Learning support teacher competencies in dealing with digital learning units in Jordan

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Burhan Mahmoud Hamadneh[1+]

I'temad Khalid Malkawi[2]

[1,2]Department of Special Education, Faculty of Educational Sciences, Ajloun National University, Ajloun, Jordan.
[1]Email: b.hamadneh@anu.edu.jo
[2]Email: moodk7225@gmail.com

(+ Corresponding author)

ABSTRACT

This study investigates the competencies of Learning Support Teachers (LSTs) in utilizing digital learning units and explores differences based on gender, academic qualifications, and years of experience. A descriptive survey method was used, with a sample of 114 male and female LSTs randomly selected from public schools in Irbid Governorate during the second semester of the 2024–2025 academic year. Data were collected through an electronic questionnaire comprising 32 items across four domains: (1) essential digital learning competencies, (2) management of digital systems and content, (3) use of social media to enhance interaction in digital environments, and (4) integration of digital learning to support instruction and problem-solving. Results indicate that LSTs possess a moderate level of competence in using digital learning units. Significant differences were found in favor of teachers with postgraduate degrees and those with less than ten years of experience. No significant differences emerged based on gender. The study recommends that the Ministry of Education enhance digital teaching competencies among LSTs, particularly in supporting students with disabilities.

Contribution/ Originality: This study uniquely examines the digital competencies of learning support teachers in comprehensive public schools in Jordan, focusing on under-researched variables such as academic qualifications and teaching experience. It provides local insights into digital readiness to support students with disabilities, a topic rarely addressed in regional research.

1. INTRODUCTION

The evolution of the teaching and learning process, driven by modern educational trends and rapid technological advancements, has profoundly transformed the teacher's role. Rather than merely delivering information, teachers now act as facilitators, mentors, and designers of learning experiences who nurture critical thinking, creativity, and lifelong learning skills among students (Darling-Hammond, Flook, Cook-Harvey, Barron, & Osher, 2020). This shift necessitates a redefinition of teacher competencies, emphasizing the integration of pedagogical strategies with digital tools to foster student-centered learning environments. Teachers are now expected to personalize learning, manage diverse classrooms, and incorporate technological innovations that support educational equity and engagement (Crispel & Kasperski, 2019).

Given these developments, enhancing teachers' abilities in designing and utilizing electronic instructional lessons is no longer optional; it is a pressing imperative. The integration of technology in education not only strengthens the quality of instruction but also serves as a vital means to empower learners, particularly students

with disabilities, by providing adaptive, inclusive, and interactive learning experiences (Hamadneh & Almogbel, 2023). Effective digital education contributes to improved academic achievement, motivation, and the development of 21st-century competencies. Moreover, when properly implemented, it facilitates meaningful interaction and real-world application of knowledge, thus preparing learners for the demands of modern life and work (Alasmari, 2022).

The technological progress represents a qualitative shift in human life, creating new challenges, fostering creativity, and driving innovation. Technological innovations have significantly contributed to the development of various life sectors, especially education. Among these innovations, Digital Learning Objects (DLOs) stand out as a novel approach in educational technology. These objects are creatively designed for reuse across different instructional contexts using emerging information technology applications such as Flash software, Photoshop for image processing, Autodesk 3ds Max, 3D Studio, and Paint Shop (Stavermann, 2025).

Digital learning units have emerged as pivotal tools in contemporary education, enabling diverse modes of delivery and customization. They can be integrated through reusable content repositories, modular programming libraries, ready-made instructional packages, and open-access platforms, each requiring teachers to demonstrate high proficiency in instructional design and digital literacy (Abdel-Basit, 2011). These units are valued for their interoperability, scalability, and alignment with various curricular goals. Their modular design allows for adaptation across subjects and grade levels, facilitating both synchronous and asynchronous learning models. As educators are increasingly tasked with developing content suited for blended and remote learning, the ability to design and curate these digital learning units has become a key professional competency (Stavermann, 2025).

