From Motivation to Mastery: Lessons from Exemplar Lecturers Upgrading ICT Skills through Professional Development in Ghana

ABSTRACT

This study employed a hermeneutic phenomenology design to understand how exemplar university lecturers upgrading their Information and Communication Technology (ICT) integration skills through professional development (PD). The research focused on lecturers in a teacher education university in Ghana. Twenty (20) exemplar lecturers were purposefully selected from a target population of teacher education lecturers using snowball sampling. Data was collected through interviews which were subsequently analysed using thematic coding. The study revealed that intrinsic motivating factors for integration included the desire to work smart, personal interest, a drive for innovation, the motivation to help colleagues and students, and a commitment to lifelong learning. Factors fostering professional development included family support, a strong affinity for Mathematics and Science, the pursuit of a professional niche, and institutional elements such as support services and equipment availability. However, the study identified significant factors hindering professional development for ICT integration: Lack of adequate funding for specialized training or conference attendance, and insufficient "book and research" allowances to acquire necessary resources; Limited and generalized professional development programmes that failed to meet specific or advanced needs of lecturers across diverse subject areas; Inadequate technical support, characterized by a low number of ICT experts resulting in slow response times, and a lack of pedagogical context in their technical instructions; Lack of institutional competency requirements for technology integration, leading to a relaxed attitude among many lecturers as there is no formal pressure for skill development or promotion based on ICT proficiency. The study concluded that institutional facilities and policies are currently inadequate to support comprehensive technology integration. It recommended that the Government of Ghana and university management provide necessary ICT resources and funding for professional development, establish technology integration as a key requirement for lecturer appointments and promotions, increase the number of well-equipped ICT support staff, and implement needs-based, tailored PD programmes. This holistic approach, including encouraging exemplars to mentor colleagues, is deemed crucial for fostering widespread and effective technology integration across Ghanaian universities. KEYWORDS: Information

and Communication Technology (ICT) Integration; Professional Development (PD); University Lecturers; Exemplar Lecturers; Intrinsic Motivation; Institutional Barriers.

1. INTRODUCTION

The contemporary educational landscape is undergoing a profound transformation driven by the rapid advancement of Information and Communication Technology (ICT). This global shift necessitates that higher education institutions embrace digital modalities, developing essential 21st-century skills such as knowledge management, innovation, and digital literacy. As digitalization accelerates across Sub-Saharan Africa, pressures related to inclusivity and digital equity increasingly motivate universities to adopt ICT to ensure students are competitive in the global knowledge economy (Amankwah-Amoah, & Debrah, 2023).

In this evolving space, university lecturers must serve as adaptors, researchers, and technocrats, with their professional competence directly influencing educational outcomes. However, the successful and sustainable integration of ICT into teaching and learning remains a significant challenge, particularly in developing contexts where infrastructural and institutional constraints prevail (World Bank, 2023).

In Ghana, many lecturers, especially within Teacher Education Universities (TEUs), lack the requisite advanced skills for effective ICT integration, stalling progress at basic levels rather than reaching the transformative stages of technological use. This challenge is compounded by a historical lack of dedicated, continuous professional development (PD) activities and insufficient resource provision. The limited PD offered often focuses narrowly on basic learning management systems (e.g., MOODLE), which lecturers frequently struggle to integrate effectively into their pedagogy. This reliance on individual discretion for skill development, coupled with systemic weaknesses, create multiple significant barriers.

Specifically, professional development for ICT integration among Ghanaian lecturers is heavily obstructed by critical institutional bottlenecks. These hindrances include: lack of adequate funding for specialized training, conferences, and the acquisition of necessary technological resources; limited and generalized PD programmes, which are often "one-size-

fits-all" and fail to address the diverse, subject-specific, and advanced needs of lecturers; inadequate technical support, characterized by a low number of ICT experts leading to slow response times and a critical lack of pedagogical context in technical guidance; and absence of clear institutional competency requirements for technology integration, meaning skill development is not formally linked to hiring, promotion, or career advancement, thereby relaxing institutional pressure for adoption.

