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The effect of digital transformation on teacher performance evaluation in Palestinian schools

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Digital transformation is defined as a change related to the adoption of digital technology that brings about a radical shift in work methods, aiming to serve beneficiaries more efficiently and quickly. The study aimed to assess the impact of digital transformation within the Ministry of Education, as perceived by Palestinian public school principals. An analytical descriptive curriculum was adopted, and data were collected using a 36-item questionnaire distributed across three dimensions. The study included all principals of public schools in two cities in Palestine. The results indicated that school principals observed a remarkable level of digital transformation within the Ministry of Education. Moreover, a significant correlation was found between digital transformation planning, preparing leaders for digital transformation, and evaluating employee performance. However, no statistically significant relationship was discovered between organizational readiness for digital transformation and employee performance assessment. Researchers recommend that educational institutions develop comprehensive digital transformation programs and provide ongoing training opportunities for teachers.

KEYWORDS

digital transformation (DT), evaluation of performance, principles perspectives, education, technology in education

1 Introduction

Technological advancements have had a profound impact on daily life, leading to global changes and fundamental transformations across various fields. These technologies include Web 2.0, the Internet, mobile technologies, cloud computing, digital media, big data, artificial intelligence, augmented reality, the Internet of Things, 3D printing, and more. Technology has significantly influenced society, marking the beginning of a new process (Bilgem, 2019). The resulting digital transformations (DTs) from these innovations continue to evolve steadily.

The integration of technology into education has become an essential requirement for adapting to the changing needs of generations and enhancing the learning environment. From this perspective, digital transformation is regarded as a necessity rather than a luxury. Moreover, technology should be implemented in areas that contribute to societal advancement, such as education, healthcare, public administration, and industry. The Digital Competitiveness Report by the International Institute for Management Development (2017) highlights the new roles and responsibilities assigned to individuals in educational institutions, particularly school administrators, as a result of these developments. It

emphasizes the need to cultivate leadership skills, broaden knowledge, and adopt teacher evaluation methods to assist educators in adapting to global shifts in the educational system (Al-Hariri, 2018, p. 65).

Jalal et al. (2018) argued that applying digital technology alongside new developmental pathways provides users with a unique experience at a lower cost, thereby increasing satisfaction. They evaluated organizational readiness in terms of components and equipment to benefit from the experiences of DTs in institutional work methods. Researchers explored qualitative assessments to determine the willingness to adopt digital technology, as well as identify the strengths and weaknesses of organizational assets and resources. They stressed the importance of developing tools and equipment to enable the efficient use of modern technology. Additionally, they called for innovative methods to ensure the rapid and effective provision of services. Numerous studies, including Al-Aqtash (2019), recommend adopting digital management systems to address the challenges of the digital era, which represent the latest trends in meeting the demands of the digital age.

Additionally, Al-Oshmaoui and Al-Osaimi (2021) underscored the importance of improving digital awareness among school leaders and establishing mechanisms for the regular updating of operating systems. This highlights the significance of information security and the protection of school data. Despite these recommendations, a deeper understanding of how DT influences the teacher performance evaluation process remains necessary.

Hanelt et al. (2020) pointed out that accelerating the implementation of DT-related strategies requires managers to develop intellectual skills. This indicates the ability to conceptualize new digital processes and products based on available internal and external resources, as well as to invest managerially in financial resources during times of sudden change.

Recent developments demonstrate significant progress in DT within the Palestinian education system. For example, in response to the COVID-19 pandemic, national authorities connected over 70 schools in the West Bank to the Internet, improving access to online learning for marginalized communities by 2022 (United Nations in Palestine, 2023). Despite these efforts, challenges persist, as noted by UNDP reports, which stress the need for robust digital infrastructure and targeted strategies to accelerate the adoption of digital tools in the education sector (UNDP, 2021). Globally, platforms such as TeachBoost have shown the effectiveness of digital tools in enhancing teacher performance evaluations, which underscores their relevance to Palestine (TeachBoost, 2024a,b).

From a research perspective, numerous studies have explored DT (Abu Hashish and Al-Halimi, 2023). However, a notable gap exists in the literature regarding the effect of DT on teachers' performance assessment in Palestinian schools from the perspective of principals. Only one study was found to address this topic, which focused exclusively on government schools in a specific region of the Gaza Strip. Consequently, its findings cannot be generalized beyond this context. This highlights the limited scope of research examining the impact of DT on teacher evaluation processes in Palestine.

Studies by Aburub and Assaf (2022) and Abu Mukh and Salhab (2021) focused on identifying the obstacles to digital education in Palestinian higher education institutions. Their findings revealed weaknesses in infrastructure and the absence of a strategic plan for implementing DT in education. However, these studies did not examine the impact of DT on teacher performance in Palestinian schools.

Given this clear research gap, this study seeks to investigate the impact of DT on teachers' performance assessments in Palestinian schools, with a specific focus on public schools in the West Bank. It aims to explore how DT affects teacher evaluation processes and how these technologies can improve these assessments. The study's findings are expected to benefit various stakeholders in the education sector, including school principals directly involved in teacher evaluation and teachers undergoing these assessments. By understanding how DT contributes to the development of evaluation processes, the effectiveness and quality of education can be improved, leading to enhanced teacher performance, skill development, motivation, and enriched learning experiences for students.

The rapid development of DT has significantly influenced the education sector globally, affecting both teaching methods and administrative processes. However, there remains a lack of understanding regarding the impact of DT on teacher performance evaluations in Palestinian governmental schools. This study aims to assess the extent to which DT will affect the evaluation of teachers' performance from the perspective of school administrators. Additionally, it seeks to identify the challenges and opportunities that may arise from this transformation, providing valuable insights into a poorly researched area.

1.1 Questions about the study

The main question: What is the impact of the DT teachers' performance assessment process in Palestinian government schools from the perspective of principals?

The sub-questions are as follows:

1. What extent of DT is observed within the Ministry of Education as per Palestinian government school principals?
2. What process is employed by principals to evaluate the job performance of Palestinian government school teachers?
3. What impact does DT have on the job performance appraisal process of Palestinian government school teachers from the perspective of their principals?

1.2 Objectives of the study

1. Understanding School Principals' Perspectives on DT Implementation in Palestinian Government Schools Affiliated with the Ministry of Education.
2. Examining School Principals' Perceptions Regarding the Evaluation of Teachers' Job Performance in Palestinian Government Schools.
3. Investigating School Principals' Opinions on the Impact of DT on the Evaluation of Teachers' Job Performance in Palestinian Government Schools.

