Status and Application of Information and Communication Technology (ICT) in Barun Multiple Campus (BMC), Khandbari

Mr. Rudra Nath Dahal

Ph.D. Scholar, Prince of Songkla University, Thailand,
Lecturer (Sociology/Education), Research Coordinator, Planning and Research Management
Committee (PRMC), Barun Multiple Campus. Khandbari
Email: dahalrudra18@gmail.com
DOI: https://doi.org/10.3126/barunj.v2i01.78338
ORCID ID: 0009-0009-8693-5408

ABSTRACT

This chapter provides an overview of the Status and Application of Information and Communication Technology (ICT) at Barun Multiple Campus (BMC), Khandbari. With the rapid advancements in technology. integrating ICT into education and administration has become essential for enhancing teaching quality. streamlining administrative tasks, and developing a modern educational environment. Barun Multiple Campus, located in a rural region of Nepal, has been making efforts to incorporate ICT into its academic framework. though challenges persist in terms of infrastructure and digital literacy. Barun Multiple Campus, a community-based institution in the eastern region of Nepal. acknowledges the growing importance of ICT in the educational sector. Given its rural location and resource limitations, the institution has faced barriers in fully leveraging technology for education. This chapter aims to evaluate the status of ICT at BMC and analyze its application in various academic and administrative domains. This study aims to evaluate the current state of ICT infrastructure and resources at BMC, assess the implementation and use of ICT in teaching and learning. investigate how ICT is applied in administrative activities, understand the level of ICT skills among faculty members and students, identify barriers to the effective adoption of ICT, and offer recommendations for enhancing ICT integration. The research follows a descriptive study design, collecting both qualitative and quantitative data. A combination of surveys, interviews, and document analysis was used. Questionnaires were distributed to the faculty, staff, and students,

while interviews with administrative personnel provided additional insights into the ICT challenges and practices, Document reviews of campus policies and ICT-related resources were conducted to understand the institutional approach towards technology integration. The basic ICT infrastructure is in place but insufficient to fully support all educational and administrative activities, while some faculties incorporate ICT in teaching. there is a need for further training and resources, and limited internet bandwidth, along with a lack of advanced ICT tools, hinders further progress. Although BMC has made strides in incorporating ICT. further investments and strategic planning are crucial for overcoming existing challenges and ensuring the effective use of ICT for educational and administrative advancement. This chapter concludes with recommendations for improving ICT infrastructure. increasing faculty training, and expanding the ICT curriculum.

Keywords: *information and communication technology (ICT), digital learning. ICT infrastructure, higher education, ICT challenges, smart campus*

INTRODUCTION

Background of the Study

In the rapidly evolving digital era, Information and Communication Technology (ICT) has become an essential pillar in modern education systems, enabling new methods of teaching, learning, and institutional management (Selwyn, 2012). The strategic integration of ICT is especially significant for institutions like Barun Multiple Campus (BMC) in Khandbari, Nepal, as it seeks to enhance both academic quality and operational efficiency. ICT not only offers flexible access to learning resources but also fosters collaboration and innovation among students and faculty (Sangrà et al., 2012). Despite its growing global significance, the adoption of ICT in Nepalese higher education, especially in community campuses, has been slow and inconsistent due to infrastructural, financial, and policy limitations (Kunwar, 2020; UNESCO, 2011). The Government of Nepal has acknowledged the role of ICT in promoting equitable and quality education, as reflected in its *School Sector Development Plan 2016–2023* (Ministry of Education, Science and Technology [MoEST], 2019). However, campuses like BMC still face challenges in ICT infrastructure, internet reliability, and faculty digital readiness. This scenario reflects a common struggle across developing nations, where the digital divide hampers the full utilization of ICT tools in academic environments (OECD, 2015; World Bank, 2018). A study by Kozma (2008) emphasizes the importance of national policies that align ICT integration with educational goals. However, BMC's context mirrors a gap between policy and practice,

where ICT remains underutilized despite its inclusion in national frameworks. Data from the Nepal Telecommunications Authority (2022) show a substantial growth in digital connectivity in urban centres, but rural academic institutions continue to lag behind in consistent, high-speed internet access. Alam (2016) also highlights that the mere availability of ICT tools does not automatically lead to improved educational outcomes unless there is substantial institutional commitment and teacher training.