In response to these systemic gaps, this study sought to understand how a cadre of exemplar lecturers—individuals who have gone the "extra mile" through self-directed learning and intrinsic motivation—have proactively upgraded their ICT integration skills. By focusing on the lived experiences of these high-integrators, the research aims to identify practical lessons that can inform and promote effective, equitable, and widespread professional development across Ghanaian universities. This understanding is crucial for moving beyond fragmented adoption and ensuring that technology integration becomes a systematic, central element of 21st-century teacher education in Ghana.

2. LITERATURE REVIEW

Globally, ICT integration is driven by both intrinsic and extrinsic motivators. Intrinsic factors often centre on efficiency, opportunities for innovation, and the professional satisfaction gained from creating interactive teaching experiences (Ahmad et al., 2024; Ghavifekr & Rosdy, 2015). The Technology Acceptance Model (TAM) emphasizes “perceived usefulness” as a critical determinant, frequently linked to extrinsic rewards like improved efficiency and institutional support (Tondeur et al., 2022). Furthermore, lecturers’ pedagogical beliefs—whether technology is viewed merely as an efficiency tool or as a mechanism for transformative learning—significantly shape the depth of their motivation (Heitink et al., 2024).

In Sub-Saharan Africa, motivation is conditioned by local realities, including the imperative to remain professionally relevant amid rapid digitalization (Adeoye et al., 2024). African lecturers are driven by a desire to leverage ICT to expand access, diversify assessment, and streamline administrative tasks in resource-constrained environments (World Bank, 2023). Professional learning communities (PLCs) in countries like Uganda and Ghana have been shown to foster integration by promoting peer collaboration and shared problem-solving, reinforcing motivation through network recognition (Kaliisa et al., 2022). Within Ghana,

intrinsic motivators such as the desire to “work smart,” pursue innovation, and commit to lifelong learning are consistently reported as key drivers (Ansah, 2019, 2025; Owusu-Fordjour et al., 2023). Recent evidence highlights younger lecturers’ increasing adoption of artificial intelligence applications, driven by curiosity and the need for innovative pedagogical shifts (Armah, & Boateng, 2023). Extrinsic motivation is tied to the societal expectation that lecturers prepare students for employability and competitiveness in the global labour market (Amankwah-Amoah, & Debrah, 2023).

Fostering factors for ICT professional development encompass both personal resilience and institutional support. Personally, lecturers' self-efficacy and competence in ICT use strongly predict their engagement in further professional development (Heitink et al., 2024; Tondeur et al., 2022). Institutionally, effective development requires structured, hands-on, contextualized, and continuous training, rather than isolated workshops (Ghavifekr, & Rosdy, 2015). Global best practices, such as those advocated by the U.S. Department of Education (2017) and UNESCO (2024), recommend aligning institutional practices—including recruitment and promotion—with formal ICT competency standards to create extrinsic incentives for continuous PD (Education, U. S. D. of, 2017; UNESCO, 2024).

In the African context, fostering factors include context-sensitive training that addresses specific disciplinary needs and infrastructure constraints (Adeoye et al., 2024). The availability of functioning ICT infrastructure, such as labs and reliable connectivity, creates the necessary foundation for lecturers to experiment and develop new skills (World Bank, 2023). Furthermore, national digitalization policies push universities to introduce training schemes and subsidize resources, aligning individual effort with broader agenda (Amankwah-Amoah, & Debrah, 2023).

In Ghana, the reliance on self-directed learning and peer mentoring, particularly among exemplar lecturers, demonstrates that personal drive often compensates for the lack of comprehensive institutional programmes (Ansah, 2019). Family support also emerges as an important enabler, with lecturers receiving assistance in troubleshooting and content creation from relatives (Ansah, 2025). Institutional supports, though limited, include periodic foundational training in platforms like MOODLE and the Online Student Information System (OSIS), and the availability of specialized units such as the African Virtual University (AVU) centre for accessing resources (Owusu-Fordjour et al., 2023).

