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Exploring University Initiatives to Enhance Teachers' ICT Competencies in Nepal: A Qualitative Analysis

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Abstract

This paper explores a qualitative analysis of the university initiatives aimed at enhancing teachers' information and communication technologies (ICT) competencies in Nepal. ICT encompasses various communication devices and applications such as radio, television, cellular phones, computers, and satellite systems. University initiatives are structured programs and activities that integrate ICT into the educational landscape to improve teachers' competencies. ICT integration in education is crucial for interactive learning, but teachers often face challenges like inadequate training, resource scarcity, limited access, time constraints, and insufficient technology skills. This paper used a qualitative research method, focusing on in-depth interviews with eight economics teachers selected through purposive sampling. The research inquired about the initial feelings and changes in confidence and teaching practices after implementing ICT tools in the training. For example, teachers require continuous and context-specific professional development programs to enhance their ICT skill needs. In addition, ongoing training and infrastructure investments emphasize the necessity of current hardware and reliable internet for successful ICT integration. This paper concludes that teachers initially felt overwhelmed by the complexity of new technologies, but over time, through supportive training and peer collaboration, they gained empowerment and ownership. In this context, the universities are enhancing teachers' ICT competencies through professional development, infrastructure improvements, fostering a supportive culture, and curriculum integration.

Keywords: University initiatives, teachers' competencies, educational landscape, student engagement, learning environment.

Introduction

This paper explores a qualitative analysis of university initiatives aimed at enhancing teachers' information and communication technology (ICT) competencies in Nepal. The integration of ICT is pivotal in the rapidly evolving educational landscape, improving teaching and learning processes for efficiency, interactivity, and accessibility. ICT has significantly transformed various aspects of life, including education, and its integration in classrooms can enhance learning experiences for all ages(Kumar, 2008; Tondeur et al., 2012). ICT tools like interactive whiteboards, educational apps, and online simulations enhance student engagement, promote deeper understanding, and motivate through real-time collaboration and virtual object manipulation. ICT enables personalized learning by utilizing online platforms and adaptive software to tailor educational content to individual student strengths and weaknesses, offering targeted practice and differentiated instruction(Hanaysha et al., 2023; Mensah et al., 2023).

The majority of teachers face significant challenges in integrating ICT into their teaching practices, which can be categorized into extrinsic and intrinsic factors. Williams-Buffonge (2021)highlights that extrinsic factors such as inadequate access to technological resources, insufficient technical support, and insufficient professional development opportunities are significant challenges. Intrinsic factors include teachers' attitudes towards technology, self-efficacy in using ICT, and perceived relevance of ICT in teaching practices (Graham et al., 2020; Singhavi & Basargekar, 2019; Zhang, 2021). Universities are vital in providing teachers with the necessary ICT competencies to adapt to evolving educational paradigms as centers of learning and innovation. The successful implementation of ICT in education heavily relies on the university's initiatives for enhancing teachers' ICT skills and competencies. ICT integration in education is transforming teaching methods, improving quality, increasing student engagement, and fostering inclusive learning, catering to diverse needs (Eaton, 2020; Shoraevna et al., 2021; UNESCO, 2002)UNESCO (2002)highlights ICT's role in digital technologies like computers, laptops, TV, software, hardware, and the Internet, highlighting its application in quality education. The learning methods are designed for teachers to focus on digital age learning, student learning, professional growth, digital citizenship, and digital age work. In the 21st century, teachers are requiring innovative education methods such as virtual learning, blended learning, project-based learning, and student-centered learning(Bakar, 2021).

Tribhuvan University is the oldest and largest academic institution in Nepal. It faces various challenges in the adaptation of technological infrastructure facilities to integrate teaching and learning activities. ICT literacy and digital divides are serious problems among the university teachers. The existing literature indicated that the majority of university teachers were unprepared to integrate ICT into their teaching due to inadequate training and resources (Joshi, 2022, 2023; Kandel & Kaphle, 2021).Their findings show that teacher education programs should equip teachers with comprehensive knowledge of effective pedagogical practices, technical skills, content knowledge, and interpersonal relationships. ICT skills are important for high-quality university education, especially in economics. However, effective integration of ICT tools in economics courses requires teachers who possess adequate technological skills, as well as access to necessary hardware and internet resources for academic use.

