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Assessing Digital Training Needs of Faculties in Libyan Higher Education: A Case Study from the University of Zawia

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Abstract **Case Studies**

The research evaluates digital education requirements of University of Zawia academic personnel in Libya. A total of 534 participants from the 2,938 faculty members replied to the online survey which achieved a 20% response rate. The survey results show that academic staff heavily rely on basic office applications yet demonstrates substantial deficits in advanced digital capabilities for research and academic work. Only 23% of participants demonstrated advanced proficiency with footnotes yet most users faced difficulties when working with tables and images and using reference management software as well as plagiarism detection tools and statistical analysis tools. The unstructured answers from participants emphasized a critical demand for continuous e-learning training and organizational backing. The paper expands current understanding of Libyan higher education professional development needs while suggesting a structured training approach featuring e-learning coordinators and resource investments to fill observed knowledge gaps.

Keywords: Libya, Higher Education, Digital Training.

1. INTRODUCTION

Higher education faculty members across the globe must demonstrate digital competence as a fundamental requirement since the COVID-19 pandemic forced rapid adoption of online and blended learning methods. The process of preparing higher education staff for digital skills presents special difficulties for developing universities since they need to maintain high-quality education and research activities (Karimi & Khawaja, 2025; Tondeur et al., 2023).

Libyan universities face growing demands to enhance teaching standards while following international education benchmarks. The field lacks systematic studies about staff training needs for digital competencies according to Rhema and Miliszewska (2010) and Yahya et al. (2025). The research investigates digital training requirements at the University of Zawia to develop essential professional development recommendations.

Multiple frameworks exist to support digital competence development which are evaluated in the following section regarding their suitability for Libyan university staff digital skill enhancement.

2. LITERATURE REVIEW

2.1 Faculty digital competence frameworks

The worldwide educational institutions now view digital competence as a fundamental requirement for their teaching and university staff. According to Fernández-Batanero et al. (2021) competence extends beyond fundamental ICT knowledge because it consists of technical and pedagogical as well as ethical and organisational elements. The study draws its interpretation from multiple established frameworks which define and measure digital competence in its various aspects.

Educator competence according to the European Commission's DigCompEdu framework (Redecker, 2017) consists of six interconnected domains that include 22 competences in total. The first domain of professional engagement describes how educators employ digital technologies for communication along with collaboration and professional development. The second area of digital resources requires educators to locate learning materials while adapting them and creating new content for sharing and respecting copyright laws. The third area of the framework focuses on teaching and learning by showing educators how to design and control and guide digital learning experiences. The assessment domain of this framework

includes digital tool application for developing assessment methods and evaluating assessment results along with providing data-based feedback to students. The fifth section of the framework emphasizes technology's role in enabling accessible education while promoting inclusivity and individual student agency through personalized learning approaches. Educational institutions must focus on developing learners' digital competencies according to the sixth domain of this framework. The educators have a dual responsibility to master digital tools effectively and help their students achieve digital literacy. According to DigCompEdu educators need to advance from A1 Newcomer to C2 Pioneer levels for demonstrating progress. Staff members across the globe typically reach A or B levels in their digital competencies because they understand basic tools yet face challenges with pedagogical integration and assessment and learner empowerment (Redecker, 2017). According to Ghawail et al (2021) and Abdulsalam (2020) Libyan faculty members possess digital competence skills at the lower proficiency levels.

Tondeur et al. (2023) created the HeDiCom framework to handle the specific needs of higher education institutions. The framework distinguishes itself from standard frameworks because it focuses on the dual academic responsibilities of university staff who teach and conduct research. The framework establishes four separate domains of competence. The first domain of pedagogical digital competence focuses on designing and delivering teaching practices supported by digital tools and conducting reflective assessments of these practices. The second competency area known as empowering learners centres on developing learning environments that promote participation and digital inclusivity. Professional digital literacy makes up the third domain by describing staff capabilities for academic writing and data management and scholarly communication. The fourth domain of professional development and innovation emphasizes the need for ongoing learning as well as the strategic combination of emerging technologies. The four domains of the framework present the complete set of abilities needed for higher education by uniting teaching skills with research abilities and occupational competencies.