In the context of the COVID-19 pandemic, the role of ICT in education became even more pronounced, as distance learning and digital classrooms became a necessity rather than an option (Amidst COVID-19, 2021). For BMC, the pandemic revealed both the potential and the limitations of its digital infrastructure. According to the World Bank (2018), digital transformation in Nepal is still in its formative stages, which directly affects institutions like BMC when attempting to implement modern ICT-based educational practices. Therefore, examining the status and application of ICT at BMC is not only timely but also necessary for identifying gaps, refining policies, and proposing targeted solutions to strengthen the campus's capacity for digital education. Information and Communication Technology (ICT) has emerged as a pivotal tool for enhancing the efficiency and effectiveness of education globally. Integrating ICT into academia not only fosters a more dynamic and interactive learning environment but also prepares students to excel in an increasingly technology-driven world. The proliferation of ICT in education aims to address challenges such as limited access to educational resources, outdated pedagogies, and the need for modernized learning methodologies. This research investigates the status and application of ICT at Barun Multiple Campus (BMC), Khandbari, as part of its commitment to aligning with these global trends.

Barun Multiple Campus (BMC), a community campus affiliated with Tribhuvan University, is situated in Khandbari Municipality Ward No. 8, Sankhuwasabha district, Koshi province, Nepal. Established with the vision of providing accessible, affordable, and quality education to students in remote areas, BMC has become a vital educational institution in the region. It offers a range of academic programs, including Bachelor's in Humanities and Social Sciences, Education, and Management, alongside Master's programs in Education with specializations in English, Nepali, Health, and Educational Planning and Management (EPM). Additionally, since 2051 B.S., the campus has been running a +2 program for class 11 and 12. Currently, BMC serves over 1,000 students, predominantly from economically disadvantaged and backward communities, reflecting its commitment to inclusive education (Barun Darpan, 2024).

ICT infrastructure and utilization at Barun Multiple Campus are critical for meeting the needs of its diverse student population. The campus has recognized this importance by proposing several ICT initiatives, such as enhancing computer networks, adding smart classroom technologies, and expanding internet connectivity. These initiatives aim to provide comprehensive learning opportunities while bridging the digital divide in rural Nepal. Furthermore, planned ICT activities include launching B.Ed. ICT classes, offering computer science courses for +2 management students, and introducing Tribhuvan University-certified ICT training programs (Barun Darpan, 2024). Despite these efforts, BMC faces challenges such as limited infrastructure, insufficient trained faculty, and inadequate resources. This study seeks to explore the current status of ICT at BMC, evaluate its implementation in teaching and administration, and propose recommendations for its optimal utilization. By doing so, the research will contribute to the campus's ongoing efforts to integrate ICT into its educational framework and improve overall institutional performance.

Statement of the Problem

The integration of Information and Communication Technology (ICT) into education has become essential for fostering innovation, improving learning outcomes, and ensuring equitable access to resources. However, at Barun Multiple Campus (BMC), the adoption and application of ICT face significant barriers, such as limited technological infrastructure, lack of trained personnel, and resource constraints. These limitations hinder the effective utilization of ICT in teaching, learning, and administrative processes. Moreover, understanding the current status of ICT implementation and identifying gaps in its application are crucial for developing strategie interventions. Thus, the problem addressed by this research is: "What is the current status of ICT infrastructure and its application at Barun Multiple Campus, and how can it be enhanced to support academic and administrative functions?"

Objectives of the Study

• To assess the current status of ICT infrastructure and resources within Sankhuwasabha and at Barun Multiple Campus.

• To evaluate the ICT status of students and application of ICT in teaching, learning, and administrative practices at the campus.

• To propose strategies for improving the integration and utilization of ICT in the campus's educational and operational frameworks.

- To explore recommendations for utilizing smart digitization technologies to enhance campus management, administration, teaching, learning, research, and student services.

Significance of the Study

This study on the status and application of Information and Communication Technology (ICT) at Barun Multiple Campus (BMC). Khandbari, holds significant academic, institutional, and policy implications. It provides valuable insights into the current ICT infrastructure, its utilization in teaching-learning processes, and administrative efficiency. Understanding the existing ICT landscape at BMC will help campus management and policymakers identify strengths and gaps, facilitating data-driven decision-making for future investments in digital resources. This research is particularly beneficial for faculty members and students, as it highlights the role of ICT in enhancing learning experiences, fostering digital literacy, and improving academic outcomes. Additionally, the findings can contribute to institutional development by recommending strategies to optimize ICT integration, ensuring equitable access to digital tools. The study also serves as a reference for other community campuses facing similar challenges, promoting best practices in ICT adoption for higher education in Nepal.

