Table 2.

Table 2. Summary of themes emerging from thematic analysis

the topic	Supporting evidence	Description
Increased workload	Increased workload due to digital tasks	Platform management, data entry
Organizational structure	The impact of centralization on work	Poor coordination, duplication of tasks
Experience in information and communication technology	The role of technical expertise	Different levels of adaptation among professors
Training and Support	Lack of training and support	Reliance on self-learning
Teaching experience	Difference in teaching quality	Improvement for some, difficulty for others
Technological stress	Psychological stress due to technology	Fatigue, multiple systems
isolation	Feeling isolated	Weak social interaction

The results indicate Table 2 indicates that digital transformation has led to a significant increase in workload, as many administrative and technical tasks have been transferred to faculty members. Organizational centralization has also emerged as a factor that further complicates work due to weak institutional coordination.

On the other hand, the results showed that a lack of training and technical support represents a major challenge, with many participants relying on self-learning, which increases professional stress. A clear prevalence of technology-related stress was also recorded. Technostress), especially among individuals with limited technical experience.

These axes demonstrate a direct link to the conceptual model, as they were used as a basis for building relationships that were later tested in quantitative analysis.

3.3 Quantitative Results

3.3.1 Measurement Model

Validity and reliability were assessed as described in Table 3.

Table 3. Reliability and soundness of structures

variable	Cronbach's Alpha	CR	AVE
Digital transformation(DT)	0.85	0.88	0.70
workload(WL)	0.83	0.87	0.69
Technological stress(TT)	0.88	0.90	0.73
Training and Support(TS)	0.84	0.87	0.68

Infrastructure(DI)	0.82	0.86	0.67
Organizational structure(OS)	0.80	0.85	0.65
Technical expertise(TE)	0.87	0.89	0.72
teaching experience(TEQ)	0.85	0.88	0.70

The results indicate Table 3 shows that all values exceeded the acceptable limit (0.70), indicating a high level of reliability and construct validity, and therefore the validity of using these variables in the structural model.

5.3.2 Model Fit Quality

It is clear Table 4 Model Quality Indicators.

Table 4. Model suitability indicators

Index	Value	Interpretation
CFI	0.93	very good
TLI	0.91	good
RMSEA	0.058	acceptable
SRMR	0.048	good

The results indicate Table 4 indicates that the model has a good degree of conformity with the data, as all indicators fall within the acceptable limits in social science studies.

5.3.3 Path Analysis

The hypotheses were tested using the path coefficients as described in Table 5.

Table 5. Structural Model Path Coefficients

The path	The path	β	p-value	Result
DT ← WL	Digital transformation → Academic workload	0.55	< 0.001	Supported
DT ← TT	Digital transformation → Technological stress	0.52	< 0.001	Supported
DT ← TEQ	Digital transformation → The e-learning experience	0.32	< 0.05	Supported
DI ← TT	Digital infrastructure → Technological stress	-0.30	< 0.05	Supported
TS ← TEQ	Training and Technical Support → Online Teaching Experience	0.44	< 0.001	Supported
OS ← WL	Organizational structure → Academic workload	0.38	< 0.01	Supported
DT × TE ← TT	Digital transformation × technical expertise ← Technological stress	0.25	< 0.05	

The results indicate Table 5 shows that digital transformation has statistically significant effects on various dimensions of academic work. Digital transformation demonstrated a moderately strong positive effect on workload (β = 0.55) and technological stress (β = 0.52), reflecting increased professional pressures associated with the use of digital systems.
In contrast, digital transformation has shown a moderately positive impact on the e-learning experience.(β = 0.32), which indicates that there are positive aspects despite the challenges.
The results also showed that improving digital infrastructure contributes to reducing technological stress, while training and technical support play an important role in improving the teaching experience.

3.3.4 Effect of the moderating variable

The modulating effect of technical expertise was tested as described in Table 5 shows that:
(β = -0.25, p < 0.05)
This indicates that technical expertise contributes to reducing the negative impact of digital transformation on technological stress, which enhances the ability of faculty members to adapt to the digital environment.