1.3 Importance of the study

1. Implementation of DT: This study examines the effect of DT on the process of evaluating teachers 'performance, focusing on the benefits and challenges associated with the introduction of these technologies in Palestinian schools.

2 Studying the opinions of school principals on this issue provides insight into how they perceive the impact of DT assessment and performance improvement in educational institutions.
3 DT helps develop various aspects of evaluating teachers' performance, thereby enhancing the outcomes of the educational process.

2 Literature review

2.1 The concept of digital transformation

Gopal (2020) affirmed that emerging technologies would continue to advance work methods, necessitating a reengineering of organizational systems and processes through advanced systems. This approach aims to add value for users and enhance the application of digital technology. Alghamdi (2022) defines DT as a shift driven by the adoption of digital technology to radically change work methods, aiming to serve beneficiaries more efficiently and effectively. Similarly, Ismail (2010, p. 78) defines DT as integrating information and communication technology in governmental and private institutions. This approach primarily aims to improve organizational performance and service quality while increasing operational efficiency, effectiveness, and business professionals and reforming internal institutional relationships to streamline workflow across all departments. Additionally, Ahmed (2009) describes DT, or digitization, as the process of acquiring electronic text collections and managing them by converting information stored on traditional media into electronic formats. This ensures that the original content becomes easily accessible across various digital platforms.

2.2 Digital transformation requirements

Meeting the requirements for DT necessitates taking several fundamental actions, highlighted by previous research. Amin (2018) emphasized the importance of training school teachers to effectively adapt to regime changes. His research underscores the necessity of a well-developed technological infrastructure to facilitate the effective management of DT. Such infrastructure should confirm accessibility and ease of use while enhancing the ability to exchange information efficiently, as Ibrahim (2020) highlighted. Furthermore, Amin (2018) also noted that meeting DT requirements involves equipping classrooms and study rooms with computers and reliable internet access. In addition, the provision of essential tools is critical, as emphasized by Al-Atarabi (2022).

Overall, it is evident that compliance with requirements plays a pivotal role in creating an educational environment conducive to implementing the reform process. By addressing these foundational needs, institutions can foster a seamless and effective integration of DT into the educational system.

2.3 Examples of digital tools and platforms in education

2.3.1 Learning Management Systems (LMS)

Learning Management Systems platforms, such as those at the University of Oxford, enhance student engagement and assessment by allowing educators to customize content and track progress (Centre for Teaching and Learning, University of Oxford, 2025).

2.3.2 Artificial intelligence (AI) in education

Schools in England use AI-generated content to support creative writing and historical learning. While AI enhances engagement, challenges include accuracy and over-reliance (The Guardian, 2025).

2.3.3 Digital learning games

Decimal point, an educational game for teaching decimals, improved student performance compared to traditional methods. However, game development requires significant resources (McLaren and Forlizzi, 2025).

2.3.4 Distance learning platforms

Platforms adopted during COVID-19 enabled remote learning but faced issues such as internet access and student engagement (National University, 2024).

3 Digital assessment tools

Online quizzes and e-portfolios provide efficient assessment methods but raise concerns over data privacy and training (ERIC, 2024).

3.1 Previous studies

The study conducted by Asbendri et al. (2024) aimed to examine the impact of implementing learning media with the assistance of Tinkercad on the educational outcomes of seventh-grade electronics engineering students. The research employed a semi-experimental approach using a non-equivalent control group design. Participants were divided into two groups: one group utilized Tinkercad as a learning tool, while the other relied on traditional teaching methods. The results revealed that the experimental group improved its performance by 11.5%. The study confirmed that the use of Tinkercad as a learning medium significantly enhances students' educational outcomes and increases their understanding, whether the material is theoretical or practical.

According to research conducted by Srisawat and their team at Thailand's Basic Education Commission in 2024, schools must establish proper digital systems to achieve better performance. They collected responses from 520 staff members across 22 departments, identifying seven crucial areas for DT: business operations, data management, applications, technology systems, security, staff capabilities, and infrastructure. These areas were found to play a pivotal role in the transition to digital means. The findings demonstrated that staff training and technological familiarity and fluency resulted in optimal school performance following the digital switch. The study emphasized that merely providing computers and technological devices is insufficient; comprehensive digital systems and protocols must be established for maximum efficiency. Furthermore, the researchers recommended the development of detailed guidelines to simplify the transition process for schools, making it more feasible and manageable.

Building on this, Sararuch et al. (2023) conducted a study involving four colleges using the Agile Enterprise Architecture (AEA) framework to facilitate their shift towards digital education. Through thorough qualitative analysis, including interviews, document review, and direct observation, the researchers demonstrated that AEA offers the necessary flexibility for transitioning to a more digital system—an inherently complex task. The study identified four key success factors: strong leadership, clear communication, skilled staff, and a commitment to continuous improvement. The results highlighted that AEA effectively catered to the needs of both students and instructors while achieving digitization goals. Moreover, the research paper provides practical guidance and consultation for universities embarking on their own digital transformation journeys. It also credits AEA as a strategic tool for managing such transitions successfully. This study lays the groundwork for future research on digitizing educational systems, particularly within higher education institutions.

The study by Abu Hashish and Al-Halimi (2023) examined the impact of DT on the job performance assessment process of public school teachers from the perspectives of principals. A total of 82 principals participated in this study, which utilized descriptive and analytical methods supported by SPSS analysis. The findings revealed that the Ministry of Education rated DT implementation as moderate (64.22%). However, the overall job performance program received high marks (70.44%) from the participants. The study also concluded no significant relationship exists between organizational readiness for DT and the job performance assessment processes. Furthermore, in preparing leaders, DT showed no observable positive impact on job performance evaluation.

A study conducted by Yildiz (2022) focused on analyzing the education system of North Cyprus, especially in the aftermath of the COVID-19 pandemic. The unexpected onset of the pandemic and the subsequent lockdowns left most students unable to access educational materials, compelling educational institutions to urgently adapt to digital means of teaching. The researchers investigated how instructors familiarized themselves with the DT and explored tools to measure digital fluency. While there is existing literature on digital fluency among instructors in Northern Cyprus, the rapidly evolving situation necessitated more up-to-date studies. The researchers emphasized the importance of strong partnerships between schools and the Ministry of Education to enhance the DT process and improve teacher training. They highlighted that DT is a multifaceted process requiring high-quality content, reliable software, skilled instructors, and ongoing support. DT should not be viewed as a short-term solution but as a long-term strategy to be implemented under the supervision of professionals.