Persistent financial barriers globally limit access to specialized ICT training and technology acquisition (Mkpa, & Ekoh-Nweke, 2019). A major global hindrance is the generic and "one-off" nature of many PD programmes, which overlook disciplinary differences and neglect the critical connection between technology and pedagogy (Ghavifekr, & Rosdy, 2015; Tondeur et al., 2022). Similarly, poor infrastructure, including unreliable internet and outdated hardware, restricts the ability of lecturers to practice new skills (UNESCO, 2024). Finally, the absence of academic acknowledgment—such as linking ICT competence to appraisal or promotion—reduces the extrinsic motivation for faculty to prioritize technology development (Spotts, 1999). In Africa, infrastructural challenges are more acute, with chronic problems like unreliable electricity and unstable internet directly restricting professional development opportunities (World Bank, 2023). Even where infrastructure exists, the lack of skilled ICT support staff undermines the sustainability of technology-enhanced teaching (Agyei, 2013).

Traditional, teacher-centred pedagogies also persist, and the absence of strong enforcement mechanisms for formal ICT policies undermines accountability and incentive structures (Chisango, & Marongwe, 2018; Salehi, & Salehi, 2012). In Ghana, these hindrances manifest in the insufficient “book and research allowance” to fund advanced training or technological tools (Ansah, 2019; Owusu-Fordjour et al., 2023). Institutional PD programmes are frequently basic and "one-size-fits-all," failing to meet advanced or discipline-specific needs (Ansah, 2025). Technical support is often inadequate in quantity and quality; for example, a minimal number of ICT staff serves large faculty populations, leading to delays and limited pedagogical guidance (Ansah, 2019). Most critically, the lack of a clear-cut institutional competency requirement means there is no formal pressure tied to career advancement, allowing many lecturers to remain indifferent to skill development (Ansah, 2019).

3. Research questions

1. What are the factors that motivated the exemplar lecturers to integrate ICT?

2. What factors foster professional development for ICT integration in teaching and learning among exemplar university lecturers in Ghana?

3. What factors hinder professional development for ICT integration in teaching and learning among exemplar university lecturers in Ghana?

3. METHODOLOGY

3.1. Research design

The research design for this study was hermeneutic phenomenology. This approach falls under the broader qualitative research paradigm. This specific design was chosen because it allows the researchers to acquire the stories that were conveyed by the lecturers; to focus on researcher dialogue and interpretation of participants' reported experiences; to explore the lived experiences of exemplar lecturers in relation to the ICT integration phenomenon; and to interpret the experiences of the research participants as they describe their lived experiences. Through this qualitative methodology, rigorous interviews were conducted using an interview guide to gather data, enabling the researchers to understand participants' experiences, views, and perspectives on ICT integration in education.

3.2. Population and sampling

The study identified two levels of population. The broader population consisted of all 452 lecturers actively serving (60 years and below) in a state-owned teacher education university (TEU) in Ghana. These lecturers were responsible for teaching, researching, and community service across various subject areas. For the specific focus of this study, the population was narrowed down to 327 lecturers who were directly involved in teacher education. This means they taught pedagogical knowledge, content knowledge, technological knowledge, or a combination of these areas. The study's sample comprised 20 exemplar lecturers. These individuals were specifically chosen because they had upgraded themselves to higher levels of ICT integration in teaching, serving as models for their colleagues. All 20 participants were drawn from all the education (Both subject matter and pedagogy teaching departments) related Departments within the sampled university.

The selection of these 20 exemplar lecturers involved a deliberate two-step sampling process. Purposive Sampling method was initially employed to identify one exemplar lecturer who was already integrating technology at the "infusing stage" (Anderson, 2010, p32). Purposive sampling was deemed optimal because it ensured that the initial participant had direct experience with the phenomenon being studied, which is crucial for qualitative research aiming for in-depth insights. Then Snowball Sampling method was employed to identify

participants. The initially identified exemplar then recommended other lecturers known for their significant technology integration in teaching.

This method was considered appropriate due to its ability to effectively link the researchers with lecturers who shared specific characteristics and experiences related to professional development in technology integration. While acknowledging that this method might lead to recruiting participants with existing relationships, such as friendships, the study emphasized that it allowed the researchers to gain valuable insights into the experiences of the recruited participants and the reasons for their nomination.