This paper highlights the issue of inadequate ICT competencies among faculty members at Tribhuvan University in Nepal, despite the growing significance of ICT in higher education. The effectiveness of existing initiatives in enhancing teachers' ICT skills is not well understood at the Tribhuvan University in Nepal. In this context, this paper attempts to address this gap through a qualitative approach. This paper's findings are crucial for enhancing teachers' ICT competencies at Tribhuvan University, aiming to improve education quality and student readiness for the digital workforce.

Methods and Materials of the Study

This paper utilizes a qualitative research approach with in-depth interview(Qutoshi, 2018).This design aims to understand the challenges faced by economics teachers at Tribhuvan University in integrating ICT into their teaching-learning processes. Purposive sampling was employed to select eight participants with relevant experiences and insights related to the research topic. Data were collected through in-depth interviews to gather comprehensive data on the experiences and perspectives of the participants. The in-depth interview guideline was created to cover all relevant topics, with each interview lasting approximately one hour and using a semi-structured format for flexibility. The interviews were recorded using a voice recorder, transcribed, and translated into English, and the data was analyzed using thematic analysis.

The transcriptions were analyzed using qualitative research software ATLAS.ti, which was then coded to identify meaningful units of information. The codes were categorized based on semantic consistency and research questions, identifying patterns and relationships within the data.Braun and Clarke (2019)research derived themes from categories, representing broader concepts and insights, while ensuring ethical considerations were carefully observed throughout the process. Participants were informed about the study's purpose, consent was obtained, and confidentiality and anonymity were maintained to protect their identities and ensure ethical integrity.

Result and Discussion

This section is organized based on themes related to the role of university involvement in enhancing teachers' ICT skills, based on participant data. The research findings are analyzed and discussed under distinct headings, ensuring an in-depth examination of the findings and discussions, each containing multiple sub-themes.

ICT in education practices in Nepal

ICT has been utilized in Nepal for both school and university levels with legal and practice purposes, serving as a lifeline for pedagogy and learning having internet connectivity, ICT labs, and computer classes. Nepal's National Education Policy, 2076, mandates teacher training on ICT in education and digital literacy(Ministry of Education Science and Technology, 2019). The School Sector Development Plan focuses on digital materials and ICT hubs(Ministry of Education, 2016). The Information and Communication Technology Policy, 2072 envisions internet access for all citizens and schools by 2020(Ministry of Science and Technology, 2000). The Digital Nepal Framework 2076 prioritizes digital tools in education, human resources, and industry(Ministry of Communication and Information Technology, 2019). The 2077 guidelines aim to facilitate learning in physically disturbed environments, including online and blended modes, and provide provisions for teacher professional development through distance education systems, addressing the needs of rural areas.

Tribhuvan University, the oldest and largest academic institution in Nepal, has introduced Open and Distance Learning (ODL) to promote inclusivity and adaptability in education. The Institute of Education introduced an ODL program in 1976 in TU, which was discontinued in 1980 and replaced by the Radio Education Teacher Training (RETT) Project. The Distance Education Center in Nepal was established in 1994, utilizing radio for teacher training and education awareness campaigns. The Open and Distance Learning Policy 2006 aims to provide remote, job-stressed, and earning-while-learning secondary-level education to Nepali students.

Tribhuvan University established the Open and Distance Education Center (ODEC) in 2015, providing quality higher education in math and English to a diverse range of individuals in Nepal and abroad. Before COVID-19, Tribhuvan University's Faculty of Education implemented ODL courses in a three-semester M.Ed. in science education and PG Diploma in social studies at Mahendra Ratna Campus, Tahachal, in 2019. A participant expressed that

The faculty of education is offering ODL education in three programs: a six-semester Master of Social Studies Education (2021), a three-semester Postgraduate Diploma (2024), and an eight-semester Bachelor of

Social Studies Education (2024). Since 2024, ODEC has been offering a blended-mode Masters of Educational Science in Digital Pedagogy (MESDP) at Tribhuvan University.

Tribhuvan University highlights the transformative role of ICT in enhancing teaching and learning outcomes, shifting traditional education from teacher-centered to student-centered learning. In the 21st century, university teachers grapple with challenges like inadequate support, professional development, and difficulties in using advanced ICT tools, including computers and internet access.In this context, one of the teachers shares her experiences as follows:

In the 21st century, teachers require basic computer literacy, software proficiency, ICT integration, content knowledge, digital literacy, adaptability, classroom management, assessment skills, professional development, resource access, and confidence. The university should enhance its ICT competencies by combining necessary skills and practices for effective teaching using ICT.

