



Problems and Prospects of ICT Use in Higher Education: A Focus on Geography Education

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Abstract

Using Information and Communication Technology (ICT) in education has tremendous potential to transform teaching and learning. It has more potential in the spatially based subject like geography that depends on spatial information, electronic mapping, and human–environment investigation. The aim of this article was to assess prospects and problems of use of ICT in higher education in general and geography in particular. This research employed a qualitative method with a descriptive research design, utilizing both primary and secondary sources of information–, the study interviewed students, ICT teachers, informants, and campus managers in urban and semi-urban campuses and asked them questions on problems and prospects. ICT tools such as Geographic Information Systems (GIS), remote sensing, virtual simulation, and digital cartography enable interactive learning, virtual fieldwork, and collaborative investigation, resulting in spatial literacy and skill application. Integration of ICT in Nepal is led by ICT in Education Master Plan and Digital Nepal Framework; implementation is slowed down by infrastructural constraints, low digital literacy levels, teachers' training requirements, and budgetary constraints, especially at rural sites. The

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COVID-19 pandemic has paved the prospects of distance learning while highlighting persistent access and readiness inequities. Evidence shows that students in Nepal recognize the importance of ICT for their future work and actively seek knowledge despite infrastructural and pedagogical constraints; by strategically addressing gaps in infrastructure, local digital content, teacher training, inclusive curricula, and equitable access, ICT can be deeply embedded into higher education, revolutionizing the teaching of geography, stimulating interest in learning, and reducing disparities across the system.

Keywords: digital materials, e-learning, ICT, problems and prospects, and transformative Potential of ICT

Introduction

Applying Information and Communication Technology (ICT) to higher education has immense potential to transform teaching and learning, especially in geography. Geography as a subject is based most heavily on spatial data, mapping, and analysis of human–environment, and all are enhanced with ICT tools such as Geographic Information Systems (GIS), remote sensing, and digital cartography. These technologies enable students to view and explore the real world more dependably and interactively. Virtual field excursions, remote sensing data, and connections with global databases also enable transgressing traditional limits of time, space, and resources. ICT allows simulation learning on the impacts of climate change, urban planning, and disaster risk reduction (DRR) and increases access to accessible knowledge and spurs collaborative studies. Furthermore, the provisioning of the 21st century skills such as spatial literacy, digital mapping, and data analysis, ICT enables geography students to become competent to work in urban development, environmental management, and sustainable planning and help solve the key issues affecting the globe using technological innovation. In Nepal, the use of ICT in higher education has both problems and prospects. Forward-looking policies such as the ICT in Education Master Plan and the Digital Nepal Framework established good policy targets, but their translation into reality has been slowed down by limited finances, infrastructural bases, weak coordination, and weak monitoring.

Infrastructure remains a problem, particularly in rural areas of the country, where reliable internet connections, unreliable electricity supply, and limited access to digital technologies widen the digital divide and hamper the delivery of equal opportunities for learning (UNESCO, 2009). Formal ICT education and digital literacy are two areas where students and teachers fall behind by huge figures (Paudel, 2022). Traditional lecture method running deep remain dominant and restrict the application of colorful, student-focusing approaches in spite of availability of primitive ICT infrastructure (Shakya et al., 2018; Kunwar, 2020). Change resistance as well as socio-cultural factors also restrains the pace of digitalization. The COVID-19 pandemic unveiled these systemic vulnerabilities but hastened digital uptake as well by bringing into sharp focus the potential of e-learning, distance learning, and ICT-based changes.

Organizations like Nepal Open University, OLE Nepal, and the Nepal Wireless Networking Project have demonstrated how ICT can open up opportunities for rural learners by expanding digital infrastructure, introducing innovative teaching methods, and providing access to localized digital content. These initiatives have enabled students in remote areas to connect with quality educational resources, participate in interactive learning, and overcome barriers of distance and limited classroom facilities, thereby transforming rural education in Nepal. Nonetheless, socio-economic, geographical, and linguistic inequalities still hamper equal opportunities (Thapaliya et al., 2025). ICT's potential can become a tangible reality in Nepal only if it continues to invest in infrastructure development, curriculum redesign, teacher training, successful implementation of policies, and with the aid of public–private partnerships (College NP, 2025; KIST, 2025). In general, ICT is a powerful force that can improve the quality of higher education in Nepal. In geography teaching and learning it improves spatial awareness, data analysis, and fieldwork. In the entire educational structure, ICT facilitates new pedagogies founded on inclusivity, interactivity, and innovativeness. ICT, with the right investment and deployment, can have a revolutionary effect in making higher education as accessible as high quality and preparing students to face global and domestic challenges.