3.3. Data Collection Instruments

Data collection instruments employed for the study was primarily interview guide. A semi-structured questionnaire was designed by the researchers and was used for data triangulation. It was administered to exemplar participants prior to the interviews to enable researchers ensure concentration of themes. Originally, three main themes informed the item construction for the questionnaire, and all three were retained for the study.

Further, the interview guide was used for one-on-one in-depth interviews. They aimed to gather qualitative data to ascertain participants' experiences, views, and perspectives on ICT integration in education, focusing on their lived experiences. The interviews allowed the researchers to delve into participants' experiences, views, and perspectives on areas such as ICT integration, competencies, skills, motivating factors, and hindrances at the selected university. Initially, three main items were constructed for the interview guide, with one more item added later, making a total of four main items. Each item had various sub-items, depending on the flow of the interview. The interviews were conducted under serene conditions, and participants were given the opportunity to read their transcribed data. Data was captured using note-taking (paper and pen) and audio recording. A digital voice recorder served as the primary recording device, with a smartphone as a backup. Each interview was transcribed by a professional transcriptionist who signed a confidentiality agreement.

The data collected from the questionnaire were analysed using percentages to report on exemplars' technology integration in lessons. The questionnaire was pre-tested with two exemplars from the Faculty of Education of a similar university in Ghana to ensure clarity and relevance.

3.4. Data collection procedure

The data collection procedure was meticulous and primarily involved two main instruments: a semi-structured questionnaire and an interview guide. The process was carefully structured to gather rich, qualitative data while maintaining ethical standards. Before commencing data collection, Ethical Review Committee (ERC) approval was obtained. The researchers also made conscious efforts to ensure trustworthiness, authenticity, and validity throughout the process. The researchers initiated contacts with potential participants by making a series of phone calls to book appointments for the interviews. Prior to any data collection, participants were provided with letters of consent and participation. They received written instructions and notifications regarding their voluntary participation and their right to refuse or withdraw at any time. Each participant was asked to sign an Informed Consent form before interviews commenced.

The semi-structured questionnaire was administered to lecturer participants prior to the interviews. The one-on-one in-depth interviews were conducted with the exemplar lecturers in line with the interview guide. Each recorded interview was transcribed by the researchers. Subsequently, the transcribed data for each interviewee was provided to them for review and confirmation of their expressed opinions. Audio data was handled with utmost care to prevent unauthorized access. Digital recordings were stored in a cloud folder accessible only to the researchers. Participants' identities were protected by using pseudo-names in the final report.

3.5. Data analysis

Data analysis procedure was systematic, drawing on qualitative techniques to provide a comprehensive understanding of the phenomenon. Transcribed qualitative data were exported into NVivo 12. The analysis of textual data followed Creswell's (1994) systematic process. This involved multiple stages of coding (such as Thematic Coding, Attribute Coding and Structural Coding) to organize the data based on the research questions. Further, Pattern Coding was employed to identify emergent themes or explanations that cut across categories. Finally, data were interpreted, and meaning was drawn from both single instances and aggregated themes. The overall meaning of the study emerged from this comprehensive collection of stories, instances, and themes. The process resulted in the identification of three main themes and various sub-themes, directly addressing the three research questions. For example, research question one (motivating factors) involved themes like working smart, personal interest, innovation, helping colleagues and students, and lifelong learning. Research

question two (fostering factors) covered family support, love for mathematics and science, creating professional niche, support services, and ICT facilities. Research question three (hindering factors) identified lack of fund, limited professional development programmes, inadequate technical support, and lack of institutional competency requirement.

3.6. Ethical considerations

Ethical considerations were rigorously observed throughout the data collection and analysis phases. Ethical Review Committee (ERC) approval was obtained before commencing the research. This ensured that the study's methodology and procedures conformed to ethical guidelines. Prior to data collection, participants were provided with letters of consent and participation. They received written instructions and notifications explicitly stating their voluntary participation and their right to refuse or withdraw at any time without penalty. Each participant was required to sign an Informed Consent form before interviews began, confirming their understanding and agreement to participate. The consent form detailed the study's purpose, benefits, and ensured no personal information would be collected to identify them. Participants' identities were protected throughout the study by using pseudo-names (decoy names) in the final report to conceal their identities.