3.3.5 Interpretation factor (R^2)

The model results indicate that:

- Digital transformation and its associated variables explain45% of the variance in workload
- and48% of the variance is in technological stress
- and41% of the online teaching experience

These are good interpretation ratios in the context of social studies.

3.4 Integration of qualitative and quantitative results

The comparison between qualitative results reveals(Table 2) and quantitative results (Table 5) show a high degree of consistency.

For example, qualitative data showed that workload increased as a result of digital transformation, which was quantitatively confirmed by the statistically significant positive effect.(DT → WL). The phenomenon of technological stress was also observed in the interviews, which was supported by quantitative analysis.

Furthermore, the results on both sides confirmed the importance of training and technical support in improving the teaching experience, thus enhancing the reliability of the results through systematic triangulation.

4. Discussion

This study aims to analyze the impact of digital transformation on the nature of faculty work by integrating qualitative and quantitative findings within a comprehensive explanatory framework. The results show that digital transformation is a multidimensional phenomenon that directly and indirectly affects various components of academic work, as evidenced by the results of structural equation modeling (SEM) shown in Table 5 and Figure (Figure 1).

4.1 Digital transformation and academic workload

The quantitative analysis results showed a statistically significant positive effect of digital transformation on academic workload.($\beta = 0.55$), as shown in Table 5, indicating that increased reliance on digital systems is associated with higher professional workloads for faculty members.

This result is consistent with what was revealed by the qualitative analysis.(Table 2), where increased workload emerged as one of the most prominent challenges associated with digital transformation. This reflects the transfer of many administrative and technical tasks to faculty members, such as managing educational platforms, preparing digital content, and data entry, which leads to an overlap between academic and technical roles.

These results are consistent with previous literature, where it was noted that Berge (2008) argued that e-learning environments necessitate an expansion of faculty roles to include additional technical and administrative tasks. Kirkwood and Price (2014) also asserted that integrating technology into the educational process does not necessarily reduce effort; rather, it may increase the complexity of educational practices and their operational requirements.

4.2 Digital Transformation and Technological Stress

The study results indicate a strong positive relationship between digital transformation and technological stress.($\beta = 0.52$), as shown in Table 5, which reflects the psychological stress resulting from intensive use of technology.

This result was supported by qualitative analysis.(Table 2), where the focus of technological stress emerged as one of the recurring patterns in the participants' experiences, especially in light of the multiplicity of digital systems and the weakness of training.

These results are consistent with what he presentedMonideepa Tarafdar et al. (2015) identified technological stress as one of the major negative effects of digital transformation. This is also consistent with the findings of Kang Wang et al. (2008), who indicated that environments heavily reliant on information technology are more prone to high levels of technological stress.

4.3 Digital Transformation and the E-Learning Experience

Despite the challenges associated with digital transformation, the results showed a moderate positive impact on the e-learning experience.($\beta = 0.32$), as shown in Table 5, indicating that digital transformation not only generates pressures, but also provides tangible opportunities to improve the quality of the educational process.

The qualitative results support(Table 2) This trend showed a disparity in the experiences of faculty members; some participants indicated that the digital environment contributes to enhancing interaction and expanding teaching tools, while others expressed difficulties in adapting to technical requirements, reflecting the lack of homogeneity of digital experiences among individuals.

These results are consistent with previous literature, where it is seen that Selwyn (2016) stated that educational technology has great potential to improve learning, but its effectiveness remains conditional on how it is employed within the institutional context, and the extent to which the necessary organizational and technical support is available.

These results indicate that maximizing the benefits of digital transformation requires creating a supportive institutional environment that reduces the digital skills gap among faculty members and promotes the effective use of technology in the educational process.

4.4 The Role of Digital Infrastructure

The results showed that digital infrastructure negatively impacts levels of technological stress.(β = -0.30), as shown in Table 5, indicating that improving the quality and integration of digital systems contributes to reducing the technical pressures faced by faculty members.

The qualitative results support(Table 2) This is the explanation, as participants pointed out that the weakness of digital systems and the multiplicity of non-integrated platforms lead to increased complexity of work, and a drain on time and effort, which enhances the feeling of technological stress.

These findings are consistent with previous literature, which confirms that the quality of digital infrastructure and the integration of systems are crucial factors in the success of digital transformation and in minimizing its negative impacts on users.(Cox & Pinfield, 2014; Tarafdar et al., 2015).

