

Bridging Digital Gaps: ICT Utilization and Competency of Faculty Members

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Received: 04 Sept 2025	The digital age has revolutionized the teaching, learning, and research in the higher education by the use of information and communication technology (ICT). The faculty members are the major actors in the process of incorporating ICT in classrooms to promote student participation, better learning, and meet the international education standards. Nevertheless, use of ICT and competency is diverse in different institutions brought about by factors like digital literacy, resources availability, institutional support and personal preparedness to change. The article examines the degree of ICT competency among faculty members, the degree of ICT use in teaching and research, problems faced during the process of digital integration, and ways of improving faculty digital abilities. The findings suggest that enhancing ICT competency among faculty requires strengthening both their technical and research skills while also addressing challenges in pedagogical integration. To achieve this, institutions should invest in targeted professional development programs, digital pedagogy training, and ethical ICT practices, enabling faculty to fully leverage digital technologies for teaching, research, and scholarship. Keywords: Teaching and Learning, Research and Collaboration, Communication and Administration, Skill Gaps and Technical Skills
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Introduction

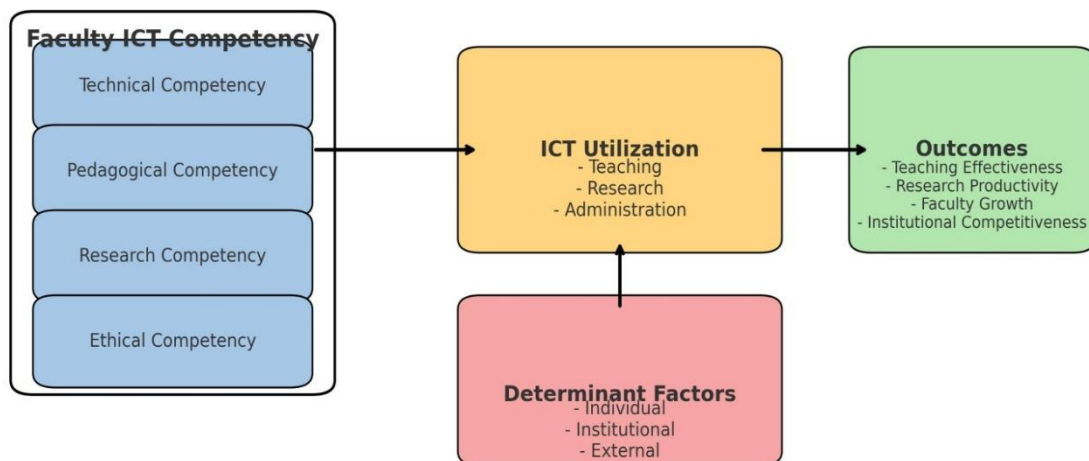
The digital revolution has changed the face of higher education to the extent that ICT integration has become an inseparable part of the effective pedagogy. The faculty is supposed to be flexible to technological shifts, adopt online learning and blended learning, as well as learn in digital scholarship. ICT competency is defined as the skills of teaching, research and academic collaboration with digital tools whereas ICT utilization indicates the real implementation of these tools in academic work. Poor ICT competence or institutional support can inhibit the performance of the faculty thus affecting the quality of education. Knowledge of faculty ICT use and competency is pivotal in developing specific interventions to make sure that the teachers are ready to meet the needs of the 21st-century digital classroom. Communication will improve the decision-making processes, accountability, and problem solutions when it is associated with the good administration. Coordination and sharing of information is also enhanced with the use of digital tools. Communication and administration are two elements that will help to provide an environment that is conducive to academic excellence, organizational sustainability and endless improvement in teaching, research, and service.

ICT Competency among Faculty Members

Faculty competency levels often depend on prior exposure to ICT, professional development opportunities, and personal motivation to adopt technology. Younger faculty tends to display higher adaptability, while senior faculty may face challenges in transitioning from traditional methods to digital platforms. Education transforms when it is taken up as a co-creator of knowledge, between teachers and students, as it equips an individual with lifelong learning and in the real world.