The advantages of digital learning units extend beyond flexibility. They promote cost-effective education by reducing reliance on traditional materials and enabling content updates without reprinting or redistribution. Moreover, these units support differentiated instruction, allowing students to progress at their own pace while receiving tailored support. Their reusability and sustainability also contribute to long-term curriculum development and innovation. Additionally, digital units promote collaborative content creation and knowledge-sharing among educators, much like the ethos of open-source software communities (Petrides & Jimes, 2010). This fosters innovation, teacher autonomy, and continuous improvement of teaching practices. Furthermore, their interactive and multimedia elements enhance student engagement and motivation, thus supporting deeper learning and the acquisition of critical 21st-century skills (Hamadneh & Almogbel, 2023).

Furthermore, developing educational content using digital learning units leads to the production of high-quality instructional materials that address learners' individual differences and educational needs. Their use also increases learning effectiveness and improves quality outcomes, while reducing cost and time in producing standard, high-quality learning materials (Rice & Ortiz, 2021). These tools empower educators to design learning experiences that are customized to each student's abilities and potential, thereby supporting the development of critical knowledge and skills. To effectively utilize these tools, teachers must acquire a range of key competencies, including proficiency in digital learning technologies, the ability to manage digital platforms and content, the strategic use of social media to foster engagement within e-learning environments, and the application of digital tools to enhance instructional effectiveness and problem-solving capabilities (Koehler, Mishra, & Cain, 2013; Mishra & Koehler, 2006).

Regarding teachers of students with disabilities, including those who teach students with learning disabilities, they have received increasing attention in training and professional development on technological innovations, particularly with the global focus on providing qualified educators for students with disabilities (Howorth, Marino, Flanagan, Cuba, & Lemke, 2024). These teachers have a distinct role compared to regular teachers, as they work with students who require special understanding due to their psychological characteristics, behaviors, needs, interests, and motivations. They must adapt strategies, methods, and activities suitable for the diverse levels and conditions of these students (Crispel & Kasperski, 2019).

Learning Support Teachers often undertake individual or small-group instruction outside the regular classroom, serving as primary facilitators for IEP development and implementation, coordinating with general educators, and leading administrative aspects of inclusive support services (Astudillo, Simón, & Fernández Blázquez, 2025). They work closely with general education teachers, families, and support staff to monitor student progress, adjust instructional strategies, and ensure that learners acquire not only academic knowledge but also cognitive, social, and emotional skills. Their work contributes significantly to fostering inclusive learning environments and promoting equity in educational outcomes (Hester, Bridges, & Rollins, 2020).

Given the centrality of their role, it is imperative to enhance LSTs' professional competencies to align with current scientific and technological advancements in special education. These teachers require advanced skills in educational planning, adaptive technology, and evidence-based instructional methods to effectively address the multifaceted challenges faced by students with learning disabilities. Moreover, continuous professional development is critical to equipping LSTs with the tools and strategies necessary for promoting autonomy, engagement, and achievement among their students (Crispel & Kasperski, 2019; Howard & Tondeur, 2023). In this context, investing in LST training not only improves educational quality but also strengthens broader efforts toward inclusive and equitable education systems.

In response, educational systems must prioritize keeping teachers up to date with the rapid digital and technological advancements of our era and ensure their effective integration into education (Stavermann, 2025). Some education systems have made it a goal for teachers to master digital learning units and apply them in their teaching practices to make learning more engaging, beneficial, and aligned with current digital trends (Crispel & Kasperski, 2019). In recent years, global education systems have increasingly prioritized the integration of technological innovations, such as digital learning units, adaptive platforms, and AI-based instructional tools into teaching and learning practices to enhance educational quality, competitiveness, and equity. This trend reflects a broader international commitment, including frameworks like UNESCO's Education 2030 agenda, which emphasizes inclusive, equitable, and technology-supported learning environments. The integration of digital learning units has shown particular promise in supporting personalized learning pathways, improving engagement, and fostering 21st-century competencies across diverse student populations, including learners with disabilities (Zizikova, Nikolaev, & Levchenko, 2023).