The UNESCO ICT Competency Framework for Teachers (ICT-CFT) provides a worldwide framework for understanding teacher digital competency (UNESCO, 2018). The framework structures teacher development through three distinct levels of progression. The initial stage of technology literacy focuses on teaching staff basic ICT skills for educational teaching and digital resource access. Teachers at the second stage receive training to utilize technology as a support system for inquiry-based and problem-solving activities that enhance disciplinary learning at advanced levels. At the final stage educators advance to become innovators who can create new teaching approaches and generate digital educational materials and contribute to societal knowledge development. The framework emphasizes policy alignment and curricular integration and equal access because of its strong focus on these elements which apply well to Libya's context where infrastructure varies and capacity development needs to connect with national strategic plans.

Two supplementary frameworks get regular references throughout academic publications. The ISTE Standards for Educators (ISTE, 2017) establish seven broad areas that include learner, leader, citizen, collaborator, designer, facilitator, and analyst. These standards aim to inspire teachers toward becoming both teaching innovators and responsible citizens while practicing educational methods. Research utilizes the Technological Pedagogical Content Knowledge (TPACK) model (Mishra & Koehler, 2006) as a prominent framework to describe where content understanding meets teaching approaches and technology utilization. Although TPACK lacks the operational structure of training programs compared to DigCompEdu and HeDiCom it remains significant for demonstrating that digital teaching effectiveness depends on uniting content knowledge with pedagogy and technology.

A comparative examination reveals many matching elements between these frameworks while each framework presents its own primary focus. The framework DigCompEdu enables detailed benchmarking through its structured progression levels. The framework HeDiCom extends the concepts from DigCompEdu to higher education staff roles by emphasizing research and innovation activities within digital competence development. The UNESCO ICT-CFT framework places digital competence inside a developmental framework that emphasizes equity and systemic alignment. ISTE and TPACK offer conceptual models that explain leadership and citizenship roles while showing how pedagogy interacts with content and technology even when other frameworks do not.

The Libyan higher education sector can use these frameworks as both evaluation tools and planning tools. The training model according to DigCompEdu should assist newcomer staff members who demonstrate digital competence at entry levels to achieve higher levels in specific domains including referencing, plagiarism detection and data analysis. The HeDiCom framework demonstrates high value in Libyan higher education because it demonstrates how staff need to develop their research capabilities (such as journal formatting and proposal writing and citation management) and transfer these skills to students through digital pedagogical practices.

The UNESCO ICT-CFT provides system-level insights that recommend connecting staff training programs to both Libya's 2023 Digital Transformation Strategy and Erasmus+ CBHE projects (IBTIKAR, WHEEL, HGRA) international collaborations. Training programs lack sustainability when they fail to receive policy-level backing according to previous research about Libyan HE (Rhema & Miliszewska, 2010; Ghawail et al., 2021; Yahya et al., 2025).

Digital competence frameworks demonstrate that the development of expertise beyond basic tool utilization requires systematic and progressive institutional capacity building. The frameworks establish that competence exists beyond technical skills because it includes pedagogical as well as ethical and organizational dimensions. This Libyan case study shows both the pressing need to implement these frameworks because measurable deficits exist alongside general agreement on these issues and their potential to direct national strategy development. The research positions the Libyan university's training program within established international competence

models to both assess local needs and participate in worldwide discussions about digital capacity development in higher education.

2.2 Training needs and professional development

A systematic global research indicates that staff members in higher education need basic ICT skills but encounter obstacles because they receive insufficient training and have insufficient technological infrastructure (Karimi & Khawaja, 2025). Micro-courses represent new models which have been tested worldwide as flexible professional development solutions (Trujillo-Juárez, 2025). The majority of structured training within Libyan higher education institutions has received funding from outside sources during recent years. The workshops together with curriculum innovation brought significant value but their continuity depended exclusively on outside financial support instead of domestic budget stability. Research conducted by individual studies shows that Libyan academics face digital competence gaps but targeted professional development programs have been implemented in recent years primarily through international partnerships and external funding instead of domestic programs. The Erasmus+ Capacity Building in Higher Education (CBHE) programme has made a significant impact on Libyan universities by supporting multi-year initiatives including IBTIKAR, WHEEL and HGRA that delivered workshops and governance reforms and new curricula through collaborative work with Libyan institutions. International organizations such as the International Organization for Migration (IOM) and the British Council together with EU-funded EU4SKILLS have offered training for staff and institutional development while exposing Libyan higher education leaders to European digital transformation approaches.