In policy papers like the Nurturing Excellence in Higher Education Program (NEHEP), the Digital Nepal Framework, and the ICT in Education Master Plan, the implementation of ICT in Nepalese higher education has never been low on the agenda. In Geography education, it is especially so because the subject relies on spatial analysis, cartography, GIS, and remote sensing software that are hugely ICT-reliant. Nonetheless, in spite of years of reform attempts, implementation has been slow and spasmodic, owing largely to poor coordination, poor finance, poor monitoring, and infrastructure collapse (Tripathi, 2024). All these deficiencies directly affect Geography departments in rural colleges and universities where digital mapping labs, GIS software, and reliable internet are unavailable (Kunwar, 2020). Systemic issues—such as poor power supply, little technical support, and poor infrastructure—have constrained ICT applications in Geography classrooms. As such, students resort to traditional maps and lectures rather than interactive GIS or virtual simulation environments. This constrains field-based virtual learning and reduces student-centered interaction (Paudel, 2022; Dulal, 2019; Timilsena et al., 2025). Moreover, low digital literacy of both students and teachers is still an impediment to the utilization of ICT tools in spatial data analysis and geographic visualization (Thapaliya et al., 2025; Kandel & Kaphle, 2021). The digital divide is a serious problem in Nepal, Geography, language, age, and socioeconomic status-based inequalities also hinder equal ICT integration in higher education (Shakya et al., 2018). Such differences are particularly significant in Geography Education, which entails the use of high-resolution images, web mapping sites, and accessing real-time data. Nevertheless, initiatives such as the Nepal Open University have simplified access to distance learning and internet studies, which enables rural area Geography students to access ICT-based facilities such as geospatial education and virtual fieldwork (Jha,

2020). Projects such as OLE Nepal and Nepal Wireless Networking Project demonstrate how ICT tools cross geographical space to reach knowledge. Digital pedagogy research points out governance, institutional support, teacher attitude, and teacher training as factors influencing the use of ICT (Adhikari, 2021). For the subject Geography, these factors have implications for how much GIS, Google Earth, and other spatial technologies are used by teachers in teaching. ICT also enhances learner autonomy through autonomous interpretation of geographic data by students, as is the case with Sen and Nussbaum's capacity approach to human development (Jha, 2020). The COVID-19 pandemic, apart from exposing inherent digital-readiness inequalities, also accelerated the utilization of online platforms for teaching spatial analysis, remote mapping, and geography-based virtual projects (Pokhrel & Pokhrel, 2023; Thapaliya et al., 2025). Discipline-based language research accentuates further complications in teaching technical jargon in courses like Geography, where both English and Nepali study materials are necessary (Paudel, 2022; Khadka, 2021). For optimal use of the potential of ICT, higher education in Nepal requires systemic reforms like curriculum revision, more opportunities for research, and government-private sector collaboration for developing GIS infrastructure (College NP, 2024; Timilsena et al., 2025). Additionally, cybersecurity, content localization, and quality assurance are ongoing issues of concern (Barik & Karforma, 2012).

Briefly, despite systemic and contextual limitations, the use of ICT in Geography Education holds promise for improving spatial learning, student motivation, and bridging geographical differences in accessing higher education. This study examines the problems and prospects of ICT use in higher education, particularly in geography education in Nepal, focusing on challenges, opportunities, and the role of policy and curriculum reforms. It finds that ICT can enhance quality, equity, and access, especially through community-led innovations and participatory approaches. However, a key research gap exists as most studies emphasize rural contexts, with limited attention to urban areas, highlighting the need for a more comprehensive perspective across Nepal's diverse educational settings

Methods and Materials

The study was conducted employing a qualitative research approach and descriptive research design to explore the potentialities and challenges of ICT implementation in upper-level education. Two colleges, one each from Bhaktapur and Kathmandu, were purposefully selected to portray both urban and semi-urban locations. A total of 17 participants were engaged, including two campus chiefs, two ICT subject teachers two social studies teacher, twelve students, and one key informant, all chosen through purposive sampling to ensure direct experience and relevance to ICT use in higher education. Data were gathered within seven months, from both primary and secondary sources such as academic literature, policy reports, and media analyses, which highlight both the challenges and opportunities of ICT in Nepal's education system, thereby situating the research within broader debates on quality, equity, and access.