For students with disabilities, digital technologies provide flexible, accessible, and customizable solutions that address individual learning needs. Digital learning units can be adapted to multiple modalities, visual, auditory, and kinesthetic and can include features such as text-to-speech, captioning, interactive simulations, and assessment scaffolding. These innovations contribute not only to academic success but also to increased motivation, autonomy, and self-efficacy among learners. As such, the purposeful integration of educational technology within inclusive frameworks is now considered a key indicator of educational excellence and institutional responsiveness in the 21st century.

Therefore, the significance of this study lies in its focus on an important and emerging topic in educational technology: the competencies of Learning Support Teachers (LST) in handling digital learning units. It contributes to enriching both theoretical literature and empirical knowledge globally. The Ministry of Education may benefit from the study's results by gaining valuable insights into the current competencies of support teachers in managing digital learning units, which can inform improvements in teacher training and professional development centers. Moreover, the findings can assist policymakers and program planners by providing a comprehensive understanding of LST competencies, highlighting strengths and areas for enhancement. This guidance supports the development of effective strategies and the refinement of training operations aligned with program requirements and evaluation standards, ultimately improving teacher performance, especially in educating students with special needs (Desimone & Garet, 2021; Ertmer & Ottenbreit-Leftwich, 2020; Schleicher, 2020). Despite the considerable progress in training special education teachers, including support teachers in Jordan, several challenges still hinder the

achievement of the desired training outcomes. This was confirmed by a preliminary survey conducted by the current researcher, involving individual interviews with ten (LST) in Irbid Governorate. The interviews revealed inconsistencies and debates regarding their competency in handling digital learning units, specifically in terms of mastering essential digital learning skills, managing digital systems and content, using social media to enhance e-learning interactions, and employing digital tools to improve learning and solve problems. These challenges highlight the need for focused development in this area, particularly for teachers of students with special needs, including those with learning disabilities.

Accordingly, the study aims to answer the following research questions:

1. What is the level of (LST) competencies in dealing with digital learning units?
2. Are there statistically significant differences at the ($\alpha = 0.05$) level in (LST) competencies in dealing with digital learning units due to the variables of gender, academic qualification, and years of experience?

2. METHOD

2.1. Scientific Method

This study employed the descriptive survey method to assess the level of LST competencies in dealing with digital learning units and to determine whether statistically significant differences exist based on gender, academic qualification, and years of experience.

2.2. Study Population

The population of the study consisted of 230 males and females (LST) working in public schools in Irbid Governorate during the second semester of the 2024–2025 academic year, according to statistics provided by the Irbid Directorate of Education.

2.3. Study Sample

The study instrument was distributed to (LST) in collaboration with educational supervisors after receiving the necessary official approvals. The questionnaire was shared electronically via Google Drive and distributed through social media platforms used by support teachers. The link remained active for two weeks, from April 10 to April 24, 2025. A total of 114 (LST) responded to the instrument.

Table 1. Characteristics of the study sample by variables.

Variable	Category	Frequency	Percentage
Gender	Male	58	50.9%
	Female	56	49.1%
Years of experience	Less than 10 years	56	49.1%
	10 years or more	58	50.9%
Academic qualification	Bachelor's Degree	67	58.8%
	Graduate Studies	47	41.2%
Total		114	100.0%

Table 1 presents the demographic distribution of the study sample. The participants are nearly evenly split by gender, with 50.9% male and 49.1% female. Similarly, 50.9% of teachers have ten or more years of experience, while 49.1% have less than ten years. In terms of academic qualification, 58.8% hold a bachelor's degree, whereas 41.2% have completed graduate studies. The total number of participants is 114.