The programs demonstrate that external funding can drive progress but also show how institutionalized national backing creates stable development. Table 1 presents an overview of significant training and capacity-building programs in Libyan higher education since 2019 that includes their objectives alongside their activities and financing sources.

Table 1. Capacity-building and professional development initiatives in Libyan higher education

Programme / Initiative	Years	Main Focus	Example Activities	Funder / Lead
IBTIKAR (Erasmus+ CBHE)	2021–2025	Research capacity, innovation, academic staff training	National and institutional workshops on research project design, proposal writing, science communication (e.g. 3-day training at Misrata; weekly WP3 sessions at Sirte)	EU Erasmus+ CBHE, coordinated by UNIMED with 11 Libyan universities
WHEEL (Erasmus+ CBHE)	2019–2023	University governance, management, staff development	Creation of a national HE network, development of a Libyan HE Blueprint, training actions for senior staff	EU Erasmus+ CBHE, multi-partner consortium
HGRA (Erasmus+ CBHE)	2023–2026	Curriculum innovation & staff training on Migration & Development	WP4 training modules, workshops and roundtables with Libyan universities (including Zawia)	EU Erasmus+ CBHE, European & Libyan partners
IOM Train-the-Trainers (Tunis)	2025	Migration studies; staff training for Libyan HEIs	Intensive TOT programme for faculty from Benghazi and other universities	International Organization for Migration (IOM) with Libyan MoHE and Parliamentary Committee
EU4SKILLS / Study Tours	2025	Digital education innovation, curriculum design, VET–HE collaboration	Paris study tour for Libyan HE leaders on digital transformation and modern curriculum	EU-funded EU4SKILLS project
British Council initiatives	Ongoing	Education partnerships, English & PD	Short courses, workshops, and collaborative HE projects	British Council / UK Aid

2.3 Libyan higher education context

The research on Libyan higher education has repeatedly demonstrated inadequate institutional backing for digital teaching practices. The study by Rhema and Miliszewska (2010) documented institutional barriers in education while recent research shows that staff show enthusiasm yet structural barriers persist (Ghawail et al., 2021; Yahya et al., 2025). Strong evidence-based guidance stands necessary for developing effective training programs. The

research conducted by Yahya et al. (2025) verifies that Libyan universities have made progress in infrastructure development yet their digital education infrastructure remains underdeveloped because of poor training systems and inconsistent implementation especially in smaller universities as documented by Ahmed et al. (2025) during emergency remote learning phases. Ahmed et al's (2025) research at Wadi Alshatti University established e-learning continued operations yet it introduced major cultural and organizational and technological difficulties. The medical education sector faces low digital readiness in critical areas such as infrastructure development and pedagogical readiness according to Nasef et al. (2024). The study involved 17 medical faculties through a national survey which revealed that digital transformation awareness among leaders exists yet infrastructure disparities and equity issues need attention to satisfy accreditation and quality requirements. The Digital Transformation Strategy of 2023 positions higher education as a vital participant and EU4SKILLS has enabled Libyan HE leaders to experience digital innovations according to Zaptia (2024). This major EU and French co-funded initiative aims to enhance Libya youth employability through digital upskilling and institutional capacity development.

2.4 Capacity Building in Higher Education

Higher education reform debates increasingly focus on capacity building because institutions need to manage limited resources while adapting to fast technological advancements. Although professional development and capacity building sometimes share the same terminology they represent different implementation methods. UNESCO (2018) defines higher education capacity building as the process of improving people and organizational structures and educational infrastructure at individual and institutional and systemic education levels through investment. Bates (2019) emphasizes that digital education capacity building demands universities to build institutional frameworks that support ongoing innovation along with individual training programs.

Wider organisational frameworks should support digital competence capacity building after individual faculty skills improvement has started. Research evidence shows that structured continuous professional development initiatives that connect to faculty networks produce more lasting changes. According to Tondeur et al. (2019), staff training for digital skills should link technical and pedagogical skills training so faculty members can both learn technology use and effective teaching implementation of technology. Guskey (2002) argues that teacher change results from multiple continuous training sessions rather than a single workshop event because new practices need sustained development to become established.