Results and Discussion

Campus Chief's Perspectives on ICT for Higher Education

Public and community college campus chiefs were optimistic but cautious in their perceptions of the application of ICT in higher education. They both agreed in its potential to improve teaching, increase student engagement, increase access, and automate institutional processes. ICT was regarded as an innovative platform, particularly in geography instruction, where the application of digital mapping, GIS computer applications, and virtual simulation could improve spatial learning. They also stressed, however, that ICT needs to be built into pedagogy in a strategic rather than an optional technical add-on (Kozma, 2005; Selwyn, 2012). On this point one of Campus Chiefs said *"Integrating ICT in Geography education is hampered by weak*

are some resources available, weak policies and support render ICT and add-on as here opposed to a sustainable way of teaching."

Generally, when you mention opinions of several informants this type of phrase is used. You have mentioned opinion of only one campus chief's opinion, ICT as a revolution in higher education, especially in Geography through the application of GIS and simulations, but noted that poor infrastructure, weak policy, and untrained personnel make it not sustainable as an add-on but not core pedagogy.

Campus Institutional Challenges in Integrating ICT

Campus administrators cited one of the major challenges as a lack of adequate infrastructure, with the exception of some urban campuses, most colleges, and particularly urban college. ICT is not embedded in education and learning but employed as an "add-on" module in such a context. This is in agreement with Dhital (2018) that infrastructural shortages are still the biggest hindrance to the incorporation of digital learning programs in Nepal's urban college. The second challenge involves faculty readiness and training. Some of the teachers, and indeed more of the older ones, did not possess the requisite knowledge to use digital tools like Moodle and Google Classroom productively. Where training did take place, it was fragmented, too academic, and hardly related to practice in the classroom. Besides, inadequate campus-level follow-up ensured inconsistent use of ICT in the classroom. These findings support Kozma's (2005) argument that technology infusion into instruction is best achieved by the longest, practice-intensive professional development. Budgetary constraints were also mentioned as a constant problem. Most campuses had limited funds and lacked the mandate to commit finances, hence it became hard to roll out ICT infrastructure or hire qualified technical personnel. Campus Chiefs further indicated that the government support was intermittent and at times inadequate, particularly for institutions in rural and semi-urban areas. Therefore, most institutions wholly depended on community donations or local fundraising to cater for even minimal ICT costs. These are

requirements that are called for Farrell and Isaacs' (2007) discovery that in addition to sufficient funding, effective ICT development for education requires de-centralized control over funds in terms of decision-making. On this, campus chief reported, *"Students are eager and interested in using ICT in Geography, facilitating student participation and engagement." Disadvantaged and rural students, however, face inequalities of access, and it is with equal support that everyone can benefit from ICT-enabled learning.* Overall, campus leaders itemized that inadequate infrastructure, scarce funds, and the absence of faculty training prevent the implementation of ICT, which, as a result, becomes an add-on. Despite this, students are eager and active, yet rural and disadvantaged students also need equal facilitation for meaningful participation.

Student Readiness and Engagement

Irrespective of concerns over infrastructure, faculty readiness, and budget limitations, campus leaders indicated a highly strong level of digital preparedness and student interest. Undergraduate students, in particular, had greater exposure to smartphones, social networking websites, and other computer-mediated technologies and thus greater receptiveness to web-based and blended learning compared to their graduate-level counterparts. This high digital literacy among young people was seen as a solid foundation for the eventual mainstreaming of ICT in higher education. This is in line with Pew Research Center (2018), which noted that young adults in most developing countries are bound to adopt new technologies before the very institutions that are intended to assist them. In the process, the campus chief indicated that *"the COVID-19 pandemic forced ICT integration in Geography education, accelerating digital learning while revealing inequalities of access. It highlighted ICT's continuity potential and the necessity for its strategic, irreversible embedding in education."* Overall, students, especially undergrads, are digitally well-prepared, providing a sound platform for ICT in the higher education. In short, COVID-19 pandemic accelerated ICT uptake in the higher education, exposing digital readiness gaps and access inequalities.