2.4. Study Instrument

The development of the study instrument was grounded in a comprehensive review of recent and relevant literature on teacher competencies, professional development, and educational technology integration. Key

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references that informed the design include (Desimone & Garet, 2021) who provide insights on effective professional development; Ertmer and Ottenbreit-Leftwich (2020) who examine the interplay of knowledge, confidence, and beliefs in teacher technology adoption; Schleicher (2020) offering broad perspectives on educational indicators and policy implications; and discussing technological pedagogical content knowledge frameworks. These sources collectively ensured that the instrument captures critical aspects of Learning Support Teachers' competencies in managing digital learning units. The final version of the instrument consisted of 32 items, distributed across four core competency domains:

1. Mastery of basic competencies necessary for digital learning.
2. Management of digital learning systems and digital content processing.
3. Use of social media applications to enhance interaction in electronic learning. environments.
4. Use of digital learning to improve learning processes and solve problems.

Respondents were asked to place a check mark (√) next to each item to indicate their level of skills and competencies in dealing with digital learning units. A five-point Likert scale was used, with the following response options: Very High, High, Moderate, Low, and Very Low. Scoring followed the scale used by Hamadneh and Almogbel (2023), assigning values of 5, 4, 3, 2, 1, respectively. The following interpretation scale was used to assess the instrument elements and overall result:

- 1.00 − 1.80 = Very Low.
- 1.80 − 2.60 = Low.
- 2.60 − 3.40 = Moderate.
- 3.40 − 4.20 = High.
- 4.20 − 5.00 = Very High.

2.5. Instrument Validity

To ensure content validity, the initial version of the instrument was reviewed by ten expert academic referees specializing in Educational Technology and Special Education from various Jordanian universities. The goal was to assess the appropriateness of the instrument in measuring the intended competencies. Based on their feedback, with an 80% agreement rate, the experts recommended several modifications to improve the clarity and measurability of the items. All recommended changes were implemented, and the instrument was finalized accordingly.

2.6. Instrument Reliability

The reliability of the study instrument was verified using two methods:

1. Test-Retest Method: The instrument was administered twice to a pilot sample of 20 (LST) individuals selected from the study population but outside the study sample, with a two-week interval between the first and second applications. Pearson correlation coefficients were then calculated for the total scores.
2. Internal Consistency Method (Cronbach's Alpha): Internal consistency reliability coefficients were computed for each domain and the instrument as a whole.

Table 2. Reliability Coefficients of the Study Instrument.

No.	Competency domain	Test-retest reliability	Cronbach's alpha
1	Mastery of basic competencies necessary for digital learning	0.75	0.73
2	Management of digital learning systems and digital content processing	0.71	0.76
3	Use of social media applications to enhance interaction in e-learning environments	0.82	0.79
4	Use of digital learning to improve learning processes and solve problems	0.81	0.83
	Overall instrument	**0.88**	**0.85**

As shown in Table 2, the test-retest reliability coefficients for the four domains ranged from 0.71 to 0.82, with an overall reliability coefficient of 0.88. The internal consistency reliability coefficients (Cronbach's alpha) ranged from 0.73 to 0.83, with an overall alpha of 0.85. These results indicate that the instrument has high and acceptable reliability, making it suitable for achieving the objectives of the study.

2.7. Study Limitations

The generalizability of this study's findings is subject to certain limitations:

- Subject Matter: The study is limited to investigating the level of competencies of (LST) in dealing with digital learning units in Irbid Governorate.
- Population: The study focused exclusively on (LST) working in public schools.
- Time and Location: The study was conducted in public schools in Irbid during the second semester of the 2024–2025 academic year.
- Instrument Validity: The generalization of the results depends on the external validity of the research tool i.e., its psychometric properties (validity and reliability). Since the tool is not standardized, the accuracy of the findings relies on the rigor in establishing the tool's validity and reliability, as well as the objectivity and seriousness of the participants' responses.

3. RESULTS

3.1. Results of the First Research Question:

What is the level of support for teachers' competencies in dealing with digital learning units?

To answer this question, means, standard deviations, rankings, and levels were calculated for the participants' responses regarding the competencies of (LST) in using digital learning units. Table 3 shows the results:

Table 3. Means, standard deviations, rankings, and levels of support for teachers' competencies in dealing with digital learning units.