Figure: 1

Conceptual Framework: ICT Utilization and Competency among Faculty Members



ICT Utilization in Teaching and Research

The degree of ICT utilization varies across institutions and disciplines. Common applications include:

1. **Teaching and Learning:** Teaching and learning are the pillars of academic excellence that revolve around the spread of knowledge, critical thinking, and development of skills. Teaching does not just focus on content but will bring curiosity, creativity, and problem-solving skills to the learners. In turn, learning is an active process, which implies reflection, application and interaction with different perspectives. The combination of new pedagogies, including technology-mediated learning, experiential learning, and collaborative pedagogies, improves student achievement. Inclusiveness is also an important aspect in teaching and learning, and the strategies are adapted to various learning requirements.
2. **Research and Collaboration:** The focus of knowledge advancement, complex problem resolution and innovation is in the context of research and collaboration. Research nurtures the spirit of enquiry, which allows the finding of new things and uses that bring about academic, social, and economic growth. Joint efforts, extending across disciplines as well as across

institutions, enhance the effects of research through the gathering of resources and experience and the presence of different viewpoints. Via collaboration, scholars and practitioners deal with international issues like sustainability, healthcare, and digital transformation. Joint research also gives the students and new academics with the career an opportunity to participate in valuable projects. Finally, research and collaboration empower academic communities, which exchange knowledge, leading to the society growing and becoming innovative.

3. **Communication and Administration:** Communication and administration are pillars needed to maintain smooth operations of learning and organizational systems. Good communication will enhance clarity, transparency, and inclusiveness across the gap between students and faculty and administration. It helps to create a culture of respect, co-operation, and trust. Administration on the other hand offers the backbone of structure which is planning, organizing and management of resources in order to attain efficiency in the advancement of the institutional objectives.

Strategies for Enhancing ICT Competency and Utilization

1. **Skill Gaps:** Skill gaps are created when individuals or institutions do not have the competencies to address the changing academic, technological or professional needs. In the educational field, this can be in the form of low levels of digital literacy, research ability, or innovation in teaching. These gaps make it difficult to achieve the desired results and keep pace with the emerging trends by both the faculty and students. The strategy of skill gaps elimination involves specific training and professional growth and curriculum alignment with the industry requirements. Sealing these gaps guarantees better employability, better teaching practices and being able to play an important role in the development of the institutions and society.
2. **Resource Constraints:** The resource constraints are the unavailability of financial, technological, and human resources that hinder institutional development. Lack of access to modern tools, insufficient infrastructure, and underfunding are some of the factors that influence teaching, research, and administrative efficiency. Moreover, faculty overwork or lack of adequate resources may limit innovation. Such limitations tend to cause differences in the equipments of well-equipped and resource-poor institutions. The solution to such obstacles requires effective resource management, external collaboration, and the effective usage of digital technologies. In case resources are used in the most efficient way, institutions can increase quality, productivity, and sustainability despite financial and infrastructural constraints.
3. **Institutional Obstacles -Attitudinal Resistance:** Attitudinal resistance happens when faculty, students or administrators are unwilling to change, become innovative or adopt new policies. Their resistance could be based on fear of uncertainty, non-awareness or habitual to traditional ways. It may slow down the implementation of new pedagogical practices, electronic tools, or research partnerships in academic settings. Attitudinal barriers need a powerful leadership, effective communication and training programs that instill confidence in the changing processes. Incidents of resistance can be reduced by developing an environment that is open, inclusive, and a culture of continuous improvement to ensure innovation and growth.
4. **Institutional Barrier- Workload Pressures:** In educational and professional facilities workload stress is a significant factor where members of the faculty and staff are likely to have balanced teaching, research, administrative and service teams. Overwork causes stress, low productivity, and burnout which eventually impact on quality outcomes. It can also reduce innovation, team work, and self-development. Institutions have to resolve the workload problems by distributing the tasks fairly, having a good time management policy and backup

support like digital tools or administrative support. Organizations can make the workplace healthier and more efficient while reducing unnecessary burdens and focusing on well-being, which holds long-term performance.