COVID-19 as a Watershed

The COVID-19 pandemic was a watershed for ICT adoption in the higher education. It pushed the universities to hasten trials of online and blended learning but in doing so also exposed digital readiness and infrastructural capacity weaknesses. As quoted by Dhital (2021), the pandemic intensified and revealed the uneven Nepalese higher education digitalization. Particularly, non-governmental organization-funded college institutions such as OLE Nepal were in a position to raise a wake student numbers and utilize online media to get to students in remote locations, marking the kind of ICT potential that is realized when used appropriately. In this context one of the campus chief stated that the chronicled,

The COVID-19 pandemic was the game-changer for our institution. Overnight, ICT was no longer discretionary—it was the backbone of education. Geography courses that hitherto relied on field experience and material maps also had to shift into virtual space. It had its opportunities as well as challenges. Positively, it accelerated digitalization in higher education and tested the abilities of ICT to offer continuity in learning. Negatively, it exposed the digital divide among lecturers and students and the gaps in hardware, internet, and digital literacy access. The pandemic reinforced that ICT must become part of the very fabric of education, not as an emergency measure in response to a crisis.

In short, COVID-19 pandemic accelerated ICT uptake in the higher education, exposing digital readiness gaps and access inequalities.. Effective ICT utilization, as seen through NGOs, can prolong learning, and thus the necessity of its incorporation into education forever.

Recommendations for the Future

In view of the challenges and opportunities of ICT application in the higher education, a number of strategic suggestions were made by the university administrators. They advocated wider expansion of ICT infrastructure, and particularly in rural and disadvantaged areas, and suggested the creation of common regional ICT centers that can provide technical support facilities to a number of institutions. They also proposed context-sensitive open educational resources (OERs), practice-focused teacher professional development, and increased institutional autonomy to ensure maximum ICT decision-making through informed decisions. These concur with UNESCO's (2020) call for context-sensitive, inclusive, and scalable ICT solutions that address the aspirations of marginalized institutions and communities. Campus administrators agreed that although ICT has vast potential to transform Nepalese tertiary education, and geography education as a whole, its success would depend on bridging capability, infrastructure, and financial capacity system weaknesses. They were emphatic that any future work should be institution-specific and equity-oriented so that ICT integration does not widen the digital divide. Though being hopeful, the administrators also identified currently prevalent issues, such as in rural schools, such as unreliable electricity, poor internet, absence of digital equipment, low digital literacy and teaching capacity, and institutional autonomy. These have to be addressed to achieve optimal utilization of ICT as an integrated pedagogical tool and not as an "add-on" facility. The campus chief stated,

I strongly recommend that higher education institutions give priority to ICT as an integral component of Geography education. This entails capitalizing in infrastructure of a digital facility, enhancing access to equipment and internet bandwidth, and addressing professional development for teachers. We should also restructure curricula to include ICT-supported activities such as GIS mapping exercises, virtual field studies, and interactive modeling. Cooperation with government and private institutions can reinforce resource capability.

Above all, equity must be the impetus of our ICT initiative so that all students, without exception, can benefit from the utilization of ICT in Geography education. The destiny of our students—and that of tertiary education as a whole—depends on how efficiently we exploit ICT today.

Generally, University authorities recommend integrating ICT as a fundamental part of tertiary education, especially in Geography, via infrastructure development, faculty training, contextually responsive resource construction, redrafting curricula, and ensuring universal access to all students.

Perceptions of ICT Class Teachers in Higher Education

Nepali urban and semi-rural ICT teachers provided thought-provoking perceptions of using ICT in tertiary education. They knew that ICT is not another classroom pedagogical technology but a change agent in a location to improve learner interaction, interactive learning, and education coverage within Nepal's geographical diversity. Along with this, they also identified contextual barriers, such as inadequate infrastructure, no training, and asymmetric institution readiness that prevent the productive utilization of ICT. These are supported by more detailed analyses of the significance of not only possessing ICT but also utilizing it strategically to engender changes in the learning process (Kozma, 2005; Selwyn, 2012).