These results indicate that technological stress is not only related to the intensity of technology use, but is greatly affected by the efficiency of the surrounding digital environment, highlighting the importance of investing in an integrated and user-friendly infrastructure to enhance the user experience and reduce professional stress.

4.5 Training and Technical Support Role

The study results indicate that training and technical support have a significant positive impact on the teaching experience.(β = 0.44), as shown in Table 5. This is consistent with the qualitative findings (Table 2), which demonstrated a clear lack of training opportunities and a high reliance on self-learning by faculty members. This finding is supported by recent literature, which emphasizes that both

Bond et al. (2018) and Almaiah et al. (2020) found that providing ongoing training programs and effective technical support directly contributes to improving the efficiency of using digital systems, enhancing technology acceptance, and reducing associated stress. These studies also indicate that the lack of institutional support is one of the most significant obstacles to the success of digital transformation in higher education.

4.6 Organizational structure and workload

The results showed a positive effect of organizational structure on workload ((β = 0.38), as shown in Table 5, indicating that certain organizational patterns, particularly centralized structures, may contribute to increased operational burdens on faculty members. This aligns with the qualitative findings (Table 2), which highlighted weak institutional coordination and duplication of tasks. This result supports the arguments put forth by Hinings et al. (2018) and Vial (2021) emphasized that organizational structure plays a pivotal role in the success or failure of digital transformation, and that centralized structures may hinder organizational flexibility and lead to increased administrative complexity, which negatively impacts performance efficiency.

4.7 The Modifying Role of Technical Expertise

The model results showed(Figure 1) There is a moderating effect of technical experience (β = -0.25), which contributes to reducing the relationship between digital transformation and technological stress.

This result is consistent with what was reported in the qualitative analysis.(Table 2), where it was shown that faculty members with higher technical expertise were more able to adapt to the digital environment.

This finding is also supported by recent studies such as Scherer et al. (2020) and Instefjord & Munthe (2017) confirmed that digital competence is a crucial factor in reducing technical stress and promoting the effective use of technology in the educational process, thereby limiting levels of technological stress.

4.8 Integration of results

The comparison between qualitative results shows(Table 2) and the quantitative results (Table 5) showed a high degree of consistency, as the quantitative analysis results supported the patterns extracted from the interviews. For example:

- Increased workload(Qualitative)⇐Supported quantitatively (β = 0.55)
- Technological stress⇐ Supported quantitatively(β = 0.52)
- Training role⇐ Supported quantitatively(β = 0.44)

This consistency enhances the credibility of the results and supports the use of the mixed method as an effective analytical framework for studying complex phenomena such as digital transformation, as it allows for the integration of interpretive depth with statistical power. Creswell & Plano Clark, 2017).

Analytical Summary(Revised Analytical Conclusion)

The results of this study indicate that digital transformation in higher education cannot be reduced to a purely technical process, but rather represents a multi-dimensional institutional transformation in which various aspects intersect.:

- Technological dimension
- Organizational dimension
- human dimension

The results also confirm that the success of this transformation depends on a set of integrated factors, including:

- Digital infrastructure quality
- Effectiveness of training and technical support
- organizational structure flexibility
- Level of technical expertise among faculty members

Therefore, managing digital transformation requires adopting an integrated approach (The Holistic Approach takes into account the interaction between these dimensions, rather than focusing solely on the technical aspect, which is consistent with recent literature in this field (Vial, 2021; Hinings et al., 2018).

5. Conclusion

This study provides a comprehensive analysis of the impact of digital transformation on the nature of academic work for faculty members, through the use of a mixed methodology that combines qualitative analysis and quantitative testing using structural equation modeling.(SEM). The results showed that digital transformation is not just an adoption of technological tools, but a structural institutional transformation that reshapes academic roles, organizational processes, and patterns of interaction within higher education institutions, which is consistent with the theoretical approach to digital transformation as a multi-dimensional concept (Vial, 2021).

