

## THE LEVEL OF EMPLOYING EDUCATIONAL TECHNOLOGY BY BASIC EDUCATION TEACHERS IN LIGHT OF TOTAL QUALITY STANDARDS IN THE DIRECTORATE OF EDUCATION OF UNIVERSITY DISTRICT

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**Abstract:** This study aimed to investigate the level to which male and female basic education teachers employ educational technology in light of total quality standards within the Directorate of Education of the University District, and to examine differences according to gender, academic qualification, and years of experience during the first semester of the 2025/2026 academic year. The study adopted a descriptive survey design and utilized a questionnaire as the data collection instrument. The questionnaire comprised four main domains: learning objectives and competencies, assessment and measurement, educational materials and technology use, and learner support, accessibility, and interaction. These domains included 27 items, measured on a five-point Likert scale. The study sample consisted of 826 teachers, 39.9% male and 60.1% female, selected through simple random sampling. The results indicated that the overall level of technology use was high. Among the domains, assessment and measurement ranked first, followed by learner support, accessibility, and interaction, while learning objectives and competencies, and educational materials and technology use ranked lowest. The findings also revealed statistically significant differences in favor of female teachers, whereas no significant differences observed regarding academic qualification or years of experience. The researcher recommends leveraging female teachers' commitment to closely monitoring the educational process, providing continuous feedback, and creating interactive learning environments.

**Keywords:** Teachers; Basic Education; Educational Technology; Total Quality Standards; University District; Jordan.

### Introduction

Total quality and its standards are among the applications that educational systems have increasingly focused on in recent years, especially in light of the enormous scientific and technological explosion and the rapid pace of its integration into the educational process. Therefore, it has become necessary to regulate the educational process associated with learning and teaching technologies, which has driven educational institutions to adopt the principles and standards of total quality in the educational process and teaching practices.

In light of the continuous development of educational programs aimed at improving the quality of the educational process and enhancing the efficiency of teaching staff—who represent a key input in development processes—educational institutions, through planning and training, seek to focus on advancing teachers toward excellence and creativity in

accordance with total quality standards (Jens & Kai, 2005). Al-Khaldi (2012) argues that the close relationship between educational technology and the educational process requires reconsidering the employment of technological innovations across all their requirements in accordance with comprehensive standards that contribute to real and effective development of educational outcomes. This necessitates adapting educational technology and all its innovations within a comprehensive and well-studied framework based on total quality standards.

Al-Harhi (2014) asserts that the success of educational systems, in general, relies on adherence to global standards of education quality, particularly in the field of educational technology. Achieving quality in this domain requires three conditions: ensuring comprehensive and genuine development in learners' behavior and personality; aligning learners' needs with those of their surrounding community; and possessing the professional and skill-based attributes of the educational service provider, namely the teacher. Taima (2006) emphasizes that meeting these standards in educational technology is accomplished by focusing on the quality of training and professional guidance provided to teachers, as well as closely monitoring the implementation of educational and teaching practices in e-learning to achieve authentic objectives. This realized through evaluation processes based on total quality standards, enabling productive development through comprehensive review mechanisms. Accordingly, this study conducted to investigate the level to which male and female basic education teachers employ educational technology in light of total quality standards in the Directorate of Education of the University District.

### **Problem of the Study and Its Questions**

Educational technology has proven effective across all educational levels, particularly in basic education, and its importance has grown post-COVID-19 as digital tools and innovations became central to learning. Ensuring high quality and effective e learning requires implementing total quality standards anchored in recognized global criteria, rather than relying solely on technological advances without systematic evaluation. Field observations by the researcher revealed that the use of educational technology often lacks standardized implementation and depends on individual teachers' judgment, which may not align with students' learning styles or developmental needs. Supporting this, Hayat (2019) identified limited experience with educational technology as a key obstacle to its proper integration, while Al-Maaytah (2021) reported a moderate level of total quality standards application in distance education according to public school principals.