The Transformative Potential of ICT in Higher Education

Although most instructors envisioned the potential and revolutionary effect of ICT in the business of university education, they also witnessed infrastructural-related breakdowns of monumental proportions. In the universities in rural areas, these are even more so, with a situation where there are campuses without even projectors, non-functional computer labs, and even a stable supply of electricity. The effect is that ICT courses are usually completed through the old-fashioned chalkboard, undermining the purpose of digital learning. Problems were also reported by urban college instructors, such as old computer hardware, regular power disruptions, and slow internet. This is consistent with Dhital (2018), who further stated that inadequate infrastructure is one of the biggest hurdles to good quality digital learning in rural Nepal. Despite these constraints, ICT can still provide enhanced teaching, learning, and outreach in tertiary education, such as geography, for example, since GIS, web-based mapping, and virtual simulation can transform spatial analysis and learning. Within this context, a teacher explained, *"As a Geography teacher, I find ICT revolutionary, enabling interactive maps, simulation, and student-directed inquiry. It combines learning, creativity, and problem-solving, enabling students to succeed academically and in their career in an information age."*

In conclusion, ICT has revolutionized Geography teaching by making learning interactive and student-centered. It strengthens understanding, develops essential skills, and prepares students for academic success and future careers in a technology-driven world.

Issues with the Infrastructure

Academics, in acknowledgment of the significance of ICT in tertiary education, identified main issues with infrastructure that face the effective use of ICT. Urban school teachers bemoaned old computer hardware, constant power outages, and unstable internet connectivity. It was worse for their counterparts in urban college. They lacked computer laboratories, projectors, and a constant power supply. Consequently, ICT lessons in such college are typically conducted on chalkboards, undermining the entire point of e-learning. This is in agreement with Adhikari (2021), who quoted the lack of infrastructure as one of the major obstacles to the integration of digital learning in rural Nepal. In this way, the teacher provided evidence,

One of the greatest frustrations I face is the challenges of the deplorable state of infrastructure. Most classrooms lack stable internet, functional projectors, or updated computers. Where there is hardware, maintenance is not a priority, so we are left with equipment's that cannot be used to its full potential. The lack of ICT resources sometimes forces me to resort to traditional methods, which frustrates the full actualization of ICT in Geography instruction.

Overall, ICT is worth utilizing in tertiary education, especially for Geography, but poor infrastructure, such as outdated equipments, erratic electricity, and lack of maintenance requires the use of traditional methods, limiting its effective use and e-learning possibilities.

Faculty Preparedness and Dispositions for ICT

Staff indicated that there was a generation gap in ICT use, with younger lecturers most likely to utilize ICT such as Moodle, Zoom, and Google Classroom. On the other hand, older researchers are opposed to using ICT since they have poor digital literacy, a lack of institutional support, and a lack of motivation. Resistance is also increased by a lack of culture of innovation, particularly in rural campuses, which further discourages the use of technology. This was echoed by Kozma (2005), who stressed that teacher preparedness is an important prerequisite in ascertaining the success of ICT initiatives in universities. Likewise, the teacher stated, "*Faculty readiness for ICT integration is uneven, with some resisting due to lack of familiarity or extra effort. Ongoing training and institutional support are needed to build confidence and competence, rendering ICT a usual, effective component of teaching rather than voluntary.*" In short, a young scholar readily adopts ICT, yet older faculty opposes due to a lack of digital literacy, motivation, and support. Building confidence through training and institutional support is required for ICT to be a regular and effective aspect of teaching.

The Student Digital Divide

Although educators have noted common interest in digital technologies and extensive use of cellphones among students, they have observed a continual digital divide. Poor students, and even worse, students in rural universities do not have proper

equipment like computers, good internet, and a quiet place to study. The inequality showed its ugliest form during the COVID-19 pandemic and hit female students and students from marginal groups the hardest. These results support Dhital (2021), who identified the disproportionate impact of online learning on poor and rural students. In this regard, the teacher opined, *"There is a definite digital divide among students, with disadvantaged and rural students lacking access and ICT skills, which restricts participation and learning outcomes. It is necessary to bridge this gap in order to attain equitable benefits from the use of ICT-based education."* Briefly, there is a massive digital divide where rural, economically disadvantaged, and marginalized learners have no access to computers, the internet, and study space. This limit learning and access, requiring equalization interventions in ICT-based learning.