5. **Capacity-Building Programs:** Capacity-building programs are designed to empower capabilities, knowledge and skills of faculty, staff, and students in learning institutions. These efforts are aimed at improving the teaching practices, research, leadership and digital literacy. Skills gaps can be bridged with workshops, training and mentoring opportunities to enable people to conform to the changing academic and industry demands. By investing in capacity-building, institutions become innovative, build confidence, and become flexible. Such programs do not only enhance the performance of an individual but also growth and competitiveness of an institution. Capacity-building will provide resilience and ongoing enhancement of higher education and professional practice by establishing a culture of lifelong learning.
6. **Institutional Support:** The institutional support is also essential to facilitate successful teaching, research, and professional development. It is characterized by making sufficient resources, infrastructure, mentoring and administrative support to empower faculty and learners. Other forms of institutional support such as funding, rewarding of performances, and the possibility of cooperating are also strong. Through lessening the pressure of workload and providing readily available resources, institutions establish the environment in which innovation and creativity can flourish. Moreover, supportive leadership is inclusive and encourages one to adopt change. Even the most competent people will be restricted without institutional reinforcement. Therefore, it must be supported in the long run in order to increase the productivity and job satisfaction as well as the overall quality of education and research.
7. **Policy Frameworks:** Policy frameworks present the formatted guidelines and regulations that influence the practices and decision making within the institutions. They set standards in the areas of curriculum development, assessment, ethics of research and professional development in the field of education. Having clear and flexible policies makes them accountable, transparent and in line with the international academic trends. Other burning issues like digital transformation, inclusivity, and sustainability are also managed using effective frameworks. Policies also lead institutions towards continuous improvement and innovation by setting measurable goals and systems of monitoring them. Effective policy frameworks do not only establish expectations, but also enable the stakeholders to be bold. They eventually serve as the baseline of quality assurance, institutional credibility and longer term growth.
8. **Communities of Learning:** Learning communities are collaborative and encourage faculty, students and professionals to share knowledge, provide peer support, and solve problems together. Through collaboration, members can enjoy the advantages of having different points of view, interdisciplinary understanding and experience. These communities also promote mentoring, innovation, and reflective practice and provide a conducive environment where cooperation is more important than competition. Technology also enhances these networks by facilitating virtual communities, international work as well as sharing of resources. Collaborative learning communities are more inclusive and engaging in educational institutions and lead to lifelong learning. They also fill the theory practice gaps, connecting the academia and industry. Finally, these types of communities enable people and organizations to react to challenges as one group and have more impact.
9. **Continuous Professional Development (CPD):** (CPD) is the constant process of gaining and upgrading the skills in order to be able to remain effective and relevant in the profession. CPD allows faculty and staff in the educational sector to be responsive to the emerging trends in terms of pedagogical strategies, technologies, and research. It entails workshops, certifications, conferences and self directed learning. CPD promotes reflection, critical thinking and professional development so that teachers and professionals are able to respond to

changing needs. The institutions that focus on CPD develop excellence, innovativeness, and resilience. Integrating CPD into the academic culture, one is stimulated to become a lifelong learner, adding his or her value to teaching, research and organizational sustainability.

Research Gap

Even though digital technologies are rapidly entering the world of higher education, there is still a considerable gap in research on the profundity and extent to which faculty members apply ICT and competence. The existing literature tends to concentrate on the resources or overall trends in adoption, but rarely on the subtle variations in the ICT skills of disciplines or age group or institutions. In addition, the bulk of the studies is located in developed areas and produces little information on the issues of faculty in resource-constrained settings. Lack of exploration on relation between ICT competency and teaching effectiveness, research productivity and administrative efficiency also exists. In addition, numerous studies fail to comprehensively describe the attitudinal barriers to the adoption of ICT by faculty members, workload pressures, or the impact of institutional support systems on ICT adoption. As the needs of digital pedagogy, online collaboration, and technology-based assessment increase, the question arises on the alignment of the competencies of the faculty with the requirements. The need to fill this gap will assist in detecting specific training, policy making and resource allocation strategies that would improve incorporation of ICT in higher education. In the absence of such research, institutions will risk lagging behind in their efforts to equip educators and students to face the many opportunities and challenges that are presented by the digital era.

Importance of the Study

The significance of researching the use of ICT and its competence among the faculty members is the fact that it directly relates to the quality of teaching, research, and administration in the digital era. The faculty members play an essential role in innovation and transfer of knowledge; hence their capacity to coordinate ICT tools is what will define the level of institutional adaptation to the changing educational environment. This research offers a great insight on the willingness of teachers to adopt technology-based instruction methods, e-learning applications, and research data that can help them to work together globally. Another thing it illuminates is the impediments encountered by the faculty, which may include lack of skills, change-resistance, or resource scarcity, which can impede institutional development. Understanding these challenges and opportunities, the study can help in coming up with policies, training programs as well as capacity-building initiatives that can improve faculty performance. Moreover, the results can inform the institutions to ensure the alignment of their digital change initiatives with the skills of their employees to ensure a sustainable growth and academic excellence. In the larger sense, faculty ICT competency knowledge is important to close the digital gap, ensure equity in learning, and equip the coming generations to be successful in a technologically advanced world. The study therefore is very timely and relevant to higher education.