In light of the above, this study seeks to investigate the level to which male and female basic education teachers employ educational technology in light of total quality standards in the Directorate of Education of the University District. The study seeks to answer the following questions:

1. What is the level of employing educational technology by male and female basic education teachers in light of total quality standards in the Directorate of Education of the University District?
2. Are there statistically significant differences ( $\alpha = 0.05$ ) in the level of employing educational technology by male and female basic education teachers in light of total quality standards in the Directorate of Education of the University District attributable to the gender variable (male, female)?
3. Are there statistically significant differences ( $\alpha = 0.05$ ) in the level of employing educational technology by male and female basic education teachers in light of total quality standards in the Directorate of Education of the University District attributable to the academic qualification variable (Bachelor's, Master's, Doctorate)?
4. Are there statistically significant differences ( $\alpha = 0.05$ ) in the level of employing educational technology by male and female basic education teachers in light of total quality standards in the Directorate of Education of the University District attributable to the years of experience variable (1–5 years, 5–10 years, more than 10 years)?

### **Significance of the Study**

The study is significant for examining how male and female basic education teachers employ educational technology in line with total quality standards in the University District. Theoretically, it contributes to Arabic academic literature by addressing a relatively unexplored area and may inspire further research. Practically, it helps teachers apply technology effectively according to quality standards and provides guidance for decision-makers to enhance educational outcomes and design better educational content.

### **Objectives of the Study**

This study seeks to achieve the following objectives:

- To identify the level to which male and female basic education teachers employ educational technology in light of total quality standards in the Directorate of Education of the University District.
- To identify statistically significant differences ( $\alpha = 0.05$ ) in the level of employing educational technology by male and female basic education teachers in light of total quality standards in the Directorate of Education of the University District attributable to the variables of gender, experience, and academic qualification.

### **Terminology of the Study**

The current study includes several key terms, which defined conceptually and operationally as follows:

- **Educational Technology:** Zaytoun (2005: 23) defines educational technology as “a method of teaching using modern communication tools such as computers, networks, and multimedia including sound, images, graphics, search tools, and electronic libraries, as well as internet portals, whether in distance education or in the

classroom.” Operationally, the researcher defines it as all technological communication and interaction tools employed by male and female basic education teachers during classroom activities.

- **Total Quality Standards:** Al-Hilfawi (2011: 95) defines total quality standards as “model procedures for performance, evaluation measures, guiding principles for development and continuous improvement, and a decision-support tool.” Operationally, the researcher defines them as the items or statements that describe or govern the process of employing educational technology in a manner that ensures its quality, as represented by the study instrument prepared by the researcher for this purpose.
- **Basic Education Stage:** One of the stages of general education in the Hashemite Kingdom of Jordan, extending from Grade 1 to Grade 10. It is a compulsory stage of education.

### **Delimitations of the Study**

The delimitations of the study are as follows:

- **Spatial Delimitation:** University District / Amman Governorate.
- **Temporal Delimitation:** The first semester of the academic year (2025/2026).
- **Human Delimitation:** All male and female basic education teachers in schools of the Directorate of Education of the University District in Amman.
- **Topical Delimitation:** The study instrument designed by the researcher to identify the level to which male and female basic education teachers employ educational technology in light of total quality standards, in addition to the psychometric properties of the study sample.

## **Theoretical Framework and Previous Studies**

### **Theoretical Framework**

#### **The Concept of Total Quality Management (TQM)**

Total Quality Management (TQM) is a modern administrative concept aimed at achieving optimal and continuous performance improvement across institutions and organizations. It is considered an independent functional process that requires attention from administrative leadership (Ahmed, 2007). TQM evolved through cumulative developments in strategic quality management, integrating management, quality, and comprehensiveness (Ahmed, 2007). It combines managerial principles with innovative ideas and technical skills to enhance performance and overcome obstacles to organizational success (Al-Batti et al., 2022).

TQM directs employees to invest their talents effectively, fosters creative thinking, and implements integrated activities that improve institutional reputation and cultivate a work environment conducive to competitiveness and excellence (Al-Qahtani & Shaibi, 2022). It brings fundamental changes to organizational philosophy, objectives, and working styles, aiming for comprehensive improvements aligned with standards and customer expectations (Al-Bilawi et al., 2006). TQM also operates as an information-based managerial strategy that

systematically develops and utilizes employees' skills across planning, implementation, monitoring, and continuous improvement stages, ensuring consistency, sustainability, and long-term commitment (Iyad & Dahliz, 2007).

TQM emphasizes the interaction of inputs, methods, policies, and tools to achieve high-quality outputs through the active participation of all employees and continuous quality improvement (Jumaa, 2005). It aims to deliver value to internal and external beneficiaries by continuously refining administrative processes, enhancing performance, reducing completion time, eliminating non-value-added tasks, lowering costs, and meeting customer needs effectively (Kabendera, 2018).