RESEARCH METHODOLOGY

The methodology employed in the study of the status and application of Information and Communication Technology (ICT) at Barun Multiple Campus utilizes a mixed-methods approach, combining both quantitative and qualitative techniques. This design enables the research to collect measurable data related to ICT infrastructure and usage while also gaining in-depth insights from key stakeholders such as faculty, students, administrators, parents, and donors. Quantitative methods are used to assess the availability and use of ICT resources, while qualitative methods explore experiences, challenges, and suggestions for ICT improvement.

The research targets a diverse population that includes students from all academic levels, faculty and administrative staff, members of the Campus Management Committee (CMC), parents, donors, and telecom resource persons. Stratified sampling is used to ensure balanced student representation, while purposive sampling is applied for selecting individuals with specific roles and insights. The expected sample size ranges from 30 to 150 students, 15 to 25 faculty/staff, 5 to 7 CMC members, 10 to 15 parents, and 2 to 3 donors and telecom experts.

Multiple data collection methods are adopted, including direct observation of ICT infrastructure and digital resources, structured surveys for students, focus group discussions (FGDs) with faculty and staff, and semi-structured interviews with stakeholders. These tools help gather data on ICT access, usage behavior, user satisfaction, and institutional perspectives. Observational checklists and Likert-scale survey questionnaires are employed, along with open-ended guides for FGDs and interviews.

For data analysis, descriptive statistics are applied to summarize the quantitative data, while thematic analysis is conducted on qualitative responses to identify patterns and recurring themes. Direct quotes from participants enhance the richness of qualitative findings. The results are visually represented using tables, bar diagrams, and pie charts to make the data more accessible and interpretable. Tables summarize usage patterns, bar diagrams compare ICT use across groups, and pie charts show the proportional distribution of resources and satisfaction levels.

Ethical considerations are carefully addressed through informed consent, confidentiality of responses, and compliance with ethical guidelines set by Barun Multiple Campus and Tribhuvan University. However, the study acknowledges limitations such as the possible non-availability or unwillingness of respondents and the evolving nature of ICT, which may affect the findings. Despite these challenges, the methodology is structured to provide a reliable and holistic evaluation of ICT practices and inform strategic improvements at the campus.

RESULT AND DISCUSSION

ICT and Internet Status in Khandbari and Sankhuwasabha

Sankhuwasabha district in eastern Nepal has witnessed significant strides in Information and Communication Technology (ICT) infrastructure development in recent years. This has led to improved connectivity, facilitated communication, and contributed to socio-economic development.

Internet Services:

Availability: Three primary internet service providers cater to the district: Fiber-to-the-Home (FTTH), Asymmetric Digital Subscriber Line (ADSL), and 4G wireless routers.

Capacity: FTTH connections offer high-speed internet ranging from 50 Mbps to 1 Gbps. providing robust bandwidth for residential and commercial use. Leased lines

cater to businesses and institutions with bandwidth requirements ranging from 2 Mbps to 100 Mbps.

Coverage: FTTH services are widely available in major towns like Khandbari. Tumlingtar, Manebhanjyang, and Chainpur. Expansion is ongoing in areas like Chewa. Arunthan. Sekaha. Panchkhapan, and Barhabise.

Mobile Network Infrastructure:

Tower Deployment: A total of 31 towers (2G and 4G) are strategically located throughout the district, ensuring widespread coverage.

Table 1: *Distribution*

SN	Municipality	Towers no.	SN	Municipality	Towers no.
1	Dharmadevi	3 towers	6	Sabhapokhari	2 towers
2	Madi	2 towers	7	Chichila	3 towers
3	Chainpur	3 towers	8	Makalu	6 towers
4	Khandbari	5 towers	9	Silichong	1 tower (with 1 under construction)
5	Panchkhapan	2 towers	10	Silichong	2 towers (with 2 under construction)

Source: Nepal Telecom, Khandbari

The expansion of network coverage across the district has significantly improved, with most areas now having access to basic telecommunications infrastructure. However, some remote regions still face connectivity issues due to difficult geography and sparse population, limiting the reach and reliability of network services in those zones.