Several digital capacity building models have received international testing during implementation. The "cascade training" model functions as a widely adopted method where small groups of faculty members attend extensive training before teaching other department members. The model has shown favourable outcomes in various scenarios because it addresses situations where resources are limited (Trujillo-Juárez, 2025). Faculty learning communities function as a model by which staff members join collaborative efforts to implement digital skills while evaluating their teaching practices (Wenger, 1998). Both methods demonstrate that capability development requires more than transferring information because it establishes settings that foster collective work and career development.

The capacity building process in developing and transitional higher education systems encounters unique obstacles. The development of capacity building in low- and middle-income countries shows multiple challenges since it remains scattered and heavily dependent on donor support but lacks institutional integration within universities according to Altbach and de Wit (2018). The short-term nature of educational programs creates an environment where obtained progress disappears when financial support ends or when institutional backing is absent. The Middle East and North Africa region demonstrates persistent barriers to sustaining capacity development because of insufficient infrastructure alongside weak professional development support and inconsistent faculty participation (Ghawail et al., 2021).

The situation in Libya presents additional challenges for these obstacles. Rhema and Miliszewska (2010) documented that Libyan higher education institutions encountered structural barriers to ICT adoption through inadequate training and weak institutional systems during the previous decade. Research by Yahya et al. (2025) shows digital education platform adoption has increased but professional development programs for academics remain underdeveloped thus producing uneven staff competence levels. The study conducted by Ghawail et al. (2021) shows that faculty members and students want e-learning but their aspirations remain unfulfilled due to limited resources and insufficient training opportunities. The research findings show that Libyan higher education needs capacity building as an immediate priority to enhance human and institutional capabilities.

The development of staff capabilities forms an essential link with both quality assurance processes and student achievement results. The DigCompEdu framework by Redecker (2017) which Europe widely uses defines educator competence as an essential quality indicator for digital education that combines technical abilities with pedagogical and assessment skills. The investment of funds into staff competence development produces quantifiable advantages for students according to empirical research evidence. The study conducted by Fernández-Batanero et al. (2021) proves that students benefit positively from ICT training which enhances their learning environment while Dang (2024) reveals higher lecturer digital competence leads to better student results. The research evidence shows that capacity building serves dual purposes because it develops staff skills and enhances institutional performance and produces better student results.

The research demonstrates that building capacity needs coordinated efforts across individual, faculty and institutional levels for its successful implementation. Training programs in higher education institutions that serve developing contexts need to be viewed as a part of ongoing educational processes rather than standalone interventions. Universities need to establish professional development systems which create

sustainable environments through collaborative networks and technological and organizational infrastructure that enables change initiatives. The evidence from Libya indicates that without comprehensive systemic investment digital teaching practices will persist in an unstable state. The study enhances existing literature by analyzing digital skills training needs of University of Zawia faculty staff in the first section.

3. METHODOLOGY

A cross-sectional online survey served as the research method to determine academic staff training requirements. The research population consisted of all 2,938 employees from the faculties at a major Libyan university. The survey obtained responses from 534 participants who made up about 20% of the total population.

The questionnaire used for data collection included sections for demographic data and software application usage as well as self-assessments of digital academic abilities. The measurement of most skill areas utilized Likert-scale items yet open-ended questions allowed participants to share their training needs and preferences through their own written words.

The study employed quantitative alongside qualitative analysis methods. The analysis used descriptive statistics to evaluate closed-response data because it revealed both software usage patterns and competence levels. The thematic coding method analyzed open question responses to reveal recurring concerns and suggestions for interpretation. The dual approach merged general skill distribution knowledge with staff training priority and expectation insights.

Survey-based research contains several inherent constraints which researchers should recognize. The 20 percent response rate enables exploratory analysis yet limits generalizability since some faculty departments along with particular ranks might not be adequately represented. Self-reported competence assessments in the survey might lead to response bias because some staff might either inflate or deflate their actual skill levels. The study uses a cross-sectional approach to measure staff needs but it does not show how needs change with technology advancements or organizational policy changes and staff development programs. The study delivers important foundational information for creating structured training programs but readers should remember these study limitations during interpretation.

4. RESULTS

The university survey collected responses from all 29 faculties although participation levels differed between different fields of study. The Faculty of Medicine recorded the highest number of participants with 75 respondents whereas the Faculty of Sharia had only two participants. The study consisted mainly of lecturers who made up 37.2 percent of the sample with 199 participants while teaching assistants comprised only 0.6 percent with three participants.