### **General Concepts of the Philosophy of Total Quality Management**

The philosophy of Total Quality Management refers to the intellectual contributions of pioneers in TQM thought, particularly given its successful applications in many industrial societies. This indicates that TQM is not merely theoretical but practically applicable and proven successful. Al-Daradkeh (2006) suggests that this philosophy can view through several dimensions, including a strong desire to achieve excellence through a comprehensive organizational perspective focused on full customer satisfaction. This accomplished by creating an administrative environment that seeks continuous improvement of all processes and systems, emphasizing teamwork to prevent errors, focusing on design quality, reducing losses, and minimizing nonconformities.

Fadel and Yassine (2021) assert that the success of implementing a TQM system depends on top management's support and endorsement by creating a conducive work climate and organizational culture focused primarily on beneficiaries, supported by continuous performance measurement. This includes integrating quality into the organization's strategic planning through continuous education and training for all employees, including senior leadership, and effective human resource management. Continuous quality improvement requires involving all employees in performance enhancement efforts through establishing an accurate information system for quality management.

### **Objectives of Total Quality Management**

Achieving the highest possible level of satisfaction among internal and external beneficiaries can only realize by fostering a culture of institutional work that supports and maintains continuous improvement through establishing an integrated and well-organized administrative system, leading to increased productivity.

Majid and Al-Ziyadat (2007) argue that involving all employees in continuous improvement reduces routine procedures in terms of time and cost. Implementing TQM also contributes to human resource development, business sustainability, growth, and expansion, thereby enhancing the organization's competitive position. The primary objective of TQM programs is to improve the quality of products and services provided to customers, reduce costs, minimize wasted time and effort, improve service quality, and increase customer

satisfaction. Al-Ali (2008) highlights three benefits of applying TQM: cost reduction through doing things right the first time, reducing defects and rework; reducing task completion time by streamlining rigid and lengthy procedures; and achieving quality by developing products and services according to customer needs. Neglecting quality leads to increased task completion time, more monitoring activities, and increased beneficiary complaints.

### **Principles and Requirements of Total Quality Management**

The implementation of TQM relies on several principles, including continuous improvement of the current situation through system and process analysis, understanding cause-and-effect relationships using scientific methods, recognizing that people are the organization's most valuable resource, and developing them through education, training, and motivation. It also emphasizes quantitative methods, performance measurement and evaluation using standards, social responsibility, equality among employees, and empowering frontline workers as the best source for process improvement (Shahmohammadi, 2018).

### **Total Quality Management in Education**

Total Quality Management (TQM) has recently been applied in education as a modern administrative approach, following its success in other sectors. Its goal in education is to prepare students with the competencies needed to navigate rapid technological advancements, global communication networks, and the knowledge explosion, enabling effective engagement with modern challenges (Abu Abda, 2011). TQM was introduced to education in the United States through Malcolm Baldrige in 1981, who promoted its application across sectors, including education. In 1993, the Malcolm Baldrige Quality Award extended to the education sector, encouraging widespread adoption of quality practices. Although TQM began to be implemented in educational institutions during the 1980s, the first adopter remains unclear (Al-Shahari, 2005).

Emphasizing TQM in education does not mean turning schools into profit-oriented entities; rather, it focuses on adopting effective administrative and instructional approaches to achieve high-quality outcomes and meet learners' needs (Alawneh, 2007). Quality in education viewed through multiple dimensions, including objectives, inputs, processes, outputs, and institutional reputation (Al-Sulaibi, 2007). Overall, TQM supports preparing individuals and society to adapt to rapid technological and knowledge changes while promoting development and progress (Jolly, 2002).

Educational quality reflected in achieving sound learning outcomes, developing learners' thinking skills, values, creativity, and active participation across all educational stages (Idris et al., 2012). Education viewed as an integrated system involving shared responsibility among teachers, learners, families, schools, and communities to meet societal needs and promote development (Al-Fatlawi, 2008). TQM in education emphasizes strategic planning, continuous monitoring, human resource development, teamwork, and continuous improvement to achieve total quality standards (Al-Qahtani & Shaibi, 2022).