The study by Akash and Qasim (2021) assessed the readiness of governmental institutions, focusing on the Ministry of Education in the Gaza Strip during the COVID-19 pandemic. Employing descriptive-analytical methodology and interview techniques, the study revealed that the technological environment within the ministry was moderately adequate but required significant improvements. Key findings included a lack of integration of electronic programs for data transmission and weaknesses in students' digital learning skills. Additionally, the study highlighted a lack of sufficient resources for technological preparation.

Benavides et al. (2020) investigated the impact of Industry 4.0 on higher education institutions (HEIs), prompting widespread DTs. The study examined the intersection of technology-driven education and DT, aiming to identify distinctive features of DT in HEIs. Analyzing 19 relevant papers published between 1980 and 2019 using the Kitchenham protocol, the study revealed that although progress has been made, existing proposals for DT in HEIs lack a comprehensive approach. This underscores the need for further research to help HEIs adapt to the demands of the fourth Industrial Revolution.

Lastly, the study by Balyer and Öz (2018) employed a phenomenological research design to explore educators' perspectives on DT in education. Semi-structured interviews were conducted with 20 faculty members from 9 universities. The results emphasized the importance of establishing a clear vision to create an effective learning environment in DT. The study also called for the provision of appropriate technological tools and ensuring that administrators are adequately prepared with the necessary skills to manage the digital transition.

3.1.1 Studies on digital transformation in educational performance evaluations

The Al-Anzi (2025) examined the impact of digital transformation at Northern Borders University, emphasizing the role of modern technical services, infrastructure, and continuous training in enhancing faculty performance. While most faculty members rated digital applications as highly efficient, some reported challenges such as insufficient training and weak institutional policies. The study recommended addressing these weaknesses to optimize digital transformation.

Similarly, the Al-Sawat and Al-Harbi (2022) explored digital transformation's effect on faculty performance at King Abdulaziz University. Using a descriptive-analytical method with a sample of 599 faculty members, the study confirmed that digital transformation enhances academic performance but identified obstacles limiting its effectiveness. It highlighted the need for proper standards, technical support, and strategic solutions to maximize benefits.

Building on this, the Aliwa (2021) investigated how digital learning transformation influences students' cognitive competence and engagement. The study surveyed 387 students and eight teachers and found that internet-based learning activities boosted students' confidence and problem-solving abilities. Teachers also observed improved student interaction with digital tools, fostering a more integrated learning environment.

4 Methodology

4.1 Study approach

Using the descriptive survey method, we employed a questionnaire as a tool and distributed it to the research sample to collect relevant data. Subsequently, the data was classified, analyzed, and discussed.

4.2 The tool of the study

The questionnaire established by Abu Hashish and Al-Halimi (2023) was employed to investigate the impact of DT on evaluating public school teachers' performance from the school principals' perspective. The questionnaire comprised (TeachBoost, 2024a,b)

items distributed across two dimensions. The first dimension consisted of DT items (Gopal, 2020), while the second dimension comprised job performance evaluation items (Amin, 2018).

The following table illustrates the sections of the questionnaire:

Each entry was assigned a weight using a 5-point scale (very high, high, moderate, low, very low). The survey was conducted using a questionnaire tool and distributed to the sample members, and weights were assigned to these values (Abu Hashish and Al-Halimi, 2023; Abu Mukh and Salhab, 2021; Aburub and Assaf, 2022; Ahmad and Murray, 2019; Ahmed, 2009) (see Table 1).

4.3 Study population

The study population consisted of all principals of public schools in Tubas and Jenin cities, totaling (1896) principals in 2024.

4.4 Study sample

Only the number of principals of government schools in Tubas and Jenin cities was considered to calculate the sample size. With a total population of 302, a confidence level of 90%, and an error rate of 5%, the sample size was determined to be 143.

Since Tubas has only 48 government school principals, all principals were included in the study, ensuring full representation of this population. This approach eliminated sampling errors and enhanced the validity of findings related to Tubas.

In contrast, Jenin has 122 principals, and due to resource and time constraints, a convenience sampling method was employed to select 95 principals who were readily accessible and willing to participate. This method allowed for efficient data collection while maintaining a substantial sample size from Jenin.

By combining complete enumeration for Tubas and convenience sampling for Jenin, we aimed to balance the need for representativeness with practical limitations, ensuring a robust dataset for analysis.

4.5 Statistical tests

The researchers used SPSS to analyze the data and employed the arithmetic mean, standard deviation, percentage, and degree to answer the relationship between the first and second questions and the third question using a multiple regression test.

4.6 Validity and reliability of the tool

The validity of the tool was confirmed by Abu Hashish and Al-Halimi (2023) through its distribution to a group of university professors, and its validity was established. A Cronbach's alpha test was conducted to assess the tool's reliability, yielding a coefficient of 0.817 for the first dimension, DT,' and 0.805 for the second dimension,' job performance evaluation.' This suggests that the questionnaire exhibits high reliability.

5 Results

5.1 Criteria utilized in the survey

The test chosen for this study was designed using a 5-point Likert scale. This was determined by calculating the score range (5–1 = 4) and dividing by the total number of options on the scale to determine the length of each interval (4/5 = 0.8). This value was then added to the lower bound of the range, which is 1, to determine the upper limit of each interval. The resulting interval lengths were determined and are shown in the following (Table 2).

To answer the initial question of this study:

The initial question of this study is: What extent of DT is observed within the Ministry of Education as per Palestinian government school principals?

To answer this question, means, standard deviations, percentages, and degrees were employed for each element of the first section of the survey related to DT. Here is an in-depth analysis of the outcomes.

TABLE 1 Sections of the questionnaire.

Items no.		
6	First Dimension: Strategies used for Planning DT	The first axis: DT
9	Second Dimension: Organizational Readiness for DT	
6	Third Dimension: Leadership Preparation DT	
21	Overall Degree DT	
15	Second Axis: evaluation of job performance	

TABLE 2 Measurement ranges and degrees of impact (adapted from Ozen et al., 2012).

Degree	Percentage	Cell length
Very Little	More than 20–36%	From 1,00–1, 80
Little	More than 36–52%	From 1,81–2,60
Medium	More than 52–68%	From 2,61–3,40
Great	More than 68–84%	From 3,41–4,20
Very great	More than 84–100%	From 4,21–5,00

5.1.1 Analysis of the first aspect of the paragraph: *Strategic Planning DT*

The results of the first dimension indicate that "*Strategic Planning DT*" is moderately executed, with ongoing endeavors to enhance planning and align it with technological and organizational advancements. Moreover, the involvement of all managers in decision-making concerning DT contributes significantly to the efficacy of digital planning procedures (see Table 3).