No.	Competency domain	Mean	SD	Rank	Level
3	Use of social media applications to enhance interaction in digital learning	2.96	0.75	1	Moderate
2	Management of digital learning systems and digital content processing	2.87	0.71	2	Moderate
4	Use of digital learning to improve learning and solve problems	2.80	0.71	3	Moderate
1	Mastery of basic competencies necessary for digital learning	2.64	0.74	4	Moderate
	Overall score	2.82	0.68		Moderate

As shown in Table 3, the overall level of support for teachers' competencies in dealing with digital learning units was moderate, with a mean score of 2.82 and a standard deviation of 0.68. The highest-rated domain was the use of social media applications to enhance interaction in digital environments (mean = 2.96), while the lowest was mastery of basic digital learning competencies (mean = 2.64).

3.2. Results of the Second Research Question

Are there statistically significant differences at the level ($\alpha = 0.05$) in support teachers' competencies in dealing with digital learning units attributed to gender, academic qualification, and years of experience?

To address this, means and standard deviations were calculated for the different variables. Table 4 presents these findings.

Table 4. Means and standard deviations by gender, academic qualification, and years of experience.

Variable	Category	Mean	SD	N
Gender	Male	2.79	0.72	58
	Female	2.85	0.63	56
Experience	< 10 years	2.95	0.68	56
	≥ 10 years	2.68	0.65	58
Academic Degree	Bachelor's	2.65	0.73	67
	Graduate Studies	3.05	0.51	47

Table 5. Three-Way ANOVA for gender, years of experience, and academic qualification

Source	SS	df	MS	F	Sig.
Gender	0.266	1	0.266	0.639	0.426
Years of experience	1.817	1	1.817	4.357	0.039
Academic degree	4.147	1	4.147	9.943	0.002
Error	45.876	110	0.417		
Total	52.326	113			

The ANOVA results in Table 5 revealed: A) The finding of no statistically significant differences in support teachers' competencies based on gender (F = 0.639, p = 0.426) suggests that male and female teachers exhibit relatively similar levels of competency in dealing with digital learning units. B) The finding of statistically significant differences based on years of experience (F = 4.357, p = 0.039), with the advantage going to (LST) with less than 10 years of experience. C) The results indicate that there are statistically significant differences based on academic qualification (F = 9.943, p = 0.002), with a preference for teachers with postgraduate degrees.

4. DISCUSSION

The overall level of competencies among Learning Support Teachers (LSTs) in dealing with digital learning units was found to be moderate (M = 2.82, SD = 0.68). Notably, the highest-rated domain was the use of social media applications to enhance student interaction within digital environments (M = 2.96), while the lowest-rated domain was the mastery of basic digital learning competencies (M = 2.64). This pattern highlights a critical gap between general digital engagement and the pedagogically grounded use of digital learning tools in inclusive educational contexts. These findings suggest that while LSTs may be somewhat comfortable using informal or accessible technologies such as social media, they face significant challenges in applying structured, curriculum-aligned digital learning units, particularly for students with disabilities. Several barriers appear to hinder their effectiveness, including insufficient foundational digital skills, a lack of systematic training programs, limited availability of clear instructional models, and weak pre-service preparation focused on technology integration in special education (Alasmari, 2022). Furthermore, recent research confirms that many special education teachers struggle to adapt digital learning environments to the diverse developmental and cognitive needs of students with learning disabilities. The rigidity of some digital platforms, combined with the absence of adaptive features or culturally responsive content, often exacerbates exclusion rather than promoting inclusion. This gap calls for targeted professional development programs that prioritize hands-on experience with assistive and adaptive technologies, coupled with mentoring and ongoing support (Van De Oudeweetering & Voogt, 2022). Ultimately, improving LSTs' digital competencies requires a dual focus: enhancing their technical fluency and deepening their pedagogical understanding of how to employ digital tools effectively for students with learning difficulties. Without this balance, technology may remain underutilized or misaligned with learners' individual needs, reducing its intended impact on inclusive education outcomes.