Quality standards define the criteria for teachers' performance and encompass all elements of the educational process, including inputs, processes, outputs, and feedback (Al-Shaeri & Kafafi, 2018). Implementing TQM enhances administrative effectiveness, performance quality, cooperation with society, and institutional belonging (Al-Ajez & Nashwan, 2005; Al-Bilawi et al., 2006). Educational institutions adopt TQM for its role in future planning, efficient resource use, curriculum development, and advanced evaluation methods (Ahmed, 2007). Successful implementation further requires employee participation, continuous training, delegation of authority, effective evaluation systems, and strengthened accountability to achieve desired educational quality outcomes (Abu Abda, 2011; Idris et al., 2012; Al-Shahari, 2005).

### **Previous Studies**

The researcher reviewed previous studies related to the current study. The studies presented chronologically from the most recent to the oldest, as follows:

Kaisoglu et al. (2023) conducted a study on the application of Total Quality Management (TQM) in primary education by examining teachers' views and the impact of their demographic characteristics. The study involved Greek public primary school teachers and used a validated structured questionnaire, with 2,088 completed responses analyzed using non-parametric tests. The results showed statistically significant differences in teachers' perceptions and application of TQM based on gender, job position, educational level, age, years of experience in physical education, and school location. These findings highlight variations in TQM implementation and suggest the need for further research to support its effective adoption in primary education settings.

Hamdan (2022) conducted a study to assess the degree of application of total quality standards in blended learning from the perspective of public school principals in the Second Zarqa Directorate, and to examine the effects of gender and educational stage on this application. Using a descriptive survey method, a validated and reliable questionnaire administered to a sample of 81 male and female principals of basic and secondary schools. The results indicated that principals rated the application of total quality standards in blended learning across all domains as high. No statistically significant differences found based on gender, while significant differences observed according to the educational stage.

Al-Qahtani and Shaibi (2022) conducted a study to evaluate the adoption of Total Quality Management (TQM) principles by senior management at the Jeddah Education Directorate and to examine the impact of TQM practices—covering leadership, employee participation, customer focus, continuous improvement, strategic planning, and operations management on individual and institutional performance. Using a descriptive-analytical design, data collected via a structured questionnaire from administrative staff, with a random sample of 372 respondents drawn from a total workforce of 11,320 using the Richard Geiger sampling formula. The study found that implementing TQM practices across all dimensions

significantly and positively improved both individual employee efficiency and overall institutional performance, thereby enhancing educational outcomes.

Al-Batti et al. (2022) conducted a study aimed at identifying the impact of Total Quality Management dimensions (top management conviction and support, teamwork, and employee training on administrative creativity. The descriptive analytical method and a questionnaire used to collect primary data. The study applied to employees of the Social Solidarity Fund in Sirte. The results revealed a significant effect of TQM dimensions on administrative creativity, with teamwork being the most influential dimension, followed by employee training, and then top management support.

Al-Nashri and Al-Nasser (2022) conducted a study aimed at examining the impact of applying TQM dimensions—(strategic planning, continuous improvement of university services, effective communication capability, and databased decision-making)—on improving organizational performance in several Saudi universities. Five universities selected as the field of application. The descriptive analytical method adopted using a questionnaire as the main data collection tool. The research population consisted of (2,727) faculty members, with (800) questionnaires distributed. The study found a statistically significant correlation and impact between the application of TQM dimensions and organizational performance in the investigated universities.

### **Commentary on Previous Studies**

Previous studies examined total quality standards mainly from administrative or instructional perspectives but did not specifically investigate basic education teachers' use of educational technology within this framework, nor compare male and female teachers. This gap highlights the originality of the current study, which links total quality standards with the practical use of educational technology at the basic education level. The study aligns with earlier research in emphasizing quality standards and adopting a descriptive methodology using questionnaires. Previous studies also informed the theoretical framework, instrument design, and data analysis, thereby strengthening the methodological and academic rigor of the current research.

## **Methodology and Design**

### **Methodology**

The study follows the descriptive survey method to assess the extent to which basic stage teachers employ educational technology in light of total quality standards in the Directorate of Education for University District. The study tool will consist of a questionnaire.

### **Study Population and Sample**

The study population included all basic stage teachers in the Directorate of Education for the University District during the 2025/2026 academic year (N = 2,754). A simple random sampling method used, resulting in a sample of 826 teachers (30% of the population),

comprising 330 males (39.9%) and 496 females (60.1%), ensuring adequate gender representation and enhancing the generalizability of the findings.