A confidentiality agreement was signed by the professional transcriptionist who handled the interview data. This agreement stipulated that no recorded or transcribed data would be shared with anyone other than the researchers. Audio data was handled with utmost care to prevent unauthorized access. Digital recordings were stored in a cloud folder accessible only to the transcriptionist and researchers, and then deleted from the cloud once transcripts were returned. All audio and transcribed files were kept under lock to maintain privacy, anonymity, and confidentiality before, during, and beyond the study.

The researchers made conscious efforts to protect participants by anticipating possible dangers involved in real-life audio recording and the in-depth nature of the data collected, which could potentially compromise their legal and professional standards. Measures were taken to avoid exposing participants to any form of danger. The presentation of the research and its findings maintained the lecturers' privacy as much as possible.

Participants were given the opportunity to read their transcribed data to review and confirm their expressed opinions. Feedback on insights from the analysis was provided, taking into

account the participants' perspectives, expectations, and feelings. These protocols ensured the ethical integrity of the study, aligning with principles of voluntary participation, informed consent, confidentiality, and respect for participants' rights and well-being.

4. RESULTS

4.1. Factors that motivated the lecturers to integrate ICT

The study found that the factors motivating lecturers to integrate Information and Communication Technologies (ICT) were primarily intrinsic, stemming from the inherent importance they attached to technology for their personal and professional growth. These motivating factors included: Working smart, Personal interest, Innovation, Helping Colleagues and Students, and Lifelong Learning.

4.1.1. Working Smart

Many lecturers (70%) were motivated by the desire to find easier and more efficient ways to perform their routine academic duties, such as lesson preparation, student interaction, assessment, and research. They found that ICT simplified tasks like editing, saving, and sharing digital content. Lecturers believed harnessing ICT's advantages would make their professional lives easier.

4.1.2. Personal interest

A high number of lecturers (90%) were driven by a genuine love for ICT and its integration, finding personal satisfaction in using modern devices and technologies in their profession. They were interested in adopting the latest technologies to remain relevant in the digital age, recognizing that the 21st century is heavily influenced by the digital era.

4.1.3. Innovation

A significant portion (65%) felt the need to adopt new and different ways of teaching, moving away from traditional methods to pursue more efficient information searching, lesson delivery, assessment, and student interaction. Younger lecturers, in particular, sought innovative ways of performing duties, recognizing that times have changed and students need modern approaches.

4.1.4. Helping colleagues and students

About half (50%) of the lecturers were motivated by the desire to assist peers with technology integration and to address the needs of students with disabilities by providing accessible instructional materials. Some exemplars enjoyed being perceived as "tech-icons" and providing coaching and troubleshooting assistance to other lecturers. They also found fulfilment in reaching out to hearing-impaired and visually-impaired students through audio-visual materials.

4.1.5. Lifelong learning

A notable percentage (40%) were eager to continuously learn and stay abreast of evolving research, new ideas, and knowledge. They recognized the necessity of integrating technology for efficient data retrieval, processing, and knowledge dissemination, which also aided their pursuit of promotions through research and publications.

4.2. Factors that foster professional development for ICT integration in teaching and learning among

The study identified both personal and institutional factors that fostered professional development for ICT integration among exemplary lecturers. The personal factors included family support, love for mathematics and science, and creating a professional niche. The institutional factors on the other hand, included support services and ICT facilities.

4.2.1. Family support

Participants indicated that help from relatives, including children, spouses, and siblings, served as a major factor fostering professional development for some exemplars, particularly in areas like instructional media production and troubleshooting. About half of the knowledge and skills for technology integration were believed to be acquired through family assistance.

4.2.2. Love for mathematics and science

Some exemplars with strong mathematics and science backgrounds found that this facilitated their professional development in ICT integration. They believed their interest in sciences made learning science-related knowledge and skills, including ICT, easier for them, often leading them to apply ICTs to solve educational problems.

4.2.3. Creating a professional niche

The desire to be outstanding and consistently relevant as lecturers motivated some to pursue professional development in ICT integration. They viewed ICT integration as an emerging area to specialize in, believing it would prevent them from becoming "obsolete" in the future.