Institutional and Policy Gaps

The national education policies of Nepal promote the use of ICT in higher education, but in practice, its adoption at the institutional level is patchy and sporadic. From the teachers' point of view, ICT activities rely almost on individual faculty members' personal initiative or donor-sponsored short-term projects. The rural teachers mentioned a lack of ICT policies at their institutions, whereas urban teachers pointed to the necessity for greater inter-departmental coordination and resource sharing. The issues are similar to those raised by Farrell and Isaacs (2007), who stated that without institutional continuity and alignment ICT interventions never result in sustained change in educational practice. In this regard, a teacher said, *"In my experience, institutional and policy support for ICT integration is inconsistent. Although policies stress the importance of ICT, in practice there is minimal monitoring or resource allocation. Institutions lack specific guidelines on the incorporation of ICT into the curriculum. Without a stable policy framework, ICT remains underutilized, and lecturers such as myself must manage with little support."* In conclusion, although national policies support ICT in higher education, institutional practice remains uneven. Lack of proper clear guidelines, coordination, and resources see teachers handling ICT on their own, precluding its coherent integration and long-term impact on teaching practice.

Recommendations for Improvement

Both ICT faculty members offered some practical suggestions to surmount the existing problems in higher education, drawing upon their experience. They stressed subject-specific, structured ICT capacity-building programs grounded in the needs of the faculty and enhanced ICT infrastructure with priority to rural campuses. They also recommended sending technical experts to facilitate online learning and debug digital issues, and the development of digital content at the national level in Nepali to enhance inclusivity. They also suggested initiating government-funded models of blended learning that utilize online and offline learning, and incentives to permit creativity and appropriate implementation of ICT in education. These are in agreement with UNESCO (2020) in the view that teacher-centered, context-sensitive, and inclusive multilateral digital learning policies need to be implemented. In these matters, an educator

expressed, "*Institutions have to invest in infrastructure, reliable internet, modernized labs, and technical support, and provide continuous training for teachers and students. Curriculum change and incentives for successful ICT implementation can promote integration of digital activities in Geography education.*" Lastly, ICT staff recommends upgrading infrastructure, providing ongoing training, developing local digital content, adopting blended learning, and providing incentives to enable inclusive, teacher-led, and effective integration of ICT in Geography and higher education.

Prospects of ICT

Educationalists, administrators, and students in Nepal view ICT in higher education with cautious optimism. They believe ICT can reduce learning disparities and improve outcomes but with the assistance of governmental policies, instructor training, and institutional planning. There remain issues, however, including the absence of infrastructure in rural areas, low budgets, low digital literacy among the staff, and unequal access by vulnerable groups of students. The COVID-19 pandemic hastened ICT adoption but also highlighted systemic vulnerabilities whereas students are motivated and younger staff learn ICT effortlessly, older staff is not skilled and supported. Existing ICT adoption is intermittent, donor-dependent, and much of an add-on rather than an integral pedagogical tool. Investment in strategic infrastructure, local content creation, teacher capacity building, and regular technical assistance has to be made so that ICT is usable for inclusive, scalable, and interactive education in Nepal. In this context, the teacher believed that "*the future of ICT in Geography education is promising. ICT tools like GIS, Google Earth, and virtual reality enhance learning, critical thinking, and digital literacy, but accessibility, sustainability, and proper training are essential.*" Overall, ICT in Nepalese universities, specifically Geography, is poised to enhance learning, critical thinking, and digital literacy. Inadequate infrastructure, low investment, poor staff capacity, and unequal access are, however, constraints to its effective, sustainable, and equitable integration.

Students' Attitudes towards ICT and its Importance

ICT is found to be extremely important to both rural community college students and urban public college students for their work environment as well as for the growth of their country. The environment concurs with broader literature highlighting ICT potential for transforming education, particularly in the Third World, where internet literacy continues to spur socio-economic development (UNESCO, 2022; World Bank, 2020). Though aware of its importance, students complain their learning environment hardly include effective and budget-friendly ICT training. There is mostly typical of lessons full of theory, with little experience of actual ICT tool and platform use, e.g., Google Classroom, Zoom, and Learning Management Systems—a trend which is more common in rural areas. These remarks validate Karki and Pant (2020), who remarked that ICT teaching in Nepal is behind practice training as well as not fully merged with everyday practice. Here a student remarked, "*As students, we find ICT makes Geography interesting and relevant. Digital maps, satellite images, and digital*

resources make complicated things simpler, making ICT crucial for learning, academic development, and prospects, without which Geography feels incomplete." In short, students acknowledge ICT as fundamental to learning, work, and national development, but decry education being largely theoretical with little practical training, especially in rural areas. They stress ICT makes Geography interesting and beneficial for college and the future application.