### **Study Tool**

The researcher developed a structured questionnaire to collect data on the extent to which basic stage teachers employ educational technology in accordance with total quality standards. The instrument consisted of two parts: the first gathered demographic and professional information, while the second included 27 items across four domains related to learning objectives, assessment, educational materials and technology use, and learner support. A five-point Likert scale used to measure teachers' perceptions and practices in line with total quality standards.

### **Validity**

The study tool reviewed by 14 experts, including professors from Jordanian universities specializing in educational and psychological sciences and PhD holders in educational administration and planning. Their role was to verify the tool's validity, provide feedback on the items, assess whether they aligned with the study objectives and intended domains, and evaluate the language, clarity, and appropriateness of each item. Based on their recommendations, necessary additions, deletions, and modifications implemented.

### **Reliability**

To ensure the reliability of the questionnaire, it administered to a pilot sample consisting of 30 teachers drawn from the study population but excluded from the main study sample. This preliminary application aimed to assess the internal consistency of the instrument and the degree to which its items consistently measure the intended constructs. Reliability calculated using Cronbach's alpha coefficient, which yielded a value of 0.91. This high coefficient indicates a strong level of internal consistency and confirms that the questionnaire is a reliable tool for data collection and suitable for use in the main study.

### **Statistical Treatment**

To address the study questions, statistical analyses conducted using the Statistical Package for the Social Sciences (SPSS). For the first question, arithmetic means, standard deviations, and ranks were calculated. For the second, third, and fourth questions, one-way ANOVA employed to determine whether statistically significant differences existed, particularly in relation to study variables.

### **Presentation of Results, Discussion, and Recommendations**

This section includes the presentation of the study results that reached by answering its questions, discussing the study results in light of its questions, and the recommendations derived from these results. The study results presented according to the sequence of its questions as follows:

## Presentation of Results

### Results of the First Question:

The research question—“What is the level of employment of basic stage teachers of educational technology in light of total quality standards in the Directorate of Education for the University District?” addressed by analyzing questionnaire data. Arithmetic means and standard deviations calculated for each dimension and for the overall level of technology use, providing a clear measure of how effectively teachers integrate educational technology according to total quality standards. Detailed results presented in Table 1.

**Table (1): Arithmetic Means and Standard Deviations for Questionnaire Dimensions and Overall Level**

Domain	Mean	Std. Deviation	Level
1. Learning Objectives and Competencies	4.16	0.586	High
2. Assessment and Evaluation	4.23	0.665	High
3. Educational Materials and Technology Use	4.16	0.558	High
4. Learner Support, Accessibility, and Interaction	4.18	0.686	High
<b>Overall Tool</b>	<b>4.18</b>	<b>0.548</b>	<b>High</b>

It appears from Table (1) that the overall mean for the level of employment of basic stage teachers of educational technology in light of total quality standards was high, with a mean of 4.18 and a standard deviation of 0.548. All questionnaire dimensions were also high, with Dimension 2 (Assessment and Evaluation) ranked first with a mean of 4.23, followed by Dimension 4 (Learner Support, Accessibility, and Interaction) with a mean of 4.18. Dimensions one (Learning Objectives and Competencies) and three (Educational Materials and Technology Use) ranked last, both with a mean of 4.16, also at a high level. Arithmetic means, standard deviations, and ranks for the items of Dimension 1 (Learning Objectives and Competencies) also calculated, as shown in Table (2).

**Table (2): Means, Standard Deviations, and Ranks for Items in Dimension 1 (Learning Objectives and Competencies), in Descending Order**

Item	Mean	Std. Deviation	Rank	Level
Considering individual differences in objectives	4.0367	0.96154	7	High
Clarity of criteria for achieving objectives	4.0459	0.84311	6	High
Clarity of expected learning outcomes	4.1101	0.72443	5	High
Alignment of lesson objectives with student needs	4.1193	0.75431	4	High
Appropriateness of objectives to required competencies	4.1651	0.75171	3	High
Measurability of objectives	4.3119	0.66245	2	High
Clarity of lesson objectives	4.3486	0.55069	1	High
<b>Overall Dimension</b>	<b>4.1625</b>	<b>0.58627</b>	-	<b>High</b>

Table (2) shows that the overall mean for Learning Objectives and Competencies was high (4.16, SD = 0.586), with all items at a high level. Item 1 ranked first (4.3486), and item 5-ranked last (4.0367). Arithmetic means, standard deviations, and ranks for the items of Dimension 2 (Assessment and Evaluation) calculated, as shown in Table (3).