4.2.4. Support services

The university provided periodic ICT training programmes covering Microsoft Applications, the Online Student Information System (OSIS) for assessment records, and MOODLE. While these programmes were general, they brought lecturers together for discussions and practice. Technical support staff were available to assist with troubleshooting, application installation, and one-on-one coaching, which was preferred by many lecturers for its flexibility.

4.2.5. ICT facilities

The availability of various ICT facilities, including software (OSIS, MOODLE, Microsoft Applications, specialized math/Braille packages, online library services, Internet) and hardware (laptops, projectors, printers, PA systems, digitalized boards) provided avenues for professional development. Dedicated units like the African Virtual University (AVU) and the Educational Resource Centre (ERC), along with departmental ICT labs, also offered specialized resources and support for ICT experimentation and knowledge propagation.

4.3. Factors that hinder professional development for ICT integration in teaching and learning among

The study identified several factors that hindered lecturers' professional development for ICT integration. The factors identified were: lack of funds, limited professional development programmes, inadequate technical support, and lack of institutional competency requirement.

4.3.1. Lack of funds

Lecturers faced limitations in obtaining funding for specialized training, such as multimedia instructional production or advanced graphic design courses, and for attending international conferences on technology integration. They were reluctant to use personal funds, as technology integration was not considered their main field of study, and university management often did not sponsor training outside their specific domain. Additionally, the "Online Teaching Support Allowance" (which is to augment the “Book and Research Allowance”) was deemed insufficient for acquiring necessary technological services.

4.3.2. Mismatch professional development programmes

Institutional professional development programmes were found to be not comprehensive enough and generally basic, focusing on common applications rather than addressing the diverse, subject-specific, and advanced technological needs of lecturers from different departments. This "one-size-fits-all" approach often failed to engage lecturers who desired more tailored training, sometimes even deterring them from participating.

4.3.3. Inadequate technical support

While technical support was available, it was deemed insufficient in both quality and quantity. A small team of four experts served the entire university, leading to delays in response times for technical assistance and hindering lecturers' learning processes. The content of technical support also lacked pedagogical considerations.

4.3.4. Lack of institutional competency requirement

The absence of a clear-cut technology integration competency requirement for hiring or promotion meant that lecturers were not under institutional pressure to develop their ICT integration skills. This lack of a "yardstick" for measuring integration led many lecturers to be relaxed about acquiring these competencies, as it was not linked to job security or career advancement.

5. DISCUSSION OF RESULTS

The findings of this study, focusing on the lived experiences of exemplar lecturers in a Ghanaian Teacher Education University, provide critical insights into the factors that drive, foster, and hinder advanced ICT integration skills development. The results reinforce established global themes while underscoring the acute challenges presented by institutional inertia and resource constraints in the Sub-Saharan African context.

The study established that intrinsic motivators were the primary drivers for exemplar lecturers to proactively pursue ICT integration. Key motivations identified were the desire to achieve professional efficiency ("working smart"), genuine personal interest in technology, the pursuit of innovation, and a deep commitment to lifelong learning. These findings align strongly with global literature which positions intrinsic factors, such as professional satisfaction, opportunities for creative instruction, and self-improvement as central to technology adoption (Ahmad et al., 2024; Ghavifekr & Rosdy, 2015). The drive for efficiency directly reflects the concept of "perceived usefulness" emphasized by the Technology Acceptance Model (TAM) literature (Tondeur et al., 2022). Within the Ghanaian

context, this emphasis on intrinsic drive, innovation, and self-efficacy is consistently reported as a mechanism used by lecturers to manage the demands of digitalization and remain professionally relevant (Ansah, 2019, 2025; Owusu-Fordjour et al., 2023). Additionally, the finding that lecturers are motivated by a desire to help colleagues and students echoes regional insights that professional learning communities and peer support systems are powerful catalysts for ICT adoption in Africa (Kaliisa et al., 2022). This demonstrates that the exemplar lecturers' motivation is not purely self-serving but is also driven by a collective professional responsibility, contrasting with studies that focus on poor attitudes as a primary barrier.