The next participant explores his experiences as follows:

Universities can improve teachers' ICT competencies through various strategies, including professional development programs, mentorship, infrastructure development, incentives, curriculum integration, technical support, partnerships, research, policy development, and continuous improvement. These strategies can help us with necessary skills, motivate us to embrace ICT, and create a supportive ecosystem for technology use in teaching and learning.

In Nepal, Tribhuvan University, Nepal Open University, Kathmandu University, and Purwanchal University are offering distance education for M. Ed., PGD, and a one-year B. Ed. programs, aiming to improve higher education access.Tribhuvan University teachers and students face challenges in open and distance learning due to limited ICT competencies in their teaching and learning activities.

Professional Development and Training Programs

Professional development and training programs are essential for enhancing ICT skills and knowledge in teaching and learning. Professional development programs provide workshops and training on ICT tools, offering basic and advanced courses for different skill levels and ensuring ongoing and updated training to keep pace with technological advancements. Universities can improve ICT skills through structured professional development programs, focusing on technological proficiency and pedagogical integration. These programs should be continuous, context-specific, and provide teachers with opportunities to practice and experiment with new technologies. ElSayary (2023)suggests that effective professional development should concentrate on both technological proficiency and pedagogical integration of ICT, while Wu et al. (2019) and

Zhang (2021)emphasize the importance of providing teachers with opportunities to practice and experiment with new technologies in a supportive environment. Bendtsen et al. (2022)propose continuous, collaborative professional development is more effective than one-time workshops, while Pan and Cheng (2023)highlight the importance of professional learning communities for teachers. In this context, one of the participants shared their views:

In 2019, I participated in professional training at Mahendra Ratna Campus, where I joined in two semester PGD programs, including a three-day schedule for interaction forums using LMS and MS Teams. The instructor organized various activities such as interaction forums, student assessments, material management, quizzes, and group discussions, which I now utilize in my online learning teaching. The individual seeks teacher professional development training from TU to enhance their skills in using ICT in their professional life.

Synchronous open and remote learning (ODL) offers flexibility and enhanced education access, but also presents challenges for students and faculties, necessitating awareness for successful implementation. A participant shares their experience: In my perception, the university should utilize its new teachers as raw materials and enhance them with ICT and other instructive skills according to the institution's requirements. Universities should promptly organize teacher training and promote colleges where ICT is widely used. The college should offer incentives to teachers who utilize ICT in our classrooms and motivate them to enhance their skills.

The participants emphasized the importance of teacher training, which is the responsibility of universities through workshops. ElSayary (2023)also highlighted the importance of training in enhancing teachers' ICT competencies. Another participant argued that:

I think that the university should conduct at least six-month training sessions for enhancing ICT skills and course content due to the constant technological advancements in the 21st century (Esfijani & Zamani, 2020; Garzón Artacho et al., 2020; Tondeur et al., 2018), Abedi (2023) and Kabasiita et al. (2024) emphasize the need for regular training for teachers to enhance their ICT skills. Their findings show that training supports enhancing the ICT skills of teachers, as they may struggle to integrate it effectively into their teaching-learning practices without proper training. Another participant shared their similar experience demonstrating with others as follows:

If the university provides intensive training in digital tool handling for us, then we can perform better ICT skills in our teaching and learning activities. Institutions must play a crucial role in enhancing our ICT skills. It helps us to integrate ICT skills in teaching economics, econometrics, micro, and macro subjects. However, we struggled with our performance due to extensive experience in traditional pedagogies without the use of technology.

All these statements and research findings revealed that the role of universities is very important for enhancing teachers' ICT skills through structured training programs, particularly in subjects like economics. The program offers subject-specific, structured ICT training to enhance teaching methods using digital tools and software, facilitating the transition from traditional to technology-enhanced pedagogies. The effectiveness of these initiatives is supported by participant experiences and feedback.