The finding of no statistically significant differences in (LST) competencies related to digital learning units based on gender (F = 0.639, p = 0.426) suggests that male and female teachers demonstrate relatively similar levels of digital readiness and capability. This outcome reflects a broader trend in contemporary educational systems

toward gender parity in professional development and digital inclusion. One key factor behind this homogeneity is the equal access to in-service training programs that focus on ICT integration, digital pedagogy, and educational technology tools initiatives often designed and implemented in a gender-neutral manner by ministries of education in countries such as Jordan (UNESCO, 2022a). These programs promote inclusive participation, ensuring that both male and female educators are equally empowered to utilize digital resources in their classrooms. Moreover, the uniformity of pre-service teacher education further explains this result. Teacher preparation programs across Jordanian universities tend to follow standardized curricula, irrespective of gender, thereby offering equal exposure to digital tools, learning management systems, and online instructional strategies (Al-Adwan et al., 2023). This uniformity in educational experiences contributes to similar digital competency outcomes across male and female graduates. Additionally, the widespread availability of digital devices such as smartphones, tablets, and educational apps has contributed to a shift toward technology-neutral pedagogy. As digital tools have become more integrated into daily life, previous gender-related disparities in technology use have significantly diminished (OECD, 2023). Cultural and policy shifts have also played a pivotal role in narrowing the gender gap in digital literacy. In many Arab contexts, including Jordan, female educators are now active participants and sometimes leaders in educational technology initiatives. They frequently engage in local and international conferences, research, and pilot projects aimed at enhancing digital learning (Boser, Eckart, & Linn, 2022). Furthermore, the shared working conditions in public schools, such as equal access to infrastructure, student demographics, and administrative support, have helped ensure that both genders face similar opportunities and challenges when integrating digital tools. These findings carry important implications for practice and policy. Rather than designing gender-specific training programs, stakeholders should shift their focus to more influential variables, such as teaching experience, qualification levels, and subject specialization, which may show greater variation in digital competencies. Tailoring professional development to these factors can enhance the effectiveness and efficiency of capacity-building initiatives and ensure that all teachers, regardless of gender, are equipped to meet the demands of technology-enhanced education (Tondeur, Roblin, Van Braak, Fisser, & Voogt, 2020).

Recent evidence underscores that teachers with less than 10 years of experience often demonstrate significantly higher digital fluency compared to their more experienced colleagues. This generational divide stems not only from early and sustained exposure to digital technologies but also from the fact that younger educators have typically developed their technological skills organically through everyday use, resulting in more intuitive and confident integration of digital tools. A 2022 systematic review found that younger university instructors consistently self-report higher digital competence, while their senior counterparts often show moderate to low confidence in areas such as technology-enhanced assessment (Basilotta Gómez Pablos, Matarranz, Casado Aranda, & Otto, 2022). Similarly, a 2024 Turkish study applying the DigCompEdu framework revealed that chronological age and teaching tenure are not, by themselves, reliable predictors of digital competency, highlighting the importance of continuous, need-based professional development (Türkiye Ministry of National Education, 2024). Furthermore, a 2025 mixed-methods study demonstrated that even teachers with natural digital fluency require structured pedagogical support to effectively translate technical skills into impactful digital teaching practices (Ning & Danso, 2025). This advantage is further enhanced by the fact that recent graduates are more likely to have completed teacher preparation programs that integrate digital pedagogy, instructional design, and e-learning strategies. Moreover, the post-pandemic acceleration of digital education has particularly benefited early-career teachers, who began their professional journeys during a period marked by rapid technological integration in educational settings (UNESCO, 2022b). As a result, they tend to display higher adaptability, greater openness to innovation, and more frequent use of digital platforms in both personal and professional contexts (OECD, 2023). Collectively, these factors explain the competency gap and reinforce the need for differentiated, targeted professional development initiatives aimed at equipping veteran teachers with up-to-date digital pedagogical skills.