The majority of participants (94.4%) used Microsoft Word as their most frequently employed application. PowerPoint was also common, with 72 per cent indicating regular use, while Excel was less prevalent at 41.5 per cent. The employees primarily used basic office tools because specialist data analysis and reference management software appeared infrequently in their workflow.

The assessment of particular academic digital skills by participants showed extensive knowledge deficiencies. The assessment results showed that 23% of participants achieved excellent results in using footnotes and references while more than 70% struggled with document table and image insertion and formatting. Staff members demonstrated weak confidence in their use of reference management software together with manuscript formatting for journal submission and plagiarism detection tools. The survey results showed that most staff members lacked proficiency with statistical software packages which indicated widespread requirements for data analysis training.

The qualitative feedback from respondents supported the observed patterns. The survey received 267 open comments from participants who mainly stressed the need for required e-learning training. The respondents showed interest in receiving scheduled workshops and seminars to develop hands-on abilities although some staff members wanted online courses for flexible learning. The responses indicate that staff members both understand their skill deficiencies and actively want professional development opportunities when institutions provide necessary backing.

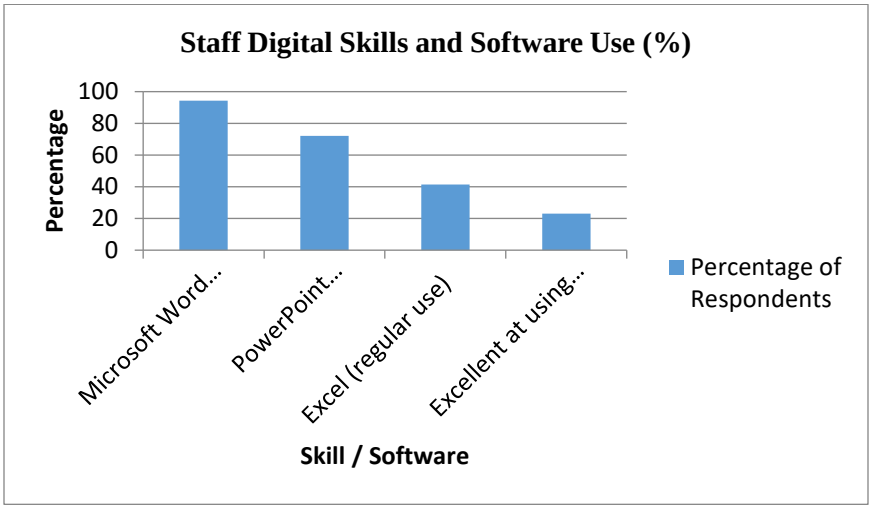
The survey results indicate that staff demonstrate strong proficiency with fundamental office software applications but demonstrate weakness in essential digital competencies needed to achieve academic and educational excellence (see Table 2 and Figure 3). Staff members showed weak competence in referencing and plagiarism detection and data analysis and manuscript preparation according to survey results which demonstrated that most employees needed improvement in these areas. The high number of open responses demonstrates staff requirements for mandatory training programs which will help develop institutional training initiatives. The data demonstrate specific training needs of staff members which confirms the necessity for institutional capacity development programs.

Table 2. Summary of Staff Digital Skills and Software Use

Skill / Software	Percentage of Respondents	Notes
Microsoft Word (regular use)	94.4%	Most widely used software
PowerPoint (regular use)	72.0%	Common presentation tool
Excel (regular use)	41.5%	Less frequently used

Excellent at using footnotes/references	23.0%	Only 23% reported excellent ability
Difficulty inserting/formatting tables & images	Over 70%	Majority reported difficulty
Confident with reference management software	<10%	Very low confidence reported
Confident formatting manuscripts for journals	<10%	Very low confidence reported
Competent with plagiarism detection tools	<10%	Very low confidence reported
Competent with statistical/data analysis tools	<10%	Very low confidence reported

Figure 3. Faculty digital skills



The combined quantitative results and qualitative feedback demonstrate identical needs and priorities of staff members. The survey results show insufficient advanced academic digital skills among faculty members yet open-ended answers demonstrate their clear identification of these skills deficits. The survey data show staff recognize their skills deficits and show active participation in institutional training programs that are mandatory. The collected perspectives enable proper interpretation of survey results and support the design of professional development strategies that fulfil identified needs according to existing research. The patterns match research findings from international sources which receive additional examination in the next section.