Infrastructural Shortfalls and the Rural-Urban Divide

Infrastructural shortages are both common among urban and rural college in Nepal, albeit more frequently in rural colleges. Rural university students report some of the most important gaps in electronic infrastructure as irregular power supply, lack of computer laboratories, and unpredictable internet connectivity. Even though the urban experience a similar set of issues like outdated and few practical exercises, it is comparatively less severe. This is underpinned by previous research conducted by Adhikari (2021) and Gurung and Parajuli (2021), which reported the prevailing digital divide in Nepal, where rural colleges and schools are far less technologically advanced than those from urban areas. The economic divide further expands the gap since most students do not have the capacity to afford personal devices or mobile data fees (Ghimire & Aryal, 2019). Therefore, the student complained, *"Because I am from a rural background, I often face difficulties in ICT facility access. The internet is slow, old computers, and electricity itself is sometimes not reliable. When I compare my situation with my urban campus colleagues, I feel disadvantaged. This rural-urban dichotomy undermines our confidence in ICT-based work, and we believe it will affect our career aspirations in the future."* Total ICT is viewed as crucial by rural community college students as well as urban public college students for their employers and for the development of their country. The setting concurs with wider literature that foregrounds ICT learning potentiality for transformation, particularly in the Third World, where internet literacy continues to propel socio-economic development (World Bank, 2020; UNESCO, 2022). Students complain even when they know its importance that their learning environment hardly integrates valuable and accessible ICT training. Theirs is dominated mainly by theory-loaded classes with less exposure to practice application of ICT tools and platforms, such as Google Classroom, Zoom, and Learning Management Systems—a trend prevalent more in villages. These remarks agree with Karki and Pant (2020), who also noted that ICT instruction in Nepal is still behind practice-based training and also is not entirely an integral part of routine practice. According to a student, *"For us as students, we think ICT makes Geography come alive and meaningful. Satellite images, digital maps, and online information make complex topics easy to comprehend, thus making ICT a learning necessity, academic progress, and career opportunities, without which Geography is not complete."* Overall Students recognize ICT as an essential tool for educational learning, professional employment, and national development, but practical training is limited, especially in rural universities. In Geography, computer facilities promote involvement and understanding, reflecting the need for practical, convergent ICT training.

Pedagogical Restraints and Faculty Shortfalls

Most teaching is theoretical, with minimal student-teacher interaction, and minimal exposure to industry experience or applied projects. Trainers are largely not computer literate, and no training is provided on how to incorporate ICT into class. These problems reflect broader ICT integration criticism in tertiary learning. Shrestha (2021) describes how despite national policy plans like Nepal's ICT in Education Master Plan (2013–2017) making teacher training a priority, implementation at an institutional level has been gradual and patchy. The staff are not provided the support, the infrastructure, or the incentives that they require to optimize their own digital pedagogic capacity (Pokhrel & Chhetri, 2021). To this purpose, the student submitted, *"Even if ICT facilities are available, teachers prefer to continue with traditional lecturing or use PowerPoint only. Teacher training with ICT techniques must increase to make learning interactive, as students lack knowledge of how to operate ICT effectively without instruction."* Overall, the majority of the education in Nepal's tertiary education is theoretical with little practice and untrained teachers utilizing digital technology. Despite national policies, ICT integration is not consistent and thus training of the teachers has become crucial to enable interactive and efficient learning among students.