Infrastructure and Resources

The development of ICT infrastructure and resources is important for enhancing teachers' competencies for quality teaching. ICT infrastructure includes hardware, software, networks, data centers, and cloud services used by organizations to manage information systems and enable communication, including hardware, operating systems, applications, databases, and networks. ICT resources encompass structured and unstructured data, human resources like IT professionals, security systems like firewalls, communication tools like email, and mobile devices like smartphones and tablets (Masango, 2014; Oladipo & Okiki, 2020; Patel & Gupta, 2021).Tribhuvan University needs significant investments to upgrade facilities and equip teachers with ICT tools, requiring support from the university/campus to enhance their ICT skills (Joshi, 2023). A participant's perception is expressed as:

The university should provide teachers with computers, software, and applications to enhance their digital skills. Without a motorcycle, we cannot drive, requiring infrastructure like reliable internet, a computer lab, a projector, a smart board, and easy access to a technical assistant.

Participants demanded digital infrastructure and resources from campus administration and university authorities to enhance their ICT skills for pedagogical purposes, similar to previous research focusing on resource availability. Masango (2014); (Stephens, 2020), Lewis and Martin (2018) and Patel and Gupta (2021) have also highlighted the importance of ICT infrastructure and resources for improving teachers' skills in economics teaching. Another participant reported in this context as follows:

The university needs to encourage the teachers by providing the ICT infrastructure, such as Stata, to calculate the data. In abroad, universities purchase this type of software and provide it to teachers and students, but there are no provisions for such facilities. The provision of such facilities by universities is expected to significantly enhance the ICT skills of teachers.

Previous research has highlighted the significant correlation between ICT infrastructures and teachers' ICT skills. Kundu et al. (2020), (Sharma, 2023), and Kiteetu et al. (2023)found a strong correlation between ICT infrastructure and teachers' ICT skills, emphasizing its importance in education.A participant shared their perception as:

Campus need to purchase laptop to all the staffs, campus need to free Wi-Fi zone for the /campus area,Campus/University should invest a handsome amount in proper management of ICT learning to enhance the lecturers' ICT skill.Campus should provide Laptop, Tablet, IPad, E-Library, Projectors, High speed Internet access, to the campus teachers and staffs.

Participants emphasized the need for university and campus support in providing ICT infrastructure and resources for teachers to enhance their digital skills for pedagogical purposes. This aligns with previous research that underscores the importance of resource availability in enhancing teachers' ICT skills.

Supportive Culture

This supportive environment enhances teachers' comfort in adopting new technologies, developing ICT competencies, and effectively integrating these skills into teaching practices, resulting in improved student learning outcomes. A supportive culture in education fosters innovation, continuous learning, peer mentoring, resource allocation, recognition of ICT integration efforts, collaborative environment, leadership support, technical support, curriculum flexibility, feedback mechanisms, and a growth mindset for teachers. Promoting ICT integration in education requires positive attitudes, university leadership, professional development incentives, peer support, and mentoring programs to foster a collaborative environment and encourage technology adoption (Mumin & Sulong, 2023; Panagiotakopoulos et al., 2023). In this issue, a participant argued that:

The university should foster a culture that encourages and rewards the use of ICT in teaching. Recognizing and appreciating teachers who effectively integrate ICT into their pedagogy will motivate others to do the same.

Previous studies highlight the importance of a supportive culture and institutional support in fostering teachers' willingness to adopt new technologies, such as ICT (Mabkhot & Ghouri, 2023; Mwalongo & Mkonongwa, 2023).Another participant shared similar views to those mentioned in the previous excerpts as follows:

ICT workshops and collaborative platforms where teachers can share their experiences and learn from each other should be established. This kind of peer support is invaluable in improving our ICT skills.

Support from institutions, colleagues, and learning communities is important for teachers to enhance their ICT skills, especially through a collaborative culture focused on digital technology. Panagiotakopoulos et al. (2023)highlighted the effectiveness of professional learning communities in fostering a collaborative culture that facilitates continuous professional development and skill enhancement in ICT. Creating an ICT-friendly environment in teaching-learning activities at universities or campuses can facilitate easy improvement in teachers' ICT skills. The participant expressed their feelings in this context as follows:

The university should create an environment where we teachers feel safe to experiment with new technologies without fear of failure. This would encourage more teachers to try integrating ICT into their teaching practices.

Teachers need a supportive environment that encourages experimentation and risk-taking to enhance their confidence and proficiency in using ICT. Participants emphasize the significance of a supportive culture in enhancing ICT skills among teachers, emphasizing the need for collaboration, experimentation, leadership commitment, and technical support. Fostering a culture that promotes ICT proficiency among teachers can significantly enhance the quality of education in universities.