5. DISCUSSION

The research investigation examined digital training requirements for Libyan University of Zawia academic staff and established methods for institution-based capacity development. The research results demonstrate that basic digital activities differ significantly from the sophisticated educational and academic abilities required to deliver excellent higher education quality. The majority of respondents (94.4%) use Microsoft Word and (72%) use PowerPoint frequently yet their expertise regarding academic writing and research integrity and data-informed practice is low. Footnote and reference management skills showed only 23% excellence and more than half of respondents experienced trouble with formatting tables and images and operating reference managers and plagiarism/similarity tools and journal-style formatting software and statistical analysis packages. The open responses from 267 participants reinforced the quantitative data by specifically demanding organized e-learning training for everyone. The international research conducted by Altbach & de Wit (2018) reveals that voluntary training programs fail to create institutional-wide improvements, yet the Libyan educational system demands mandatory training to achieve structural changes.

5.1 Interpreting the Findings

The gathered data demonstrate that the staff members are active digitally while they lack academic digital fluency. Staff members have developed fundamental skills to use Microsoft Office tools but their proficiency in using technology for scholarly work remains basic. Studies from around the world show that faculty members reach basic ICT literacy yet encounter obstacles when trying to use technology for pedagogical purposes and scholarly research (e.g., systematic reviews of HE digital competence; frameworks such as HeDiCom and DigCompEdu). Teaching and research activities retain their fundamental elements from the epistemic core even though technology exists as a tool for support.

The gap between staff proficiency and institutional requirements can be explained through multiple factors. Training initiatives that occur only once or sporadically focus on particular software tools without teaching how these tools help achieve academic and educational objectives. Thirdly, staff must take responsibility for their professional development since the existing institutional support systems are minimal; consequently, motivated staff members advance but others stop progressing.

5.2 Capacity Building Lens

This digital learning gap requires understanding through capacity building perspectives. Capacity building provides a different approach from basic "skills deficit" assessments because it recognizes that improvement requires development across multiple levels that strengthen (a) individual capability; (b) organizational structures and cultures; and (c) systemic conditions (policies, infrastructure, quality regimes) that enable sustained change (e.g., UNESCO; Bates). The survey findings reveal problems that extend past personal skill gaps because the institution needs to establish an architecture which promotes advanced digital academic work as an institutional norm.

These findings support the importance of using training programs that incorporate competence frameworks which help define clear expectations and assessment standards. The European DigCompEdu framework together with HeDiCom and other higher education digital competence models describe professional practice and digital resources and teaching and learning and assessment and learner empowerment and staff development. Training programs that align with these frameworks enable staff members and units to identify career development paths while allowing institutions to establish incremental goals which include reference management proficiency at "proficient" level for all lecturers by Year 1 and digital assessment design at "advanced" level for programme leaders by Year 2. The approach rejects traditional tool-centered workshops by maintaining concentration on skills development and performance targets. The specified targets are both measurable and achievable and relevant and timely and defined by the SMART objectives framework.

5.3 Implications for Teaching Quality and Student Outcomes

The implementation of capacity building serves as an educational quality initiative rather than a staff development initiative. Research conducted by Dang (2024) and Fernandez-Batanero (2021) across various educational contexts demonstrates that lecturer digital competence improvement results in better student learning environments and educational results (studies link ICT training to student experience and digital competence to learner achievement). The improvement of reference and plagiarism detection skills decreases academic misconduct while promoting programmatic scholarly writing. Strong data literacy abilities lead to better curriculum evaluation methods and learning analytics implementation and better design abilities enable inclusive digital learning activities that promote student interaction. The Libyan HE environment which faces resource limitations and student varying digital academic backgrounds makes staff upskilling an effective strategy for educational quality improvement.