Statement of the Problem

The good use of Information and Communication Technology (ICT) has become the necessity among the members of the faculty in higher education institutions in the digital era. Nevertheless, not all educators can fully embrace ICT in their instruction, research, and administration duties because the competency levels are not the same, institutional support can be insufficient, and some perennial obstacles like the workload demands and resistance to changes can be detected. Although the possibilities presented by the use of technology in the field of interactive learning, online collaboration and efficient management are unprecedented, the benefits are not equally distributed. There are those

faculty members who are very proficient and flexible whilst others have difficulties with using even simple tools, which puts a gap in the educational provision. Such a discrepancy has detrimental impact on student engagement, quality of teaching, and competitiveness of the institution in the digitally interconnected world. In addition, most institutions do not have systematic policies or capacity-building programs that can ensure that they plug such gaps. The issue, thus, is not only in the inequitable allocation of resources, but also in the lack of focus on constant professional development and competency building of faculty. Unless specific plans are made to improve ICT use, institutions of higher learning may fall behind in the global standards and thus have limited chances of establishing innovation, inclusivity and excellence in the digital age.

Objectives

1. To examine the extent to which faculty skills (technical, pedagogical, research, scholarly, and ethical) collectively explain the variance in ICT utilization and competency.
2. To assess the predictive power of faculty skill sets in determining ICT competency

Methodology

The present study adopts a quantitative research design to investigate the role of faculty skills in determining ICT competency. A total sample of 300 respondents was selected using a convenient sampling technique. The respondents comprised faculty members affiliated with Bharathiar University and its constituent colleges. This sample size was considered adequate for applying statistical analyses such as regression and ANOVA, ensuring meaningful interpretation of results.

Primary data was collected through a structured questionnaire designed using Google Forms. The instrument included items related to technical skills, pedagogical skills, research skills, scholarly skills, and ethical skills, all of which were identified as critical predictors of ICT utilization and competency. The questionnaire was distributed online, ensuring accessibility, ease of response, and wider reach among the targeted faculty members. To enhance the reliability of responses, the anonymity of participants was maintained, and they were assured that the data would be used strictly for academic purposes.

The convenient sampling method was chosen due to time and resource constraints, as well as the accessibility of the target respondents. While this approach may limit the generalizability of the findings, it provides useful insights into the competencies and challenges faced by faculty members within the specific institutional context of Bharathiar University.

The collected data was systematically coded and entered into statistical software for analysis. Descriptive statistics were first employed to understand the demographic and skill-related profiles of the respondents. Inferential analyses, including regression and ANOVA, were then applied to test the significance of the proposed model and examine the contribution of different faculty skills to ICT competency.

This methodology, therefore, provides a structured approach to capturing the perspectives of faculty members and assessing the influence of their skills on the effective utilization of ICT in teaching, research, and scholarship.

ICT Utilization and Competency among Faculty Members in the Digital Age

In the digital age, the effective utilization of Information and Communication Technologies (ICT) has become essential for enhancing teaching, research, and academic practices among faculty members. The integration of ICT not only supports innovative pedagogy but also improves scholarly productivity and ethical engagement in digital environments. Faculty competency in ICT is influenced by multiple skill domains, including technical, pedagogical, research, scholarly, and ethical skills, which collectively shape their capacity to use digital tools effectively. Understanding the relationship between these predictors and ICT utilization is vital for higher education institutions seeking to improve quality and competitiveness. This study employs regression analysis to examine how these skills contribute to faculty members' overall ICT utilization and competency.