In terms of service provision, the district has recorded notable progress. By the fiscal year 2080 (2023/2024), there were 151 post-paid and 4,200 prepaid mobile SIM card users. Fiber-to-the-home (FTTH) services were also growing, with 151 new connections established and 365 existing PSTN lines successfully migrated to FTTH. Additionally, 50 households subscribed to NTTV services bundled with internet access. To extend connectivity to hard-to-reach locations, 71 Namaste Wireless Routers were distributed in Bhotkhola, Makalu, and remote areas of Bhojpur district. In a move to support education, 21 free mobile SIM cards were distributed to students who had completed their Secondary Education Examination (SEE). Network modernization efforts included migrating 240 Sky Phone exchanges

from DMA to GSM technology, enhancing service quality. For internet users, 12 WHBB SIM cards were issued, bundled with affordable NRS.90 recharge and 60GB data packages priced at NRS.800.

Despite these advances, several challenges persist. Solar-powered communication towers, while eco-friendly, are susceptible to outages during the rainy season due to insufficient sunlight. Additionally, unstable electricity supply in remote areas continues to affect network uptime. Another ongoing issue is the delay in maintenance work, which hampers consistent and reliable service delivery, especially in isolated regions. Addressing these challenges is critical to achieving more inclusive and dependable connectivity across the district.

Table 2: *Key ICT and Internet Statistics in Sankhuwasabha (2080)*

SN	Particular	Number
1	Postpaid Mobile SIM Card	151
2	Prepaid Mobile SIM Cards	4200
3	FTTH New Connection	151
4	PSTN Migration to NT Fiver	365
5	NTTV with Internet	50
6	Namaste Wireless Router Distributed to Bhotkhola, Makalu and Remote Places of Bhojpur	71
7	Free Mobile Sims Distributed after SEE Students	21
8	Sky Phone Exchange (DMA to GSM Migration)	240
9	WHBB SIM Card for Internet Users in NRS.90 and 60GB Data Pack in NRS.800	12

Source: Nepal Telecom, Khandbari

Table 3: *Abbreviations*

SN	Abb.	Full Form	SN	Abb.	Full Form
1	DMA	Digital Multimedia Broadcasting	6	WHBB	Wireless Home Broadband
2	SIM	Subscriber Identity Module	7	PSTN	Public Switched Telephone Network
3	MB	Megabyte	8	GB	Gigabyte
4	ADSL	Asymmetric Digital Subscriber Line	9	MBPS	Megabits per second

SN	Abb.	Full Form	SN	Abb.	Full Form
5	FTTH	Fiber-to-the-Home	10	GSM	Global System for Mobile Communications

Source: Nepal Telecom, Khandbari

Sankhuwasabha has made significant strides in improving ICT infrastructure and internet connectivity. However, while network coverage has reached some areas in Makalu, Bhotkhola. and Sabhapokhari rural municipalities, challenges remain. Remote locations with low population density often lack adequate coverage. Additionally, network outages are a recurring issue. Solar-powered towers experience interruptions during the rainy season due to insufficient sunlight, and unstable electricity supply in remote areas further disrupts network connectivity.

Barun Multiple Campus

Barun Multiple Campus (BMC) was established in 1986 as a community-based, non-profit institution in Khandbari, Sankhuwasabha. Situated in a scenic location overlooking the Makalu range. BMC offers a range of programs, including 2. Bachelor's degrees in Humanities. Social Sciences, Management, and Education, and a Master's in Education. Founded through the collective efforts of the community. BMC aims to provide accessible and affordable quality education to students from remote areas. With a focus on inclusivity, it encourages the participation of female and minority students. Currently, the campus has 918 students and employs 29 faculty members and 6 staff.

BMC's vision is to achieve national recognition for its academic excellence and its role in developing professional and community leaders. Its mission emphasizes producing skilled professionals through scholarly and research-oriented activities. Key goals include financial sustainability, improved infrastructure, and a conductive learning environment.