The Libyan HE system faces challenges from unequal infrastructure distribution and scattered professional development services (Rhema & Miliszewska, 2010; Ghawail et al, 2021; Yahya et al, 2025). Structural barriers and the need for institutional training methods were first identified by previous studies but recent observations indicate that staff capability issues continue to prevent the adoption of new platforms and resources. The digital competence patterns identified in this research match global trends showing that academic staff demonstrates proficiency with ICT basics but lacks the sophisticated skills required for both research and teaching (Karimi & Khawaja, 2025; Tondeur et al., 2023). The research adds local evidence to identify critical competences that need urgent attention which makes the study applicable beyond one university thus allowing other Libyan institutions and HEIs across MENA with similar limitations to adopt the framework using their own diagnostic information and governance systems. Training programs without policy alignment will face challenges in achieving long-term sustainability.

5.4 Designing Sustainable Interventions

Three evaluation paths should be established by the university and research community to monitor their progress. The administration of a brief pre/post assessment that matches a competence framework (e.g., DigCompEdu/HeDiCom-mapped checklist and performance tasks) enables reports to show support requirements at both aggregate and faculty levels. The process of transferring this knowledge requires documenting evidence through artefacts which demonstrate practical implementation (modified assessment policies in syllabi, redesigned digital activities on course sites, supervisor statements about plagiarism check regularity). Monitoring staff and student outcomes through tracking proximate indicators (decreased plagiarism cases and enhanced referencing quality in assignments and enhanced journal submission rates) together with feasible outcome collection (course completion rates and satisfaction measurements) provides evidence of progress. A modest contribution analysis can link the capacity-building program to observed improvements despite minimal causal evidence.

A strategic pivot towards a structured capacity-building program is necessary because it combines (i) sequenced practice-based training for priority competences (ii) faculty-level coordination (iii) enabling infrastructure and policy alignment and (iv) routine evaluation against recognized competence frameworks. The approach transforms digital training from remedial activities into a quality improvement strategy which produces measurable advantages for academic integrity alongside research productivity and student learning outcomes.

6. RECOMMENDATIONS

The research findings along with their analysis based on worldwide literature enable three practical recommendations for implementation:

- The university needs to implement a systematic training cascade that will reach all faculties with an optimal resource allocation. Two staff members from each of the 29 faculties should participate in an intensive training program which focuses on the main areas studied in this research: referencing and citation management, plagiarism detection, journal formatting and basic data analysis. These staff members would perform the role of local trainers inside their faculties by conducting tailored workshops to support their colleagues in practical application. The decentralized implementation of cascaded training methods has proven its effectiveness for scaling competences in limited resource situations as it allows adaptive training to disciplinary requirements.
- The establishment of e-learning coordinators by each faculty ensures continuous capacity building across time. The coordinators would lead the delivery of training as well as function as the main contact for digital competence implementation within teaching and research activities. These coordinators need to assist faculty members in adapting digital tools for their specific disciplines while maintaining institutional policies and establishing platforms for colleague support and expert conversations. The establishment of these roles through institutionalization enables the university to build professional development as an integral part of its operational structures which enables sustained practice communities beyond single workshops.
- The achievement of capacity building requires proper infrastructure to support its success. A centrally equipped training laboratory should be established by the university to accommodate at least 30–40 participants with modern computers and high-speed internet and interactive teaching tools such as smart boards. The establishment of this facility creates a stable educational space for workshop delivery and allows staff members to practice essential research and teaching tools while demonstrating institutional dedication to digital transformation. The implementation of faculty-level equipment investments together with internet reliability improvements remains essential for staff members to use their new skills effectively in their everyday work.

The institution would transition to a structured professional development model through the implementation of these measures. The cascade system allows scalability and faculty coordinators maintain sustainability while infrastructure creates the base for delivering training programs. These recommendations serve more than one institution because they provide a model which can be adjusted across Libyan higher education institutions and similar developing educational systems. These recommendations would solve the current training problems described in this study while bringing staff development into compliance with international standards like DigCompEdu and HeDiCom. Libyan universities that integrate digital competence into their core operations will build stronger research ethics while delivering superior teaching methods which produce better student educational outcomes.

7. CONCLUSION

The research investigated digital training requirements of University of Zawia faculty members through survey responses from 534 staff members across 29 faculties. The research shows that staff members demonstrated strong skills in basic software applications but lacked advanced digital abilities such as reference management and statistical analysis and manuscript preparation and plagiarism detection. The existing knowledge gaps between staff members impair research integrity and digital pedagogy implementation thus demonstrating the need for immediate professional development.