Student Aspirations and Personal Development

Students demonstrate agency and optimism in being capable of managing ICT learning challenges despite institutional constraints. They complement outside resources on their own, learn from one another, and use free web-based learning resources to bridge knowledge gaps. Under conditions of minimal formal infrastructure and assistance, these non-curricular activities demonstrate learners' capacity and resourcefulness for self-directed learning (Tadesse & Gillies, 2015). Further, students are not merely passive ICT recipients but also provide pragmatic recommendations on how to enhance learning outcomes. They include: digital infrastructure building, designing inclusive and localized ICT curricula, partnership with industry, and staff professional development. This student feedback suggests the necessity of bottom-up perspectives in informing sound ICT practice and molding education policy. In this case, a student *reported*,

ICT gives us a sense of empowerment. It makes us learn to operate GIS, online mapping tools, and digital materials. It not only makes us effective in Geography but also ready for a professional life and higher studies. It makes us creative, able to solve problems easily, and confident. We believe ICT is a bridge of book learning and real practice, and it allows us to think beyond books.

In conclusion, ICT empowers learners by building technical skills and connecting theory with real-life application. It enhances creativity, confidence, and problem-solving while preparing students for higher studies and professional careers, making learning more practical and meaningful beyond textbooks.

Differences in the Practice of ICT

Nepal has also developed country-level ICT policies, such as the School Education Support Program (2016–2023) and Digital Nepal Framework (2019), to enable digital learning but campus-level adoption is in its nascent stages. National policy agenda-local adoption mismatch is another widespread phenomenon in higher education. Development agencies worldwide have experienced the same extent of mismatch between policy intent and ground realities. For example, the Asian Development Bank (2020) finds that poor coordination, poor local ownership, and absence of monitoring facilities are disincentives to Nepal's ICT goal attainment. Student experiences on urban and rural campuses reflect mutual consciousness of ICT capability but also enormous differences in access and quality. Rural students, more than any others, are confronted with severe infrastructure constraints, fiscal challenges, and low faculty preparedness, thereby ICT education in such environments is usually ineffective. Such types of student enthusiasm and active learning methods, however, hold promise for transformation. Closing the rural-urban digital divide is not just about technology investment; it is about structural changes in the form of inclusive curriculum design, local digital content, quality teacher training, and robust academia-industry interfaces. Without these, ICT shall become an unfulfilled promise in Nepal's dream of transforming higher education. In this context, a student remarked, *"Students observe major differences in ICT use across classes. Some teachers prefer using interactive tools while others employ slides only. This inconsistency generates uneven competencies. Equal ICT application is required for equal learning opportunities."* In conclusion, we observe inconsistent ICT practice in institutions: some teachers use online platforms, projects, and mapping tools while others employ just slides. The difference generates wide skill gaps; equal ICT practices are required for equal learning opportunities.

Conclusion

There is unmatched transforming ICT potential in Nepali higher education and more specifically in geography education in terms of enhanced spatial literacy, collaborative learning, and research skill transfer. Students are disadvantaged in terms of infrastructure and structurally disadvantaged by socio-economic constraints. Teacher capacity, availability of resources, and infrastructure, all of which discourage unproblematic integration of ICT, especially in the rural settings. The COVID-19 pandemic highlighted underlying inequalities and accentuated ways in which ICT was able to enable increased access and learning continuity—University managers, ICT educators, and students all agreed that ICT is able to deliver access, teaching, and learning. But recurring problems—unreliable connections, power outages, poor-quality connections, outdated equipment, and poor-quality technical supports—causes barriers to take-up, worst on rural campuses. Staff development is in most cases inadequate, with the knowledge, training, or enthusiasm of teachers to utilize ICT in the classroom nowhere near optimal. Financial and managerial challenges, such as unpredictable state

budgets and restricted autonomy to hire technical staff, further hinder development. The students are IT literate, but spatial and economic disparities continue to push the digital divide higher, restricting access to hardware, connectivity, and hands-on training. ICT training is predominantly theoretical with limited exposure to shop work, internship, and industry liaison. Yet, the COVID-19 pandemic accelerated integration of ICT, highlighting its significance in maintaining education alive. The recommendations of the stakeholders are strategic investment in infrastructure, particularly on rural campuses, occasional context-specific faculty development, content development and dissemination localized digital, and setup of public ICT support centers and technical networks. Master ICT policies and campus master plans with long-term, inclusive, and context-sensitive institutional reforms have the ability to overcome the urban–rural digital divide. Through collective efforts on the part of the government, institutions, and society, ICT has the ability to re-engineer higher education in Nepal to equip students with the competencies for national development and the uncertainties of the world.

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