**Table (3): Means, Standard Deviations, and Ranks for Items in Dimension 2 (Assessment and Evaluation), in Descending Order**

Item	Mean	Std. Deviation	Rank	Level
Variety of assessment methods to meet all student needs	4.1468	0.77967	5	High
Providing constructive feedback to students based on assessment	4.1651	0.77596	4	High
Clarity of assessment criteria	4.1927	0.93766	3	High
Teacher ability to monitor student progress and analyze results	4.2110	0.63935	2	High
Appropriateness of assessment tools	4.4404	0.59986	1	High
<b>Overall Dimension</b>	4.2312	0.66509	-	High

Table (3) shows that the overall mean for Assessment and Evaluation was high (4.2312, SD = 0.665), with all items at a high level. Item 9 ranked first (4.44), and item 10-ranked last (4.1468). Arithmetic means, standard deviations, and ranks for the items of Dimension 3 (Educational Materials and Technology Use) calculated, as shown in Table (4).

**Table (4): Means, Standard Deviations, and Ranks for Items in Dimension 3 (Educational Materials and Technology Use), in Descending Order**

Item	Mean	Std. Deviation	Rank	Level
Ease of student access to digital educational resources	3.9174	0.88326	10	High
Effectiveness of interactive educational media in motivating students	4.0275	0.79883	9	High
Employing digital tools in educational activities	4.0550	0.75566	8	High
Variety of materials to meet diverse student needs	4.0734	0.74170	6	High
Using educational software and applications to enhance active learning	4.0734	0.83562	6	High
Use of technology to enhance student understanding of content	4.1376	0.81044	5	High
Quality of educational materials used in lessons	4.2294	0.58741	4	High
Alignment of materials with learning objectives and competencies	4.3028	0.58539	3	High
Integration of technology with traditional teaching strategies	4.3394	0.58087	2	High

Updating educational materials and technology regularly	4.4587	0.56980	1	High
<b>Overall Dimension</b>	4.1615	0.55809	-	High

Table (4) shows that the overall mean for Educational Materials and Technology Use was high (4.16, SD = 0.558), with all items at a high level. Item 22 ranked first (4.4587), and item 19-ranked last (3.9174). Arithmetic means, standard deviations, and ranks for the items of Dimension 4 (Learner Support, Accessibility, and Interaction) calculated, as shown in Table (5).

**Table (5): Means, Standard Deviations, and Ranks for Items in Dimension 4 (Learner Support, Accessibility, and Interaction), in Descending Order**

Item	Mean	Std. Deviation	Rank	Level
Facilitating student access to resources and educational materials	4.0183	0.90248	5	High
Monitoring student progress and providing help when needed	4.0642	0.87427	4	High
Providing a supportive learning environment that encourages dialogue and cooperation	4.1560	0.69621	3	High
Enhancing student interaction and participation in learning activities	4.2385	0.82663	2	High
Providing individual support according to student needs	4.4128	0.59646	1	High
<b>Overall Dimension</b>	4.1780	0.68602	-	High

Table (5) shows that the overall mean for Learner Support, Accessibility, and Interaction was high (4.178, SD = 0.686), with all items at a high level. Item 23 ranked first (4.4128), and item 25-ranked last (4.0183).

### Results of the Second Question:

The research question "Are there statistically significant differences ( $\alpha = 0.05$ ) in the level of employment of basic stage teachers of educational technology in light of total quality standards in the Directorate of Education for the University District attributable to gender (male, female)?" addressed by calculating arithmetic means and standard deviations for each gender group. These measures enabled a comparison of technology use between male and female teachers. The results of this analysis presented in Table 6.

**Table (6): Means and Standard Deviations for the Level of Employment by Gender**

Variable	Category	N	Mean	Std. Deviation
Gender	Male	330	4.02	0.55
	Female	496	4.18	0.53

Table (6) indicates apparent differences in means. To determine the statistical significance of these differences, one-way ANOVA used, as shown in Table (7).