The fostering factors for ICT professional development were a blend of personal resilience and minimal institutional supports. Personally, the desire to create a professional niche to remain relevant, combined with background factors such as an affinity for Mathematics and Science, acted as powerful internal enablers. This self-set goal-orientation is consistent with literature highlighting the critical role of self-efficacy and individual competence in predicting engagement in further PD (Heitink et al., 2024; Tondeur et al., 2022). The strategic pursuit of niche skills also reflects trends observed in Ghana, where lecturers seek to distinguish themselves through digital mastery and avoid "obsolescence" (Armah & Boateng, 2023; Owusu-Fordjour et al., 2023).

Institutional supports, while limited, played a foundational role. The availability of basic ICT facilities (e.g., MOODLE, OSIS, AVU centre) and the provision of technical staff for one-on-one coaching underscore the importance of institutional infrastructure in creating a practice environment (World Bank, 2023). However, the study's data confirms that these supports are *insufficient*. The reliance of exemplar lecturers on family support for tasks like instructional media production, a unique finding previously highlighted in the Ghanaian context (Ansah, 2025), clearly indicates that the formal institutional mechanisms are inadequate, forcing high-performing lecturers to rely on informal, external networks to bridge skill gaps.

The most significant findings of the study reveal systemic institutional bottlenecks that actively hinder widespread and equitable ICT integration. These obstacles validate and compound many challenges identified in global and regional literature:

1. Financial Constraints and Funding: The lack of adequate funding for specialized training, coupled with the insufficiency of the "book and research" allowance for procuring necessary technological devices, is a major hindrance. This mirrors the global challenge that lecturers

prefer sponsored professional development (Mkpa & Ekoh-Nweke, 2019) and confirms the specific financial hurdles reported in the Ghanaian context (Ansah, 2019; Owusu-Fordjour et al., 2023).

2. Limited and Generic PD Programmes: Institutional PD programmes were found to be "one-size-fits-all," failing to provide the diverse, advanced, and subject-specific content needed by different faculties. This problem is a pervasive barrier documented globally, where generic, "one-off" training fails to connect technology use with pedagogical needs (Ghavifekr & Rosdy, 2015; Tondeur et al., 2022). The limited scope of training in Ghana leaves many disengaged, resulting in fragmented implementation.

3. Inadequate Technical Support: While support exists, the study found it lacking in both quantity (e.g., a small number of staff for the entire university) and quality (lacking pedagogical context). This deficit strongly reinforces prior African studies which identified the shortage of skilled human resources as a key inhibitor of sustained technology use (Agyei, 2013), and highlights the necessity of providing support that is pedagogically informed, not just technical.

4. Lack of Institutional Competency Requirements: Most critically, the absence of a clear-cut competency requirement for ICT integration in hiring, appraisal, or promotion was identified as a major factor allowing non-integrating lecturers to remain indifferent. This lack of extrinsic incentive removes institutional pressure for skill development. This outcome starkly contrasts with international best practices advocated by bodies like the U.S. Department of Education (2017) and the AECT Standards (2012), which recommend formalizing ICT competencies to drive adoption. It further confirms the lack of strong enforcement mechanisms in many African institutions, undermining accountability (Chisango & Marongwe, 2018; Amankwah-Amoah & Debrah, 2023).

5. Broader Infrastructural Challenges: The study’s results confirming issues such as inconsistent electricity supply and unstable internet connectivity are consistent with the acute infrastructural challenges reported across Sub-Saharan Africa (World Bank, 2023). The discussion demonstrates that while exemplar lecturers possess high intrinsic motivation and resilience, institutional structural gaps prevent widespread technology integration. Without formal incentives (like promotion criteria) and tailored support (funding, specialized PD), reliance on individual effort will continue, limiting ICT integration to a dedicated few, which recommend formalizing ICT competencies to drive adoption. It further confirms the lack of

strong enforcement mechanisms in many African institutions, undermining accountability (Chisango, & Marongwe, 2018; Amankwah-Amoah, & Debrah, 2023).