5.1.2 Analysis of the second aspect of the paragraph: *Organizational Readiness for DT*

The results of the second dimension indicate "*Organizational Readiness for DT*," which suggests an average level. This average signifies the presence of an institutional framework for DT within the Ministry of Education, indicating the institution's readiness for DT. While DT can contribute to achieving objectives related to employee performance evaluation, the results have been subpar, warranting a reassessment of these objectives. Furthermore, there is a need to develop oversight and potential reforms because the Ministry of Education does not allow teachers to access their evaluations (see Table 4).

5.1.3 Analysis of the third aspect of the paragraph: *Leadership Preparation for DT*

The results of the third dimension indicate "*Leadership Preparation for DT*," which revealed that the leader's preparation for DT was average. Allowing employees to access advanced performance assessment models positively contributed to their development and preparation for DT. Moreover, managers' knowledge of using DT tools in functional strategy was also rated as average. This underscores the importance of managers possessing knowledge about the utilization of digital tools (see Table 5).

5.1.4 Analysis of each section related to DT

The results showed that "*Strategic Planning for DT*" ranked first with a score of 3.34, which corresponds to a mean of 66.8%. The second dimension, "*Leadership Preparation for DT*," placed second with a mean of 3.04 and a percentage of 60.8%. Meanwhile, "*Organizational Readiness for DT*" came in third with a mean of 3.01 and a percentage of 60.2% (see Table 6).

To answer the second question of this study:

The second question of this study is: What process is employed by principals to evaluate the job performance of Palestinian government school teachers?

To answer this question, the mean, standard deviation, percentage, and degree of each survey element were calculated. Below is a detailed analysis of the outcomes:

The "*Evaluating the Job Performance*" results indicated that he received an average grade. The Human Resources Department analyzes the performance evaluation results, which aids in making decisions regarding job performance. The organization's internal forces collaborate with experts to set clear criteria for assessing employees' performance and contribute to achieving satisfactory

TABLE 3 Means (M), standard deviations (SDs), percentages (P), and degrees (D) for strategic planning for DT dimension 1.

Item 1	M	SD	*P*	D
A DT plan includes strategic thinking and mission, with various options considered.	3.32	0.578	66.4%	Medium
The development of DT, including policy and regulatory directions, is fundamentally being initiated.	3.29	0.916	65.8%	Medium
Multiple goals and diverse competencies are now being developed through DT.	3.25	0.826	65%	Medium
All managers participate in decision-making related to DT	3.46	0.902	69.2%	high
Advanced digital competencies are being prepared for DT	3.50	0.918	70%	high
Digital performance evaluation aids in measuring and planning career paths.	3.27	0.919	65.4%	Medium
Dimensions general score	3.34	0.843	66.8%	Medium

TABLE 4 Means (M), standard deviations (SDs), percentages (P), and degrees (D) for dimension 2: organizational readiness for DT.

Item 2	M	SD	*P*	D
The Ministry of Education has an organizational structure or unit dedicated to DT.	3.22	0.826	64.4%	Medium
DT includes an electronic system for evaluating performance.	3.07	0.947	61.4%	Medium
DT offers a transparent mechanism for analyzing digital assessment results.	3.01	0.792	60.2%	Medium
DT plays a role in achieving the objectives of employee performance appraisals.	2.90	0.754	58%	Medium
Digital performance appraisals assist in tracking employees' achievements.	3.15	1.021	63%	Medium
Digital performance appraisals help monitor employees' progress.	2.98	1.017	59.6%	Medium
Digital performance reports are regularly updated	2.96	0.918	59.2%	Medium
DT contributes to providing training tools and developing personal competencies.	3.03	1.077	60.6%	Medium
Employees can check evaluation results and file grievances using digital performance appraisal forms.	2.85	0.966	57%	Medium
Dimensions general score	3.01	0.924	60.2%	Medium

TABLE 5 Means (M), standard deviations (SDs), percentages (P), and degrees (D) for dimension 3: leadership preparation for DT.

Item 3	M	SD	*P*	D
Using digital performance appraisal forms, employees can examine digital competencies for job performance evaluation, including their own assessment and grievance procedures.	3.26	1.066	65.2%	Medium
Building school principals' digital competencies is one of the Ministry of Education's main goals.	2.95	0.867	59%	Medium
Through employee performance evaluation, managers participate in deciding the direction of change in metrics.	3.15	0.986	63%	Medium
Managers are skilled in using instruments related to DT to assess workers' productivity.	3.05	0.988	61%	Medium
Performance appraisal forms improve the work environment, increase employee loyalty, and develop a sense of belonging.	2.90	0.959	58%	Medium
Managers apply DT technologies to evaluate employee performance.	2.98	0.945	59.6%	Medium
Dimensions general score	3.04	0.968	60.8%	Medium

TABLE 6 Means (M), standard deviations (SDs), percentages (P), and degrees (D) for numerical transformation resolutions and rankings.

Item	M	SD	*P*	D
Strategic Planning for DT	3.34	0.843	66.8%	Medium
Organizational Readiness for DT	3.01	0.924	60.2%	Medium
Leadership Preparation for DT	3.04	0.968	60.8%	Medium
Dimensions general score	3.13	0.911	62.6%	Medium

TABLE 7 Means (M), standard deviations (SDs), percentage (P), and degree (D) for evaluating the job performance.

Item	M	SD	*P*	D
The Human Resources Department establishes the foundations and defined standards by which employees' performance is assessed in collaboration with experts.	3.39	0.979	67.8%	Medium
When necessary, the Human Resources Department changes to the assessment forms.	3.04	0.863	60.8%	Medium
The job descriptions of the employees serve as the basis for the development of performance appraisal forms.	3.06	0.876	61.2%	Medium
Standards for job discipline are emphasized as part of the performance review procedure.	3.18	0.864	63.6%	Medium
Employees' personal competencies are measured by the performance appraisal form.	3.01	0.828	60.2%	Medium
Performance evaluation reports are reviewed by multiple government agencies to guarantee impartiality, precision, and thoroughness.	3.16	0.864	63.2%	Medium
The outcomes of the performance review are examined by the human resources division.	3.27	0.917	65.4%	Medium
Forms for performance evaluations are used to inform decisions concerning transfers and promotions.	3.35	0.803	67%	Medium
The Resources Department plans employees' career paths using performance appraisal models.	3.26	0.954	61.2%	Medium
Evaluation forms are filled out once a year by the line managers	3.31	0.950	66.2%	Medium
The performance evaluation form is completed from multiple perspectives.	3.18	0.951	63.6%	Medium
Evaluation forms enhance employee participation in effective development.	3.08	1.029	61.6%	Medium
The employees are informed of the results of their annual evaluation.	3.26	1.040	65.2%	Medium
An employee may contest and file a grievance in relation to the performance appraisal results.	3.13	0.795	62.6%	Medium
The future performance of employees is expected by performance appraisal	3.07	1.033	61.4%	Medium
Dimensions general score	2.96	0.916	59.2%	Medium

performance results. Employees' awareness of their annual evaluation outcomes significantly enhances and develops their performance, leading to improved job performance evaluations (see Table 7).