Recent evidence underscores that teachers with fewer than 10 years of experience often demonstrate significantly higher digital fluency compared to their veteran colleagues. This advantage arises not only from their early and extensive exposure to technology but also from the rigorous academic and professional training they receive. Postgraduate programs, especially in Jordan, embed deep coursework and research in educational technology, digital pedagogy, and instructional design, fostering profound theoretical and practical competencies in digital learning integration. Graduates of such programs possess refined critical thinking, analytical evaluation, and content-synthesis skills crucial for creating, adapting, and implementing pedagogically sound digital modules.

Moreover, these advanced-degree educators are more adept at reflective practice, continuously assessing and optimizing the efficacy of digital tools to accommodate diverse learners, including those with special needs. Their active participation in professional development conferences, specialist workshops, and research networks keeps them aligned with emerging trends in educational technology (Al-Adwan et al., 2023). A 2022 systematic review revealed that younger and postgraduate-educated teachers report higher self-assessed digital proficiency, while more experienced teachers often display moderate to low confidence in areas such as technology-enhanced assessment (Basilotta Gómez Pablos et al., 2022). A 2024 Turkish study using the DigCompEdu framework confirmed that neither age nor tenure alone reliably predicts digital competence, further emphasizing the importance of tailored professional support (Suzer & Koc, 2024). Similarly, a 2025 mixed-methods study showed that even digitally fluent early-career teachers require structured pedagogical guidance to channel their technical skills effectively into teaching practices (Ning & Danso, 2025). Other recent research in higher education also highlights that teachers engaged in postgraduate studies and continuous professional development are better positioned to drive blended and online learning, thanks to strengthened digital-pedagogical content knowledge frameworks that surfaced after the pandemic (Howard & Tondeur, 2023). These findings collectively underline that postgraduate academic training, combined with targeted, differentiated professional development, is key to bridging competency gaps and ensuring all educators, not just younger teachers, can proficiently integrate digital learning units.

5. CONCLUSIONS AND RECOMMENDATIONS

In light of the study's findings, there is an urgent need to develop a comprehensive national professional development strategy aimed at enhancing the competencies of support teachers, particularly those working with students with disabilities and special educational needs, in effectively integrating digital learning units. The data revealed significant gaps in digital proficiency, especially among teachers holding only bachelor's degrees and those with over ten years of experience, indicating a lack of ongoing professional renewal and a limited capacity to adapt to rapidly evolving technological demands.

Accordingly, the study offers the following recommendations:

1. For the Ministry of Education and Local Educational Directorates (e.g., Irbid Directorates).

- To improve the quality of technology-integrated education, it is essential to develop and implement specialized professional development programs that include strategic workshops and field-based digital integration initiatives that enhance teachers' digital teaching competencies. Furthermore, these efforts must be institutionalized by integrating digital competency standards into the National Professional Framework for Teachers. This includes formal recognition and assessment of digital teaching skills and their integration into teacher licensing, evaluation, and professional development systems.

2. For Educational Policymakers and Curriculum Developers.

- To ensure equitable access to quality education in the digital age, it is imperative to formulate and implement digitally inclusive education policies that prioritize the needs of all learners particularly students with special educational needs, by promoting the adaptation and customization of digital content. In parallel, a national, evidence-based teacher training model should be developed, integrating key components of digital pedagogy,

inclusive education, and instructional design rooted in contemporary educational technologies, thereby equipping educators with the skills necessary to deliver accessible and effective technology-enhanced instruction.

3. For Future Research.

• To build a more comprehensive and generalizable understanding of digital teaching competencies, future research should broaden its scope to include diverse geographic contexts, educational stages, academic disciplines, and age groups. Simultaneously, it is crucial to investigate the real-world barriers, contextual challenges, and innovative solutions related to the integration of digital learning units within inclusive classrooms. Such inquiry will inform data-driven educational reforms and foster sustainable professional development tailored to the dynamic needs of 21st-century teaching environments.

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