6. CONCLUSIONS

The study emphasizes the current state and necessary future directions for Information and Communication Technology (ICT) integration and professional development among university lecturers in Ghana. The study concludes that technology integration is a useful and increasingly vital phenomenon in the professional lives of university lecturers in Ghana. Exemplar lecturers already employed ICTs extensively in instructional material preparation, student interaction, and assessment, which significantly boosts their efficiency. Lecturers' acquisition of ICT competencies is largely self-driven. Exemplars primarily upgrade their skills through self-tutoring (knowledge expedition), peer learning from colleagues, and engagement with online materials, with minimal structured input from the university. This self-directed approach highlights a strong commitment to continuous professional growth.

Motivation for ICT integration is predominantly intrinsic. Lecturers are motivated by a desire to "work smart" (achieve efficiency), personal interest in ICT, a drive for innovation, the satisfaction of helping colleagues and students, and a commitment to lifelong learning. This deep-seated motivation suggests that lecturers inherently value technology for their personal and professional advancement. Professional development is fostered by a combination of personal and limited institutional factors.

Significant institutional bottlenecks hinder widespread ICT integration and professional development. Lack of adequate funding for specialized training and procurement of necessary ICT facilities is a major barrier. Professional development programmes are often limited, generic, and fail to address the specific and advanced needs of lecturers across different disciplines. Technical support is inadequate in terms of both quantity of staff and the quality of pedagogical guidance. The absence of clear institutional competency requirements for ICT integration means there is no formal pressure or incentive linked to career advancement (appointment or promotion) to encourage broader adoption among lecturers. In essence, while a cadre of exemplary lecturers demonstrates the benefits of ICT integration through self-driven development and intrinsic motivation, systemic institutional gaps in funding, tailored professional development, robust technical support, and formalized competency standards significantly impede broader, equitable, and effective technology integration across

Ghanaian teacher education universities. The study concludes that for technology integration to be a central and effective part of 21st-century teacher education, these institutional drawbacks must be proactively addressed.

7. RECOMMENDATIONS

In order to enhance ICT integration, the studies recommends professional development for lecturers. We recommend that the Government of Ghana, through its Ministries of Finance and Education, should provide necessary support for the procurement of ICT facilities for educational purposes. This support could include free supply of facilities, subsidized excise duty, and reduced prices for equipment to encourage lecturers to acquire and integrate them. Exemplary lecturers should actively assist and coach non-integrating colleagues to encourage broader adoption of ICTs for instructional and administrative purposes. This leverages the existing expertise within the universities.

It is recommended that the Ghana Tertiary Education Council and university administrators should set a higher standard of technology integration as a key requirement for the appointment of new lecturers. For existing lecturers, technology integration should become a formal criterion for promotion to senior lecturer and professor. This would provide a formal incentive and pressure for skill development.

The management of Teacher Education Universities (TEUs) should allocate funds for lecturers to attend conferences and workshops specifically aimed at enhancing their use of ICT in teaching. The TEUs should employ more well-equipped ICT staff to provide sufficient and high-quality technical support services to lecturers. This addresses the current inadequacy of technical support. The human resource units of TEUs should develop and implement comprehensive ICT integration professional development programmes that are designed to address the specific needs of all lecturers. This moves beyond generic training to more targeted and effective programmes.

Researchers in Ghana should develop a greater interest in studying lecturers' technology integration within the Ghanaian context. This would help establish best practices and contribute to existing knowledge on ICT integration outcomes. Curriculum development at the TEU level should explicitly integrate technology, ensuring that all lecturers are aligned with and encouraged to adopt ICT in their teaching practices.

8. LIMITATION OF THE STUDY

This study focused on understanding how exemplary lecturers in Ghana upgraded their Information and Communication Technology (ICT) integration skills through professional development. The limitations noted for this study include limited generalizability. The study was purely on exemplars' experiences in technology integration and challenges, meaning it did not study in general, lecturers' ICT integration and therefore cannot be generalized to all lecturers in the study area. Despite this, the findings were deemed significant, valid, and useful for specific areas like competency acquisition and institutional challenge resolution in Ghanaian teacher education. Further, there was data collection prolongation as some initially sampled exemplars frequently rescheduled or eventually declined participation, which prolonged the data collection period as the researchers had to spend more time following up and selecting new participants.

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