Table No 4: *Students Number in Barun*

SN	Faculty/Programs	Level/Semester				Total
		11/1st/Sem	12/2nd/Sem	3rd/Sem	4th/Sem	
1	+2 (Higher Secondary)	153	209	-	-	362
2	B.A.	14	15	13	05	47
3	B.Ed.	94	83	79	52	308

4	BBS	48	48	43	23	162
5	M.Ed.	14	14	05	06	39
	Total	323	369	140	86	918

Source: Barun Darpan, 2080/81

Table 5: *ICT Infrastructures of Barun Multiple Campus*

Category	Items	Quantity	Notes
Hardware	Computers (Desktops) - Running	8	Consider specifications: RAM, storage, processor
	Computer (Laptops)		
	Printers (Laser)	3	Ensure compatibility with operating systems
	Printer (Inject)	1	
	Printer (Dot Matrix)	1	Ensure compatibility with operating systems
	Photocopier		
Hardware	Multimedia Projectors	3	High-brightness, good resolution for presentations
	Smart TVs	7	For engaging classroom activities
	Scanners	1	For digitizing documents and images
	Solar Energy (Uninterruptible Power Supply)	3200 Watt	To protect equipment during power outages
	Teacher Mice	2	To teach large number of students
	Router	2	For internet connectivity and network management
	Surveillance System (CCTV)	8	Security System
	Speakers with Microphones	2	For individual use or group activities

| Category	Items	Quantity	Notes
Software	'Shiksha' Software	With Licenses	Operating System
	Antivirus Software	With Licenses	To protect computers from malware
	Video Conferencing Software (Google Meet)	Free of Use	For online meetings and classes
Peripherals	USB Drives	16 GB-16	For data storage and transfer
	External Hard Drives	2	For data backup and storage

Source: EMIS Section, Barun Multiple Campus

ICT Status of Students and Application

ICT Concept and Use of Mobile/Computer

Table 6

SN	Indicators/Level	11/12 100%	B.Ed. 100%	BBS 100%	M.Ed. 100%
1	Clear Concept of ICT	86.66	100	100	88.88
2	No Clear Concept of ICT	13.33	-	-	11.11
3	Own Apple Mobile Phone	3.33	10	-	11.11
4	Own Smart Mobile Phone	56.66	70	80	55.55
5	Own Basic Mobile Phone	30	20	20	22.22
6	Not Any Mobile Phone	18	-	-	-
7	Own Personal Laptop Computer	-	10	20	50
8	Own Personal Desktop Computer	-	-	-	-
9	Not Any Personal Computer	100	90	80	50

Source: Survey, 2080/81

Figure 1 ICT Concept and Use of Mobile/Computer
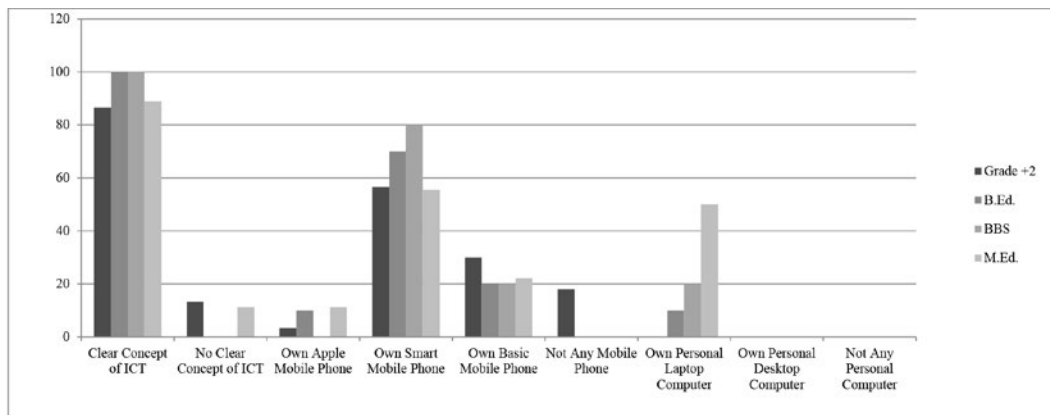
Source: Survey, 208081