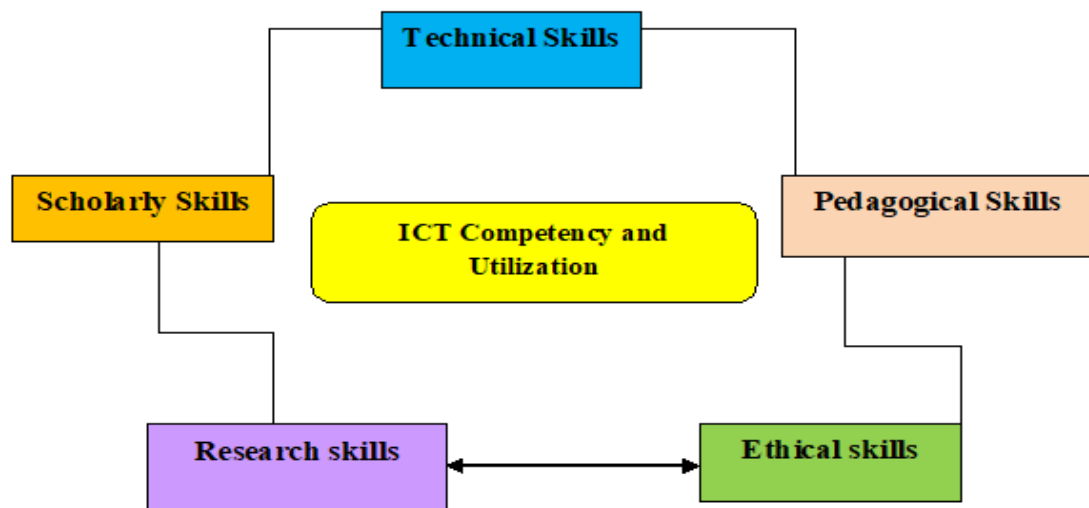
ICT UTILIZATION AND COMPETENCY

Table 1
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.334 ^a	0.301	0.294	0.947
a. Predictors: (Constant); Technical Skills, Pedagogical Skills, Research skills , Scholarly Skills and Ethical skills				

1. R (Multiple Correlation Coefficient = 0.334)
 - The correlation between the observed values of the dependent variable (ICT Utilization & Competency) and the values predicted by the model.

- An R of 0.334 suggests a low to moderate positive relationship between the predictors and ICT Utilization & Competency.
- 2. R Square = 0.301 (Coefficient of Determination)
 - 30.1% of the variance in ICT Utilization & Competency among faculty members is explained by the combined effect of Technical, Pedagogical, Research, Scholarly, and Ethical skills.
 - 69.9% of the variance is due to other factors not included in this model.
- 3. Adjusted R Square = 0.294
 - Adjusted R² corrects R² for the number of predictors, making it more reliable especially when multiple predictors are used.
 - 9.4% of the variance in ICT Utilization & Competency is explained after adjustment.
 - The closeness of R² (0.301) and Adjusted R² (0.294) shows the model is reasonably stable and not heavily over fitted.

Inference: The model demonstrates that faculty members' technical, pedagogical, research, scholarly, and ethical skills collectively account for about 30% of the differences in ICT utilization and competency. While this is a meaningful contribution, it also implies that other factors (such as institutional support, access to ICT infrastructure, motivation, training opportunities, or attitudes toward technology) play a larger role (around 70%).

Table 2

ANOVA

Model		Sum of Squares	difference	Mean Square	F	Sig.
1	Regression	236.115	5	20.532	19.634	0.000 ^b
	Residual	294.063	294	.827		
	Total	389.178	299			
a. Dependent Variable: ICT utilization and competency						
b. Predictors: (Constant), Technical Skills, Pedagogical Skills, Research skills , Scholarly Skills and Ethical skills						

The ANOVA results indicate that the regression model is statistically significant, $F(5, 294) = 19.634$, $p < 0.001$, demonstrating that the combined predictors—technical, pedagogical, research, scholarly, and ethical skills—explain a significant portion of the variance in the dependent variable. The regression sum of squares (236.115), relative to the residual sum of squares (294.063), shows that the model accounts for a considerable amount of variation. These results suggest that faculty skill sets play a meaningful role in predicting ICT utilization and competency (or purchase intention, depending on the context), confirming the model's reliability and overall fit to the data.

The ANOVA confirms that the regression equation is a good fit and the set of predictors (Technical, Pedagogical, Research, Scholarly, and Ethical skills) significantly explains variation in the dependent variable.