As the results showed, as illustrated in Table 5 and Figure 1 show that digital transformation is associated with a significant increase in workload and technological stress, reflecting the growing professional challenges faced by faculty members in digital environments. Conversely, the study revealed a moderate positive impact of digital transformation on the e-teaching experience, suggesting that this transformation holds real opportunities to improve the quality of the educational process, despite the accompanying pressures. This finding is supported by recent literature in the field of digital education (Neil Selwyn, 2021). At the level of mediating factors, the results confirmed the crucial role of digital infrastructure, training and technical support, and organizational structure in determining the direction and strength of the impact of digital transformation. Improving these factors was shown to mitigate negative effects and enhance potential benefits. The study also highlighted the moderating role of technical expertise, which contributes to reducing levels of technological stress and enhancing adaptability, consistent with studies on digital competence in education (Ralf Scherer et al., 2020). Accordingly, it can be concluded that the success of digital transformation in higher education requires the adoption of a holistic approach that takes into account the dynamic interaction between technological, organizational and human dimensions, rather than focusing solely on the technical dimension, which represents a modern trend in the literature on institutional transformation (Hinings et al., 2018).

6. Scope of the study

Despite the scientific value of the results, this study is subject to a number of methodological limitations that should be taken into account when interpreting the results.:

Firstly, the study relied on quantitative data from a limited sample.(N = 80), which may limit the possibility of statistical generalization of the results, although this size is considered acceptable in exploratory studies that use structural equation modeling.

Secondly, the qualitative data was limited to a small sample (6 participants), which is consistent with the nature of qualitative research based on interpretive depth, but it may not reflect all viewpoints within the academic community.

Third, the study focused on a specific institutional context (Bani Walid University), which may limit the possibility of generalizing the results to other educational institutions that differ in their infrastructure or organizational patterns.

Fourth, the study relied on a cross-sectional design.(Cross-sectional), which does not allow for the analysis of time changes or tracking the long-term evolution of the impact of digital transformation.

Fifth, the study did not address some important external factors, such as national policies, institutional funding, and macro-level digital infrastructure, which may have a direct impact on the success of digital transformation.

7. Future research prospects

In light of the previous findings and limitations, this study opens up a number of important future research avenues.:

Firstly, it is recommended that future studies be conducted using larger samples and multi-context field data, which enhances the generalizability of the results, while employing advanced models in structural equation modeling.

Secondly, the study can be expanded to include comparisons between different universities at both the local and international levels, with the aim of analyzing the impact of the institutional context on shaping the outcomes of digital transformation.

Third, it is suggested to adopt longitudinal designs(Longitudinal Designs) to study the evolving impact of digital transformation on academic work over time, especially in light of the continuous acceleration in educational technologies.
Fourth, additional variables can be included in the model, such as:

- Job satisfaction
- Job burnout(Burnout)
- Academic performance

This is to broaden the theoretical understanding of the far-reaching effects of digital transformation.
Fifth, it is recommended to study the role of emerging technologies, especially artificial intelligence, in reshaping academic work, in light of the increasing trend towards smart education.
Sixth, integrative explanatory models can be developed that combine organizational theories and technology adoption models such as Technology. Acceptance Model and Unified Theory of Acceptance and Use of Technology
To provide a more comprehensive theoretical framework and explanation of user behavior in digital environments.

References

[1] Almaiah, M.A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during the COVID-19 pandemic. Education and information technologies, 25(6), 5261-5280.

[2] Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological Antecedents and Implications1. MIS quarterly, 35(4), 831-A10.

[3] Berge, Z. L. (2008). Changing instructor's roles in virtual worlds. Quarterly Review of Distance Education, 9(4), 407-414.

[4] Bond, M., Marín, VI, Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: student and teacher perceptions and use of digital media. International journal of educational technology in higher education, 15(1), 48.

[5] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative research in psychology, 3(2), 77-101.

[6] Bryman, A. (2016). Social research methods. Oxford university press.

[7] Cox, A. M., & Pinfield, S. (2014). Research data management and libraries: Current activities and future priorities. Journal of library and information science, 46(4), 299-316.

[8] Creswell, J. W., & Clark, V. L. P. (2017). Designing and conducting mixed methods research. Sage publications.

[9] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS quarterly, 13(3), 319-340.

[10] Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—principles and practices. Health services research, 48(6pt2), 2134-2156.