To answer the main question of this research: What impact does DT have on the job performance appraisal process of Palestinian government school teachers from the perspective of their principals?

The researcher formulated the following hypothesis to address this question: There is no statistically significant impact, at the significance level ($\alpha \leq 0.05$), of what impact DT has on the job performance appraisal process of Palestinian government school teachers from the perspective of their principals?

Before testing this hypothesis, assumption checks were conducted to ensure the validity of the multiple regression analysis.

As discussed earlier, these tests included checking for outliers, collinearity, independent errors, normality, homoscedasticity, and linearity.

To address the hypothesis, the researcher utilized multiple regression analysis, as illustrated in Table 8, demonstrating the relationship between DT and job performance appraisal.

No outliers were detected in the data, as the minimum standard residual was −2.722 and the maximum standard residual was 2.187.

The results of the collinearity diagnostics indicate that multicollinearity is not a concern in the model. The Tolerance values for all predictors (Planning Strategies, Organisational Readiness, and Leadership Preparation) exceeded the threshold of 0.1, and the Variance Inflation Factor (VIF) values were well below the critical value of 10. These findings suggest no significant multicollinearity among the predictors, which supports the validity of the regression analysis (see Table 9).

TABLE 8 Tolerance and variance inflation factor (VIF) values for predictors.

Metric	Value
Minimum standard residual	−2.722
Maximum standard residual	2.187

TABLE 9 Collinearity statistics (Tolerance and VIF Values).

Predictor	Tolerance	VIF
Planning strategies	0.976	1.025
Organisational readiness	0.976	1.025
Leadership preparation	0.960	1.041

5.2 Independent errors

The assumption of independent errors was satisfied, as evidenced by the Durbin-Watson value of 1.963. This value indicates that the errors are independent, falling within the acceptable range of 1.5 to 2.5.

5.3 Random, normally distributed errors, homoscedasticity, and linearity

The histogram showed an approximately normal distribution with no extreme skewness, indicating that the normality assumption was met (see Figure 1).

Most points closely followed the diagonal line, suggesting a near-normal distribution of residuals with no major deviations (see Figure 2).

The residuals were randomly dispersed without patterns, supporting the assumptions of independence and homoscedasticity (see Figure 3).

The results of an independent multiple regression analysis on job digital transformation showed that "*Planning for DT*" had a significant impact on *Job Performance* ($p < 0.001$), and "*Organizational Readiness for DT*" had a marginally significant effect ($p = 0.697$). Additionally, "*Preparation for DT*" had a significant effect ($p < 0.001$, $p = 0.000$). The model also showed significance ($p < 0.001$), explaining (19.6%) of the variance in job performance (see Table 10).

Organizational Readiness is minimally correlated with *Job Performance*, the regression coefficient ($p = 0.697$). This could be due to several factors not accounted for in the current model, such as socio-cultural influences, limited resources, or resistance to change. These factors may diminish the impact of organizational

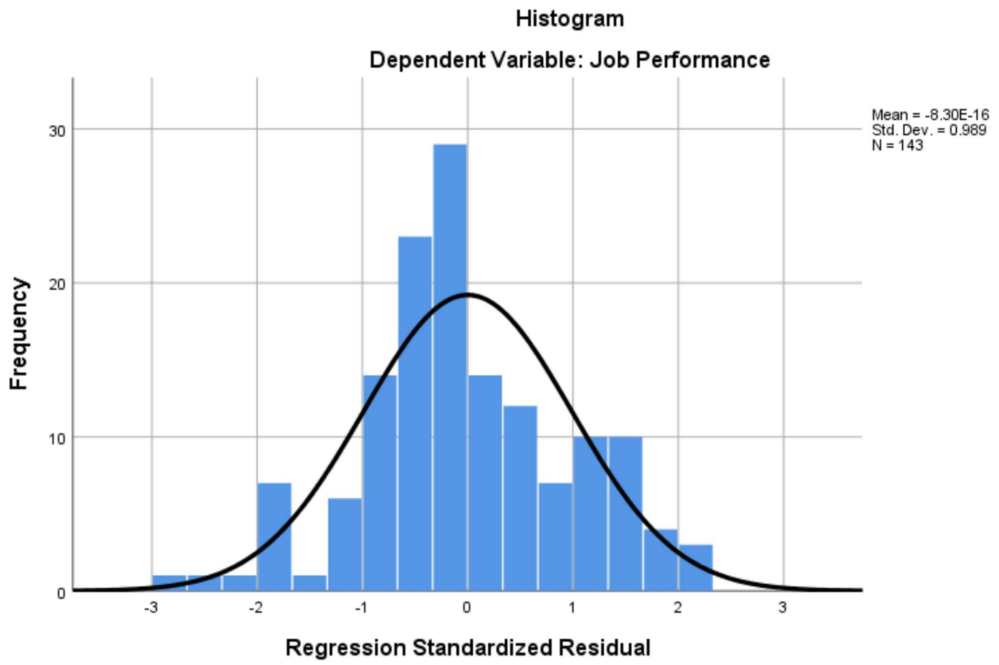

FIGURE 1
Histogram of standardized residuals.