Table 3

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.765	.216		3.536	0.000
	Technical Skills	0.219	.595	0.240	4.150	0.002
	Pedagogical Skills	-0.161	.485	-0.359	-2.678	0.00
	Research skills	0.230	.573	0.31	3.320	0.00
	Scholarly Skills	0.121	.408	0.184	1.821	0.217
	Ethical skills	0.192	.420	0.256	3.217	0.001**
a. Dependent Variable: ICT Utilization and Competency						

The coefficients analysis reveals that technical, research, and ethical skills are significant positive predictors of ICT utilization and competency among faculty members. Research skills emerged as the strongest contributor, followed by ethical and technical skills. Interestingly, pedagogical skills showed a negative significant effect, suggesting possible difficulties in aligning instructional practices with ICT integration. Scholarly skills, while positive, were not statistically significant. Overall, the findings emphasize that ICT competency is strongly shaped by faculty members' research, technical, and ethical capabilities.

Discussion

The results of this analysis point to the complicated dynamics that define the use of ICT and competency in the digital age of faculty members. Findings of the regression model indicated that technical, research, and ethical skills are important factors that can increase ICT competency as they are in line with previous research that proved a strong role of digital literacy, research-focused ICT use, and ethical digital practices in higher education. The researchers who are more likely to use ICT to search literature, to analyze and distribute the data, and to enhance the levels of digital competence are the faculty members possessing solid research skills. Equally, moral competencies developed into a determining factor, which highlights the importance of responsible ICT practices, such as privacy of data, academic honesty and copyright awareness as traditional digital practices.

The pedagogical skills had a negative significant correlation with ICT competency. This surprising revelation could imply that the faculty members have difficulties incorporating ICT into their pedagogical processes, which could be attributed to the lack of training, pedagogical unwillingness, or the habit of using traditional teaching practices. There has been also a gap in past studies between knowledge of pedagogy and practical application of ICT to instruction that could not be statistically significant when the institutional support and resources are low. This implies that although digital scholarly practices (like having academic profiles or publishing online) are applicable, they do not necessarily improve ICT use in everyday life as opposed to technical and research oriented competencies.

The findings indicate that to develop ICT competency among the faculty, it is necessary to consider improving the technical and research capabilities as well as the obstacles in the pedagogical integration. Institutions must thus spend on specific professional development initiatives, digital pedagogy training

as well as ethical ICT training so that faculty can be able to reap all the benefits of digital technologies in teaching, research and scholarship.

Practical Implications

The findings of this research give a number of valuable implications to higher learning institutions. First, as research and technical skills have one of the strongest correlations with ICT competency, universities need to focus on sustained training in digital research instruments, databases, and analysis software, so that faculty can initially become as well-versed in seamless incorporation of ICT in academic work as possible. Second, the importance of ethical skills is a crucial aspect that emphasizes the need to organize specific workshops devoted to digital ethics, copyright regulation, and responsible data use that are being more important in the digital age. Third, the adverse impact of pedagogical skills indicates that the institutions need to reconsider the introduction of digital pedagogy. Faculty might need additional practical guidance, mentorship and incentives to feel comfortable with using ICT in the teaching process. Lastly, the non-significance of scholarly skills means that although digital scholarly engagement is an asset it might require institutionalization, through policies on promotion and evaluation of digital scholarship. All these implications together indicate that universities need to take a holistic and strategic stance in terms of achieving balance between technical, ethical training, research training, and pedagogical training to improve ICT-use and competency in faculty members.

Conclusion

ICT utilization and competency among faculty members are critical determinants of educational quality in the digital era. While many educators have embraced technology, disparities in access, skills, and institutional support continue to exist. To prepare faculty for future-ready teaching and research, institutions must prioritize professional development, infrastructure investment, and policy reforms. Ultimately, enhancing ICT competency will not only improve faculty effectiveness but also equip students with the digital skills needed for success in a knowledge-driven global economy. This study examined the influence of technical, pedagogical, research, scholarly, and ethical skills on ICT utilization and competency among faculty members. The regression results revealed that research, technical, and ethical skills significantly enhance ICT competency, with research skills emerging as the strongest predictor. Conversely, pedagogical skills showed a negative effect, suggesting persistent challenges in aligning instructional practices with ICT integration, while scholarly skills had no significant impact. These findings highlight that ICT competency is shaped less by traditional academic functions and more by practical digital skills, research engagement, and ethical awareness. For institutions, the results underscore the need for targeted interventions that strengthen digital pedagogy, promote ethical ICT use, and expand faculty training in research technologies. By adopting a comprehensive capacity-building approach, higher education can better equip faculty members to thrive in the digital age.

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