**Table (7): One-Way ANOVA Results for Differences in Employment of Educational Technology by Gender**

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Higher Group
<b>Between Groups</b>	1.215	1	1.215	4.012	0.046*	Female
<b>Within Groups</b>	249.583	824	0.303	-	-	-
<b>Total</b>	250.798	825	-	-	-	-

Table (7) indicates that there are statistically significant differences between groups in the employment of basic stage teachers of educational technology in favor of females.

**Results of the Third Question:**

The research question “Are there statistically significant differences ( $\alpha = 0.05$ ) in the level of employment of basic stage teachers of educational technology in light of total quality standards in the Directorate of Education for the University District attributable to academic qualification (Bachelor, Master, PhD)?” addressed by calculating arithmetic means and standard deviations for each qualification category. This analysis enabled a comparison of technology use across different academic levels to determine whether qualification significantly affects teachers’ integration of educational technology. The results presented in Table 6.

**Table (6): Means and Standard Deviations for the Level of Employment of Basic Stage Teachers of Educational Technology by Academic Qualification**

Variable	Category	N	Mean	Std. Deviation
<b>Academic Qualification</b>	Bachelor	624	4.1470	0.53005
	Master	186	4.3740	0.62360
	PhD	16	4.5067	0.85448

Table (6) indicates apparent differences in means. To determine the statistical significance of these differences, one-way ANOVA conducted, as shown in Table (7).

**Table (7): One-Way ANOVA Results for Differences in Employment Level by Academic Qualification**

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	0.801	2	0.400	1.341	0.266
<b>Within Groups</b>	31.651	824	0.299	-	-
<b>Total</b>	32.452	825	-	-	-

Table (7) indicates that there are no statistically significant differences between groups in the means for the level of employment of basic stage teachers of educational technology in light of total quality standards attributable to academic qualification.

### Results of the Fourth Question:

The research question “Are there statistically significant differences ( $\alpha = 0.05$ ) in the level of employment of basic stage teachers of educational technology in light of total quality standards in the Directorate of Education for the University District attributable to years of experience (1–5 years, 5–10 years, more than 10 years)?” addressed by calculating arithmetic means and standard deviations for each experience category. This analysis allowed comparison of technology use across different experience levels to determine whether years of experience significantly affect teachers’ integration of educational technology. The results presented in Table 8.

**Table (8): Means and Standard Deviations for the Level of Employment of Basic Stage Teachers of Educational Technology by Years of Experience**

Variable	Category	N	Mean	Std. Deviation
Years of Experience	1–5	150	4.2564	0.52555
	5–10	246	4.2067	0.47535
	More than 10	430	4.1566	0.57780

Table (8) indicates apparent differences in means. To determine the statistical significance of these differences, one-way ANOVA conducted, as shown in Table (9).

**Table (9): One-Way ANOVA Results for Differences in Employment Level by Years of Experience**

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.121	2	0.061	0.198	0.820
Within Groups	32.331	824	0.305	-	-
Total	32.452	825	-	-	-

Table (9) indicates that there are no statistically significant differences between groups in the means for the level of employment of basic stage teachers of educational technology in light of total quality standards attributable to years of experience.

### Discussion of the Study Results

#### First: Discussion of Results Related to the First Question

The study found that the overall level of basic stage teachers’ use of educational technology was high, with a mean of 4.18 and a standard deviation of 0.548. All questionnaire domains rated highly, reflecting teachers’ ability to integrate technology effectively in line with total quality standards. The Assessment and Evaluation domain ranked first ( $M = 4.23$ ), attributed to teachers’ diligence in designing competency-aligned assessments, monitoring progress, and providing constructive feedback that motivates active student engagement. The Learner Support, Accessibility, and Interaction domain ranked second ( $M = 4.18$ ), highlighting teachers’ capacity to create collaborative, inclusive learning environments, support individual students, and facilitate access to digital resources. The Learning Objectives

and Competencies and Educational Materials and Technology Use domains ranked slightly lower ( $M = 4.16$ ), suggesting room for further innovation and diversity in designing digital materials to meet varied student needs.

The high overall level of technology employment linked to the use of diverse digital teaching methods, such as interactive presentations, simulations, and electronic activities, combined with immediate feedback and ongoing teacher-student interaction. These practices foster active participation, self-directed learning, and constructive engagement, supporting the achievement of learning objectives and competencies and enhancing educational quality.

