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FINDINGS

This thesis explored the Role of Information and Communication Technology (ICT) in the teaching-learning of science at the undergraduate level, examining perceptions of both science teachers and students across five key dimensions: curriculum, pedagogy, research, learning resources, and student support, as well as the barriers they face.

Findings revealed that science teachers largely recognize the importance of ICT in curriculum development, with around 72.9% using it frequently for planning and 66.7% using it for content creation and inclusivity. However, digital labs and the creation of extended courses remain underutilized, with less than 55% engaging regularly in these areas. In pedagogy, ICT is widely used for admissions transparency (87.5%) and professional development (85.5%), but fewer teachers consistently apply it for participatory learning, online assessments, or use of platforms like Google Classroom. In research, the majority of teachers (91.7%) use ICT for publications and 85.5% for accessing databases, though areas like funding, consultancy, and real-world application through extension activities show comparatively lower engagement. ICT tools such as projectors and e-resources are frequently used in teaching (81.3% and 75% respectively), yet remote collaboration and virtual meetings are less consistently adopted. In terms of student support, 77.1% of teachers use ICT to address diverse learning needs, but tracking student progression and alumni engagement still show gaps.

Students also show a moderately positive perception of ICT. About 67.8% regularly use ICT for course engagement, and 66.4% align it with learning outcomes, though fewer students (around 50–58%) utilize it for innovative learning, feedback, or global awareness. ICT is recognized for promoting transparency in admissions (76%) and supporting personalized learning (69.1%), but student participation in blended learning, flipped classrooms, and experiential methods is limited to 56% or less. In research, while 61.6% of students use ICT for dissemination and 60.8% for extension work, many still report inconsistent engagement, especially in sustainable practices (only 55.3%). Interactive tools are used by 72.9% of students in class, but virtual labs, LMS platforms, and co-curricular resources are underused. Only about 50–53% of students consistently access e-resources and digital support systems.

Barriers perceived by teachers include limited ICT adoption in content innovation, with 18.7% admitting to infrequent use of digital tools, and 24% citing resistance to ICT integration. Concerns about gender equity in ICT access (20%) and lack of support for students with special needs are prominent. Teachers also note challenges in accessing funding, attending faculty development programs, and using ICT for inclusive or international collaborations. Similarly,

students face significant barriers in utilizing ICT beyond the standard curriculum. Over 25% rarely use ICT for MOOCs, academic writing, or feedback, and fewer than 20% use ICT for curriculum adaptation, ethics, and collaborative learning. While administrative ICT use like admissions is strong, support for research dissemination, job placements, and inclusivity through assistive technologies remains weak. Gender disparities, insufficient institutional support, and limited opportunities for global collaboration and sustainable ICT practices are also recurring concerns.

Overall, the findings suggest that while ICT is recognized as a valuable tool in undergraduate science education, its usage remains inconsistent. Both faculty and students benefit from ICT in areas like curriculum planning and transparency, yet significant gaps persist in inclusive practices, research support, and innovation. Addressing these barriers is crucial to fully integrating ICT and maximizing its transformative potential in science education.