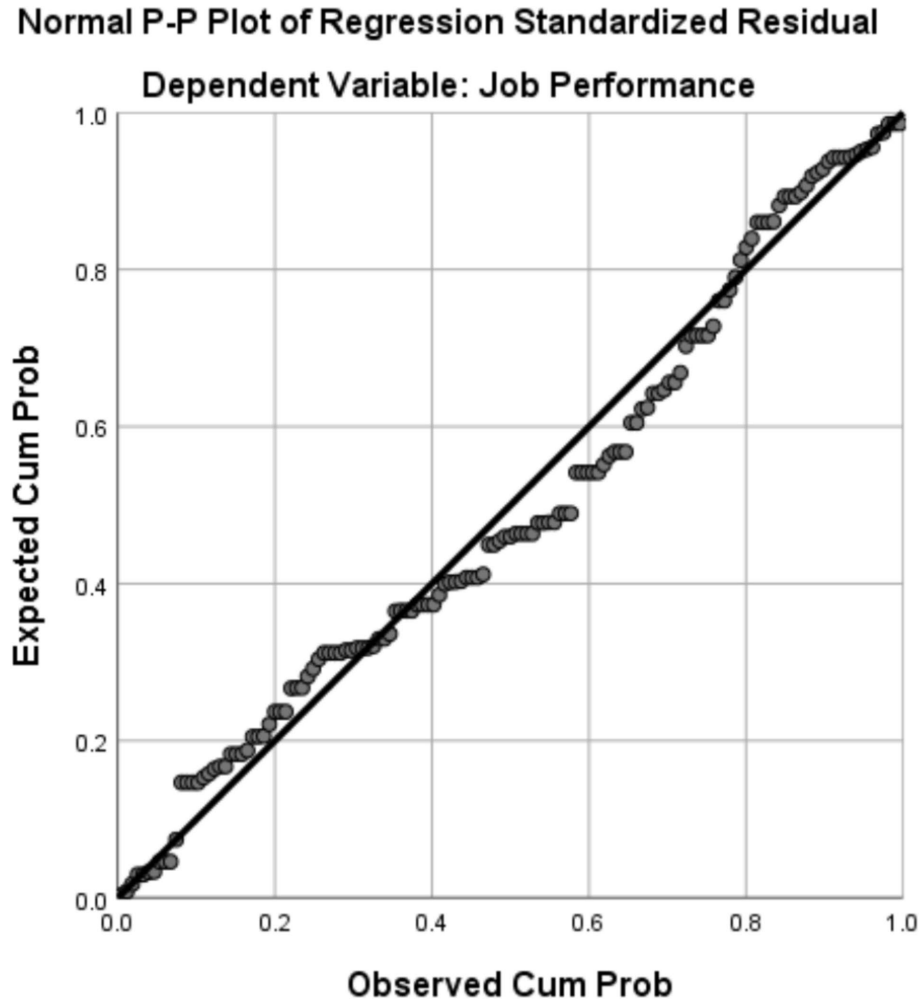

FIGURE 2
P–P plot of standardized residuals.

readiness on performance evaluation, especially in the context of the West Bank region, where challenges such as limited technological resources and economic constraints may affect the readiness of educational institutions for Digital Transformation (DT).

6 Discussion

6.1 Discussing the results related to the initial query

What extent of DT is observed within the Ministry of Education as per Palestinian government school principals?

The study's results emphasize the importance of various factors in keeping pace with developments in digital transformation (DT). The factor"*Strategic Planning for DT*" ranked first with a mean score of (3.34) and a percentage of (66.8%), highlighting the crucial role of effective planning in ensuring successful DT implementation within organizations. "*Preparing leaders for DT*" ranked second, with a mean score of (3.04) and a percentage of (60.8%). Underscoring the significance of leadership in driving DT initiatives and utilizing strategies to foster success. However, "*Organizational Readiness for DT*" ranked third, with a mean of (3.01) and a percentage of (60.2%). Despite the importance of supporting DT progress, this factor ranked last, indicating that educational organizations still need to improve their readiness by developing the necessary infrastructure, tools, and resources to successfully implement DT.

The overall average mean for all aspects of DT was 3.13 (62.6%), underscoring the need for educational institutions to take appropriate measures and design a comprehensive approach for successful adaptation to DT developments, from planning to implementation.

Previous studies have also supported the importance of planning and training in ensuring the success of DT implementation. For instance, Akash and Qasim (2021) noted that the readiness of educational institutions still requires significant development, while Balyer and Öz (2018) highlighted the need for a clear, coherent, and effective planned educational environment to ensure the success of DT processes. These findings emphasize that having the right resources and technological devices is a foundational step in the successful adoption of DT.

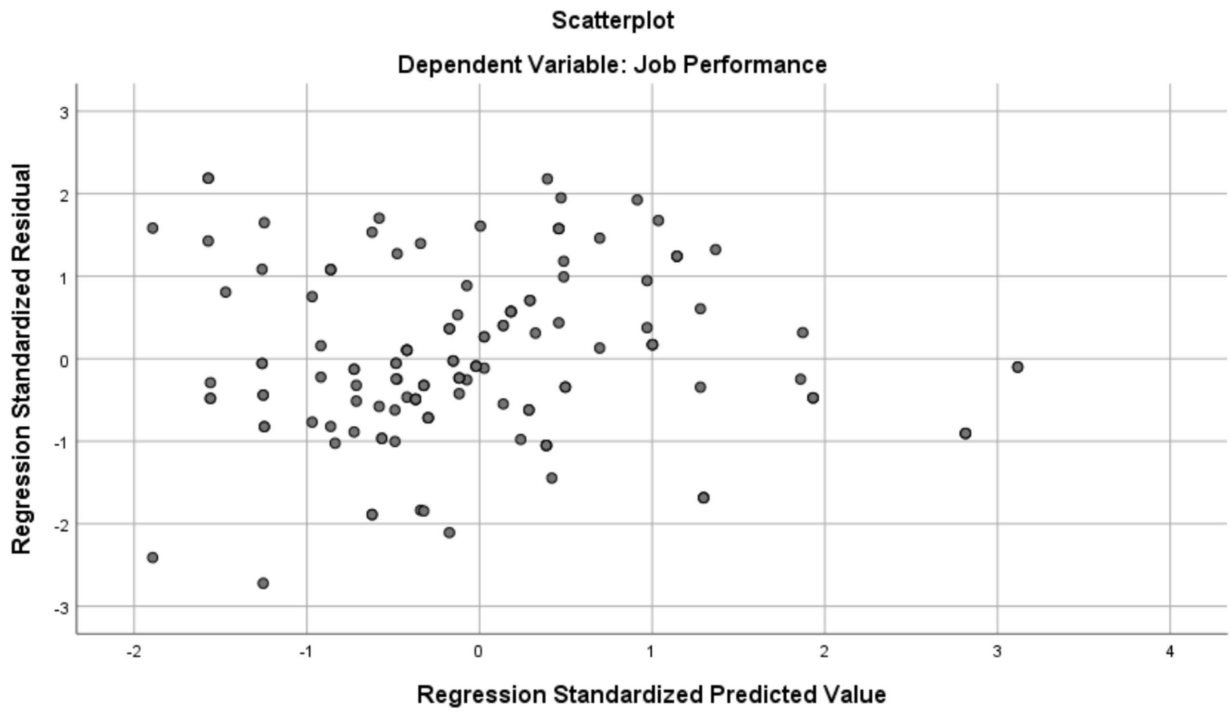

FIGURE 3
Scatterplot of standardized predicted values.