These findings align with Hamdan (2022), who reported high application of total quality standards in blended learning among public school principals in Zarqa, and Al-Qahtani and Shaibi (2022), who noted that total quality management improves individual and institutional performance. In contrast, they differ from Mokoloi et al. (2017) in Kenya, where TQM implementation was low, likely due to differences in resources and technological infrastructure.

### **Second: Discussion of Results Related to the Second Question**

The results showed that the mean score for female teachers ( $M = 4.18$ ) was higher than that for male teachers ( $M = 4.02$ ). One-way ANOVA revealed statistically significant differences in favor of females ( $F = 4.012$ ,  $p = 0.046$ ). This finding suggests that female teachers demonstrate a higher level of applying total quality standards in the educational process, particularly in designing assessment tools aligned with competencies, monitoring student progress, providing continuous feedback, and managing classroom interaction effectively.

This superiority may be attributed to female teachers' greater attention to instructional details, focus on interactive teaching practices, and provision of individualized student support, which enhance students' learning experiences and promote active and inclusive learning environments. Previous studies support this interpretation, indicating that female teachers are generally more committed to using technological and interactive tools and employing innovative teaching strategies than their male counterparts.

The observed gender differences are not necessarily related to academic competence but rather to teaching methods, adherence to modern educational standards, and the ability to create supportive and engaging learning environments. Psychological and behavioral factors, such as patience, perseverance, organizational skills in managing digital learning activities, and effective communication, may further explain females' relative advantage. These findings highlight the importance of considering gender differences in professional development programs, encouraging the adoption of effective practices across both genders to enhance overall educational quality. This conclusion is consistent with the findings of Kaizroglu et al. (2023), who reported significant gender differences in teachers' application of total quality management related to educational approaches rather than cognitive abilities.

### **Third: Discussion of Results Related to the Third Question**

The results indicated that teachers with higher academic qualifications slightly outperformed others in technology use (PhD: 4.51; Master's: 4.37; Bachelor's: 4.15), but ANOVA analysis showed no statistically significant differences ( $F = 1.341$ ,  $p = 0.266$ ). This suggests that academic level does not directly determine teachers' ability to integrate digital tools effectively. Instead, practical experience, continuous professional development, and active engagement with technology are more influential in enhancing teachers' digital competencies.

The slight advantage of higher-qualified teachers may reflect greater familiarity with modern technologies, but the findings demonstrate that all teachers, including those with Bachelor's degrees, can effectively employ technology when supported by training and development programs. These results align with both Arab studies (Al-Qahtani & Shaibi, 2022; Hamdan, 2022) and international research (Kaizroglu et al., 2023; Kakinjo & Likol, 2021), which emphasize that adherence to educational standards, participation in training programs, and ongoing professional development are critical for successful technology integration. Academic qualifications may influence certain aspects of performance, but the educational context, training opportunities, and practical engagement play a far greater role in determining effective technology use.

### **Fourth: Discussion of Results Related to the Fourth Question**

The results showed slight differences in technology use by teaching experience, with teachers of 1–5 years scoring highest ( $M = 4.2564$ ), followed by those with 5–10 years ( $M = 4.2067$ ) and over 10 years ( $M = 4.1566$ ). However, ANOVA analysis indicated no statistically significant differences ( $F = 0.198$ ,  $p = 0.820$ ), suggesting that experience does not strongly affect teachers' ability to integrate digital tools.

The minor advantage of less experienced teachers may reflect greater openness to innovative methods; while more experienced, teachers may rely on traditional approaches. This does not imply lower competence but indicates differences in adapting to new technologies. The findings also underscore the importance of professional development, workshops, and continuous support in standardizing technology use across all experience levels. Continuous training enhances teaching performance and fosters effective, innovative practices. These results align with Kaizroglu et al. (2023) and Kakinjo & Likol (2021), which highlight that experience alone, does not determine technology use, while professional development plays a key role in equalizing teacher performance.

### **Recommendations**

Based on the study results, the researcher proposes the following recommendations:

1. Enhance continuous professional development for teachers in using digital technologies according to total quality standards.

2. Encourage the use of interactive assessment methods and provide continuous feedback to students.
3. Develop digital learning environments that promote interaction, engagement, and easy student access to educational resources.
4. Foster innovation in designing digital educational materials to meet the diverse needs of students.
5. Leverage the successful practices of female teachers and encourage male teachers to adopt similar methods to improve teaching performance for all educators.

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