[11] Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 18(1), 39-50.

[12] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis.

[13] Hinings, B., Gegenhuber, T., & Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. Information and organization, 28(1), 52-61.

[14] Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. Educause review, 27(1), 1-9.

[15] Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural equation modeling: a multidisciplinary journal, 6(1), 1-55.

[16] Instefjord, E. J., & Munthe, E. (2017). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. Teaching and teacher education, 67, 37-45.

[17] Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. Learning, media and technology, 39(1), 6-36.

[18] Kline, R. B. (2023). Principles and practice of structural equation modeling. Guilford publications.

[19] Kvale, S. (2007). Doing Interviews, Sage Publications. Translated into Polish by Agata Dziuban. Prowadzenie wywiadów. Warszawa: Wydawnictwo Naukowe PWN.

[20] Likert, R. (1932). A technique for the measurement of attitudes. Archives of psychology.

[21] Lincoln, YS and Guba, EG (1985) Naturalistic Inquiry. SAGE

[22] Molino, M., Ingusci, E., Signore, F., Manuti, A., Giancaspro, M. L., Russo, V., ... & Cortese, C. G. (2020). Wellbeing costs of technology use during Covid-19 remote working: An investigation using the Italian translation of the technostress creators scale. Sustainability, 12(15), 5911.

[23] Patton, M. Q. (2015). Qualitative research & evaluation methods: integrating theory and practice. (No Title).

[24] Meelad, R. A., Mousa, M. A., & ulwahad AlSharaa, M. A. (2026). Convolutional Neural Network Models For Automated Art Style Identification: Design Training, And Evaluation. Bani Waleed University Journal of Humanities and Applied Sciences, 178-188.

[25] Scherer, R., Siddiq, F., & Tondeur, J. (2020). All the same or different? Revisiting measures of teachers' technology acceptance. Computers & Education, 143, 103656.

[26] Selwyn, N. (2021). Education and technology: Key issues and debates. Bloomsbury Publishing.

[27] Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. S. (2015). Technostress: negative effect on performance and possible mitigations. Information systems journal, 25(2), 103-132.

[28] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view1. MIS Quarterly, 27(3), 425-478.

[29] Shouran, Z., Mousa, M. A., Alatresh, S. A., & ulwahad AlSharaa, M. A. (2025). Security and Privacy in the Internet of Things: Issues, Challenges, and a Deep Learning-Based Intrusion Detection Framework. Bani Waleed University Journal of Humanities and Applied Sciences, 10(4), 225-233.

[30] Verina, N., & Titko, J. (2019). Digital transformation: conceptual framework.

[31] Vial, G. (2021). Understanding digital transformation: A review and a research agenda. Managing digital transformation, 13-66.

[32] Zaied Shouran , Husam A.S.Khalifa, Mohammed Abdo ulwahad AlSharaa,Mohyaadean Atiya Mousa, Salem Asseed Alatresh (2025). AI-Enhanced Semantic IoT Framework for Smart City Management Information Systems. (2025). Libyan Open University Journal of Applied Sciences (LOUJAS), 1(2), 01-07. https://doi.org/10.65422/loujas.v1i2.73

[33] Said, K. K., Rhaimi, C. B., & Alatresh, S. A. (2024). CLASSIFICATION OF SKIN CANCER BASED ON DEEP LEARNING USING CONVOLUTIONAL NEURAL NETWORKS–OPPORTUNITIES AND VULNERABILITIES A SYSTEMATIC REVIEW. Malaysian Journal of Industrial Technology, 8(3), 1-12.

[34] Watermeyer, R., Crick, T., Knight, C., & Goodall, J. (2021). COVID-19 and digital disruption in UK universities: Affections and affordances of emergency online migration. Higher education, 81(3), 623-641.

[35] SAID, K. K., RHAIMI, C. B., & Alatresh, S. A. (2024). Skin Diseases Discover based On Artificial Intelligence. Bani Waleed University Journal of Humanities and Applied Sciences, 188-198.

[36] SAID, K. K., RHAIMI, C. B., & Alatresh, S. A. (2024). A Review on Melanoma Skin Cancer Detection Using Deep Learning. African Journal of Advanced Pure and Applied Sciences, 154-159.