Staff members showed awareness about these deficiencies through their open-ended responses while expressing their desire for mandatory training programs. Professional development programs would meet active participant interest if they become institutionally backed and both accessible and structured in their design. The research supports global standards such as DigCompEdu and HeDiCom because it demonstrates how institutions should progress from basic digital literacy to complete digital teaching and research practice.

The research supports existing evidence showing that Libyan higher education institutions together with their regional counterparts must incorporate capacity building into institutional systems for successful implementation. The research provides an evidence-based foundation to create enduring training programs through its identification of current needs and staff priorities. The study's findings about Libyan universities apply to other Libyan educational institutions as well as developing higher education systems with similar characteristics. Digital competence implementation represents a strategic educational priority which determines both academic quality and student achievement success.

REFERENCES

Abdulsalam, A. (2020). *The level of lecturers' competency of utilization computer technology in Libya: an example faculty of education in Misurata University*. Unpublished MSc thesis, Eastern Mediterranean University, Cyprus

Ahmed, A., Geepalla, E., & Masoud, R. (2025**).** *Challenges and Opportunities of E-Learning for Libyan Universities: A Case Study of Wadi Alshatti University*. Wadi Alshatti University Journal of Pure and Applied Sciences, 3(1), 1–5.

Altbach, P. G., & de Wit, H. (2018). *The challenge of capacity building in higher education*. International Higher Education, (95), 2–3.

Bates, A. W. (2019). *Teaching in a digital age: Guidelines for designing teaching and learning* (2nd ed.). Tony Bates

Associates. https://pressbooks.bccampus.ca/teachinginadigitalagev2/

Dang, T. (2024). Digital competence and student learning outcomes in higher education. *Heliyon*, *10*(7), e23742

Fernández-Batanero, J. M., Román-Graván, P., Montenegro-Rueda, M., & Fernández-Cerero, J. (2021). Impact of ICT training on teaching and learning conditions of higher education teachers. *Education and Information Technologies, 26*(4), 4243–4260.

Ghawail, S., Elhouni, A., & Aboughofa, A. (2021). Challenges of e-learning in Libyan universities: A case study. *arXiv preprint* arXiv:2102.08545. https://arxiv.org/abs/2102.08545

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice*, *8*(3), 381–391.

ISTE (2017). *ISTE Standards for Educators.* International Society for Technology in Education.

Karimi, H. & Khawaja, S. (2025). Exploring digital competence among higher education teachers: A systematic review. *International Journal of Learning, Teaching and Educational Research* 24 (1), 100288.

Ličen, N. (2024). Designing a digital competence scale for university teachers (DCS-UT). *Sustainability*, *16*(22), 9937

Nasef, A., Alrabti, A. A., & Abdljalell, A. (2024). Readiness of Medical Libyan Establishments for the Digital Era: A Pre-requisite for Quality Assurance and Accreditation. *Annals of Bone Marrow Research*, 9(1), 001–007.

Redecker, C. (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*. Publications Office of the European Union.

Rhema, A., & Miliszewska, I. (2010). Towards e-learning in higher education in Libya. *Issues in Informing Science and Information Technology*, *7*, 423–437

Tondeur, J., Aesaert, K., Pynoo, B., van Braak, J., Fraeyman, N., & Erstad, O. (2019). Developing a validated instrument to measure preservice teachers' ICT competences: Meeting the demands of the 21st century. *British Journal of Educational Technology*, *50*(2), 639–654.

Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2023). Toward a framework for higher education teachers' digital competence: The HeDiCom framework. *Education and Information Technologies*, *28*(3), 3105–3125.

Trujillo-Juárez, D., García-Peñalvo, F. J., & García-Holgado, A. (2025). Effectiveness of micro-courses for digital competence in higher education: A systematic review. *Education and Information Technologies*, *30*(1), 123–145.

UNESCO. (2018). *Capacity building in higher education: Policy and practice*. Paris: UNESCO Publishing.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.

Yahya, M., Abdalhafid, H., & Fathi, S. (2025). Development of digital education in Libya: Progress, challenges, and future directions. *Research in Comparative and International Education*, *20*(1), 78–94.

Zaptia, S. (2024) EU4Skills project kicks off to boost jobs and close the skills gap in Libya. *Libya Herald.* Retrieved from: rom https://libyaherald.com/2024/08/eu4skills-project-kicks-off-to-boost-jobs-and-close-the-skills-gap-in-libya