Curriculum Integration

Curriculum integration with ICT involves integrating technology into educational content, incorporating ICT skills, teaching digital literacy, and designing project-based learning for research, creation, and presentation. Universities should incorporate ICT into their curriculum to enhance teachers' skills and demonstrate its potential in their instructional practices, thereby improving learning outcomes. Teachers who integrate ICT into their education are more likely to adopt it in teaching, suggesting universities should incorporate ICT into their teaching methodologies (Kennedy, 2023; Perifanou et al., 2023).

The curriculum incorporated blended learning, combining in-person instruction with online activities, utilizing learning management systems for classroom interaction, and promoting digital content creation for coursework, assessments, and portfolio building. The curriculum incorporates adaptive learning, virtual and augmented reality, collaborative tools, computational thinking, digital citizenship, cross-curricular connections, real-world applications, and accessibility and inclusion strategies to improve learning experiences. The use of AI, VR/AR, collaborative tools, coding lessons, digital citizenship, cross-curricular connections, industry-standard software, and assistive technologies is being utilized to cater to diverse learning needs. Thus, universities should integrate information and communication technology (ICT) into their teaching methods to provide a practical framework for teachers. A participant’s voice is here:

Integrating ICT into the curriculum is essential for modern teaching. Universities should provide structured programs that embed ICT training within the curriculum. This ensures that all teachers, regardless of their initial skill level, receive continuous and relevant ICT education tailored to their subject areas.

Muharom et al. (2023)emphasize that effective professional development should incorporate both technological proficiency and pedagogical integration of ICT. Esfijani and Zamani (2020) argue that curriculum integration of ICT training is crucial for effective use of technology in education. Universities are crucial in creating and implementing curricula that incorporate comprehensive ICT training, ensuring teachers are well-equipped to integrate technology into their teaching. The participants emphasized the importance of integrating ICT into their curriculum and pedagogy, with one participant focusing on:

Curriculum integration of ICT should be a priority. Universities must revise their teacher education programs to include mandatory ICT modules. These modules should focus on practical applications and provide hands-on experiences to help teachers effectively incorporate technology into their teaching practices.

The integration of ICT into teachers' professional development courses by universities can significantly improve their ICT skills. Wu et al. (2019)emphasized the significance of integrating ICT training into the curriculum for teachers to practice and experiment with new technologies in a supportive environment. Another participant in the study shared their belief in this issue as follows:

The role of the university is pivotal in integrating ICT into the curriculum. By embedding ICT skills training within our ongoing education, universities can create a culture of continuous learning and adaptation to new technologies. This approach would significantly improve our ability to use ICT in teaching.

Alkaabi (2023) and Gonçalves et al. (2023)suggest that continuous, collaborative professional development is more effective than isolated workshops, and integrating ICT training into the curriculum aligns with this approach. Pan and Cheng (2023)and Azukas (2019)suggest fostering professional learning communities for teachers by integrating ICT training into teacher education programs. The integration of ICT training into teacher education programs promotes collaborative learning and fosters the development of these communities.

This paper emphasizes the significance of curriculum integration in enhancing teachers' ICT skills, based on both participant perspectives and literature evidence. Universities play a significant role in integrating ICT training into teacher education, ensuring continuous professional development to equip teachers with effective technology use in teaching practices.

Conclusion

This paper explores a qualitative analysis of the university's initiative to improve teachers' ICT competencies for integrating ICT into teacher education programs. Universities are recognizing the significance of digital literacy and are implementing strategies such as curriculum reforms, infrastructure development, and professional development programs. The widespread adoption of ICT is hindered by factors such as limited resources, inconsistent policies, and varying levels of institutional support. The university should enhance teachers' ICT skills through professional development programs, infrastructure, supportive culture, and curriculum integration, ensuring continuous, context-specific training aligns with institutional goals. Adequate infrastructure, supportive culture, and ICT training are crucial for effective education. Universities can improve teachers' ICT competencies by incorporating technology into the curriculum, fostering continuous learning and adaptation to new technologies, and enhancing overall education quality.

The future of addressing these challenges could be significantly improved through a coordinated approach involving collaboration between universities, government bodies, and international organizations. In Nepal, the universities can equip teachers with necessary ICT skills for 21st-century education by fostering a supportive culture, aligning ICT integration with pedagogical goals, and ensuring sustainable implementation strategies. Further research and evaluation are needed to refine these initiatives and enhance their impact on teacher preparation and student learning outcomes in Nepal.

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