TABLE 10 Multi-regression analysis DT and evaluating the job performance.

Independent variables	Reg. B	Sig. value	Standard error	Beta	T. value	Sig level (0.05)
R2	26.350	0.000	04.759		5.537	Sig.
Dimension 1 planning for DT	0.510	0.000	0.141	0.277	3.603	Sig.
Dimension 2 Organizational preparedness for DT	0.049	0.697	0.124	0.030	0.390	Non-sig.
Dimension 3 Leadership Preparation for DT	0.526	0.000	0.134	0.305	3.930	Sig.
ANOVA						
F Test value	11.277		Sig.	0.000		
R2	0.196					

However, challenges remain, such as a weak technological infrastructure, which hinders the effective implementation of DT. Akash and Qasim (2021) found that schools olackck of modern devices and poor internet connectivity. Furthermore, psychological resistance to change among employees can also obstruct the adoption of the, study suggests that raising awareness among teachers through training programs and creating funding opportunities to strengthen technological infrastructure are essential to overcome these challenges steps.

Researchers assert that effective planning and training of leaders and educators must be interconnected and prioritized equally. It is essential for educational institutions and their leaders to develop comprehensive plans that include establishing the necessary systems and structures to ensure the successful implementation of DT.

6.2 Discussing the results related to the second query

What process is employed by principals for job performance evaluation of Palestinian government school teachers?

The study results also indicate that *Job Performance Evaluation* was effective due to the presence of clear standards and guidelines that determine the mechanism for evaluating effective work performance and predicting future performance. Developing these standards further will contribute to achieving various goals related to digital transformation (DT). Collaboration between the human resources department and specialists in establishing these standards significantly enhances the success of the evaluation process, making it more effective. However, submitting performance evaluation reports to

multiple independent bodies may lead to a lack of objectivity, potentially compromising the accuracy of the results.

In contrast, a study by Abu Hashish and Al-Halimi (2023) found that *while Job Performance Evaluation* was highly rated, preparing leaders for DT did not have a positive effect on job performance evaluation. This prompts us to explore the reasons behind the lack of correlation between preparing leaders for DT and evaluating employee performance. Research suggests that job performance evaluation practices should focus on varied strategies. Leaders must integrate DT into performance appraisal practices to achieve better outcomes. Additionally, training programs should be implemented to equip employees with skills aligned with organizational needs in the DT era.

To make the impact of DT more visible in job performance, tools such as *TeachBoost are* used by school principals in the United States (TeachBoost, 2024a,b). Can be employed. These tools offer an opportunity to manage and simplify the assessment process by providing customized forms, automating reports, and offering real-time feedback, thereby increasing the efficiency and transparency of teacher evaluations. Implementing similar tools in Palestine could help overcome existing gaps in the assessment process and strengthen overall performance evaluation efforts.

6.3 Discussing the results related to the main inquiry

What impact does DT have on the job performance appraisal process of Palestinian government school teachers from the perspective of their principals?

The results from the multiple regression analysis of Digital Transformation (DT) and Job Performance Evaluation revealed that *Strategic Planning for DT* had a significant impact on employee performance, with significance at ($p < 0.001$). Effective planning in DT processes positively influenced employee efficiency. This result supports the findings by Srisawat et al. (2024), who highlighted that proper planning and clear strategies are key to achieving successful digital transformation in educational institutions. Their study emphasized the importance of technology systems, staff skills, and infrastructure in ensuring DT success. This confirms the crucial role of strategic planning in ensuring the effectiveness of DT initiatives, as it provides clear direction and the necessary resources to improve employee performance.

In contrast, *Organizational Readiness for DT* did not significantly impact job performance ($p = 0.697$). This lack of significance may be explained by various socio-cultural factors in the West Bank region, such as limited technological resources, economic challenges, and resistance to change rooted in historical and political contexts. These findings are consistent with Akash and Qasim (2021), who found that educational institutions in Gaza faced similar challenges with inadequate resources, which hindered effective DT implementation. Similarly, Abu Hashish and Al-Halimi (2023) observed moderate organizational readiness and did not significantly affect performance evaluations, likely due to similar socio-economic constraints. Many educational institutions may lack the infrastructure and support needed for DT. Factors like organizational culture, leadership styles, and employee attitudes toward new technologies may also contribute to insufficient organizational readiness for DT. Other factors, such as limited training, low engagement, and unclear communication about DT goals within organizations, may also explain this non-significant result.

However, *Leadership Preparation for DT* was significantly related to job performance ($p = 0.000$), likely because leaders had the necessary skills to guide DT initiatives and improve overall organizational readiness. This finding aligns with Sararuch et al. (2023), who noted that strong leadership is a critical factor in facilitating DT. Their research found that leadership positively impacted staff attitudes, fostered an innovative culture, and helped overcome challenges related to technological changes. This suggests that leadership plays a central role in DT's success, as capable leaders can motivate staff, promote a culture of innovation, and address challenges related to technological adoption.

Despite the potential benefits of DT, several barriers hinder its effective implementation. One major obstacle is *technological infrastructure*, as many schools in the West Bank lack modern digital tools, face slow internet speeds, and use outdated software. These limitations reduce the effectiveness of digital performance evaluations and delay the adoption of new teaching methods. This challenge is consistent with Akash and Qasim (2021), who observed that technological infrastructure in educational institutions was suboptimal and needed improvement.

Another challenge is *staff resistance to change*. Teachers and administrators may be hesitant to embrace DT due to a lack of digital skills, concerns about increased workload, or uncertainty regarding the effectiveness of new evaluation systems. Resistance may also stem from traditional teaching and assessment methods, as Yildiz (2022) found that educators' reluctance to adopt digital tools significantly hindered the success of digital education. To address these issues, schools should invest in training programs that teach DT tools and how to use them for performance evaluations. Srisawat et al. (2024) emphasized that effective training and digital literacy were essential to overcoming these barriers.

Additionally, *creating a culture of innovation* within schools is important. Encouraging collaboration among educators, offering incentives for technology adoption, and considering teachers' feedback in DT initiatives can improve acceptance and effectiveness. Strong leadership is also necessary to promote a positive attitude toward digital transformation and ensure that technological advancements align with institutional goals, as Sararuch et al. (2023) pointed out.

From a policy perspective, the *Ministry of Education* should focus on improving technological infrastructure by allocating resources for upgrading school networks and providing essential digital tools. Additionally, incorporating DT strategies into national educational policies could provide a more structured approach to digital transformation, ensuring all stakeholders are adequately prepared. This approach aligns with Benavides et al. (2020), who argued that clear policies are crucial for guiding the digital transformation of educational systems.

Research indicates that *Strategic Planning for DT* and *leadership preparation* are the most influential factors in improving job performance, as they allow for better decision-making and enhance organizational capabilities. The lack of a meaningful impact from *organizational readiness for DT* could be attributed to insufficient training, disengaged employees, or ineffective communication of DT goals. These findings highlight the importance of improving DT

planning, leadership development, and organizational alignment to enhance performance in a digital context.

From a practical standpoint, schools should invest in professional development programs to better prepare principals and teachers for DT implementation. Creating an organizational culture that supports technological change is also crucial for ensuring the success of DT initiatives. Policymakers, particularly the *Ministry of Education*, should prioritize funding for improving technological infrastructure and offering targeted training programs based on the needs of schools in the West Bank. Akash and Qasim (2021) stressed the importance of improving technological infrastructure to support the effective integration of digital education.

This study contributes to the understanding of DT in educational settings, particularly in developing regions. It highlights both the challenges and opportunities and suggests that tailored strategies must be developed to address the specific socio-cultural and organizational dynamics of the West Bank. The theoretical implication of this research is that technology adoption models and organizational change strategies must take local factors into account to be effective, as noted by Benavides et al. (2020).

6.4 Recommendations

1 Educational organizations should develop comprehensive plans for DT that are consistent with the institution's goals and needs, taking into account its capabilities and available infrastructure. Such plans should include a comprehensive assessment of existing capacities, infrastructure, and resources, followed by the identification of measurable benchmarks against which to track progress

2 Teachers must receive ongoing training to stay abreast of digital developments and enhance their skills in alignment with the institution's needs. Such as using a learning management system, using artificial intelligence in assessment, and using data analytics to inform teaching and assessment. Training should be provided to match the digital transformation goals of the institution and ensure practical application in the classroom.

3 Efforts should be made to identify and resolve barriers preventing educational organizations from meeting the requirements of DT. Such assessments regarding organizational readiness using the Digital Capability Framework for Education can identify exact challenges, for example, regarding a gap in the infrastructure, or lack or inefficiency in the technology and tools being provided, or misalignment of top leadership priorities with the aims of DT.

4 Principals must allocate a portion of the available budget that would facilitate specific initiatives such as DT Leadership Workshops: Strategic planning, managing change, and building a digital culture. Teacher Training on Emerging Tools includes collaborative platforms like Microsoft Teams, Google Classroom, and adaptive learning technologies. Regular Audits: These will assess the effectiveness of these activities and help fine-tune strategies further.

5 It is advisable to train school leaders in targeted digital competencies using frameworks such as the institute standards for educational leaders. Training modules must focus on developing skills related to cyber security management, data-driven decision-making, and technology-enhanced organizational change.

6 Infrastructure gaps in educational establishments could be addressed through key strategic partnerships between themselves, the technology providers, and the local governments. These partnerships could eventually reduce the cost of hardware access and provide reliable Internet and cloud-based solutions at relatively lower costs. Initial implementations of digital tools would benefit from pilot programs aimed at real-world testing.

7 Limitations

The study sample was confined to government schools in Jenin and Tubas, representing only a fraction of the total number of cities on the West Bank, which comprises 18 directorates of education (Ministry of Education, 2023, June). Selection bias related to the sampling method and its geographic scope is, therefore, one of the limitations of this study. Our purposeful selection of only two cities—Tubas and Jenin—to conduct our study, together with the use of convenience sampling for selecting participants from Jenin, may not result in a fully representative sample of all public school principals across the West Bank. Consequently, this limitation would restrict our ability to generalize our results to other settings or populations. This limited geographic representation could potentially impact the applicability of the study's conclusions to the specific context of Palestinian education. Despite efforts to ensure diverse representation, logistical challenges and other constraints necessitated the focus on Jenin and Tubas. Consequently, caution must be taken when attempting to generalize the findings beyond these specific locales, as variations in socio-economic, cultural, and infrastructural factors across different cities may influence the DT landscape differently.

Therefore, the scope of future studies should be expanded to include different geographical areas in the West Bank, such as Nablus, Ramallah, Hebron, and others. This will enable a more comprehensive comparison of the challenges and opportunities related to DT in different socio-economic contexts.

8 Conclusion

Due to the significance of DT and its ongoing evolution, the study aimed to assess the preparedness of educational institutions for DT, prepare leaders for digital transformation, and plan for DT, alongside evaluating employee performance. One noteworthy finding is the need for Palestinian public schools to strategize and empower their leaders to align with DT. Consequently, educational institutions should incorporate this into their strategic planning to effectively adapt to DT and furnish their establishments with suitable infrastructure and technology. Additionally, leaders should undergo training to comprehend the significance of DT and ensure their adeptness in keeping abreast of technological advancements.

9 Future research

- Explore organizational readiness as a predictor of job performance, specifically investigating potential moderating or

mediating variables that shape this relationship, such as teacher motivation or school culture.

- Incorporate semi-structured interviews with school principals to gain deeper insights into their perceptions of Digital Transformation (DT) and its effects on teacher performance appraisal. This qualitative approach would complement the quantitative data and provide a richer understanding.
- Expand the geographic scope of the study to include additional regions within the West Bank, such as Nablus, Ramallah, and Hebron. This would allow for a comparison of the challenges and opportunities of DT in different socio-economic and infrastructural contexts, improving the generalizability of the findings.
- Investigate the cultural, organizational, and infrastructural barriers that impact digital transformation readiness, particularly in regions with limited technological resources. A comparative study across different regions or countries could help to understand these factors more comprehensively.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

MJM: Data curation, Formal analysis, Methodology, Project administration, Writing – original draft, Writing – review & editing. SS: Data curation, Writing – review & editing. MAM: Supervision, Writing – original draft.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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