The data reveals the ICT concepts and use of mobile and computer devices among students across all levels. While most students have a clear concept of ICT (86.66% in 11/12 and 100% in B.Ed. and BBS), a small percentage in 11/12 and M.Ed. still lack clarity (13.33% and 11.11%, respectively). Smart mobile phones are widely owned, particularly by BBS students (80%), while basic phones are more common among 11/12 students (30%). The absence of mobile phones is notable in 11/12 (18%) but absent in other levels. Ownership of personal laptops is minimal in lower levels but rises to 50% in M.Ed., while desktop ownership is non-existent across levels. A majority lack access to any personal computer, particularly in lower levels like 11/12 (100%) and B.Ed. (90%). These findings suggest the need for improved access to ICT devices, particularly for 11/12 and B.Ed. students, to bridge the digital divide.
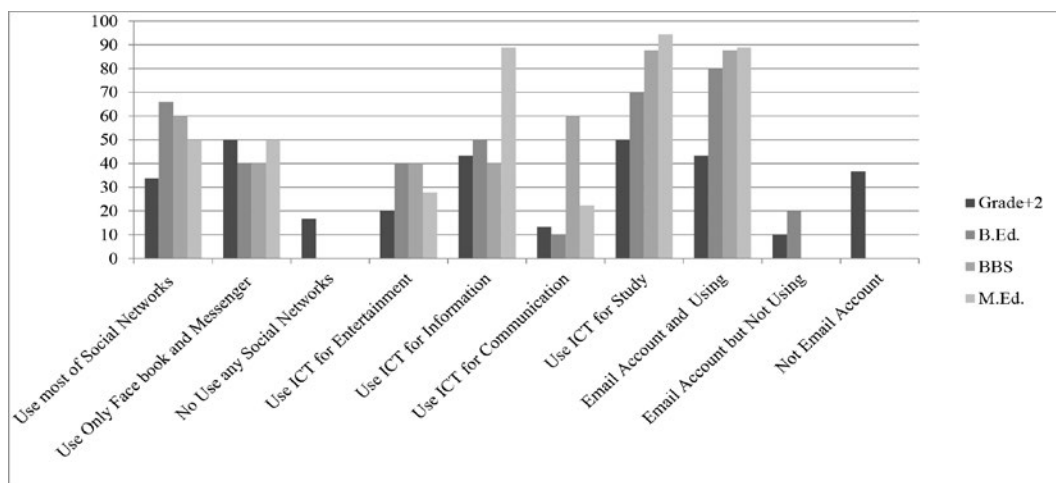
Use of ICT and Social Networks

Table 7: *Use of ICT and Social Networks*

SN	Indicators/Level	11/12 100%	B.Ed. 100%	BBS 100%	M.Ed. 100%
1	Use most of Social Networks	33.33	66	60	50
2	Use Only Face book and Messenger	50	40	40	50
3	No Use any Social Networks	16.66	-	-	-
4	Use ICT for Entertainment	20	40	40	27.77
5	Use ICT for Information	43.33	50	40	88.88

SN	Indicators/Level	11/12 100%	B.Ed. 100%	BBS 100%	M.Ed. 100%
6	Use ICT for Communication	13.33	10	60	22.22
7	Use ICT for Study	50	70	87.7	94.44
8	Email Account and Using	43.33	80	87.7	88.88
9	Email Account but Not Using	10	20	-	-
10	Not Email Account	36.66	-	-	-

Source: Survey, 2080/81

Figure 2 Use of ICT and Social Networks

Source: Survey, 2080/81

The data highlights ICT and social network usage across educational levels. A significant percentage of students use multiple social networks (66% in B.Ed. and 60% in BBS), though a notable portion in 11/12 relies only on Facebook and Messenger (50%), ICT is primarily used for information gathering (88.88% in M.Ed.) and study purposes (notably high at 94.44% in M.Ed.). with lower usage for entertainment and communication. Email account usage is prominent in higher education levels (88.88% in M.Ed. and 87.7% in BBS), but a significant proportion in 11/12 either do not use email (36.66%) or underutilize it (10%). These findings suggest the importance of expanding ICT literacy, particularly among 11/12 students, and diversifying its applications beyond study and entertainment.

Use of Internet Facility

Table 8: *Use of Internet Facility*

SN	Indicators/Level	11/12 100%	B.Ed. 100%	BBS 100%	M.Ed. 100%
1	Use FTTH	53.33	60	60	27.77
2	Use Mobile Data	40	40	40	72.22
3	Good Speed of Internet	33.33	30	40	16.66
4	Poor and Unstable Speed of Internet	56.66	60	60	88.88
5	No Free Internet Facility in Campus	76.66	50	80	16.66
6	Free Internet Facility in Campus	26.66	40	20	16.66
7	No Connected E-Library	66.66	70	60	77.77
8	Connected E-Library and Using	20	20	20	27.77
9	Connected E-Library but not Using	10	10	-	-
10	Using Mobile Banking	16.66	40	60	94.44
11	Unknown of Mobile Banking	83.33	60	40	5.55

Source: Survey, 2080/81

**Figure 3 Use of Internet Facility**
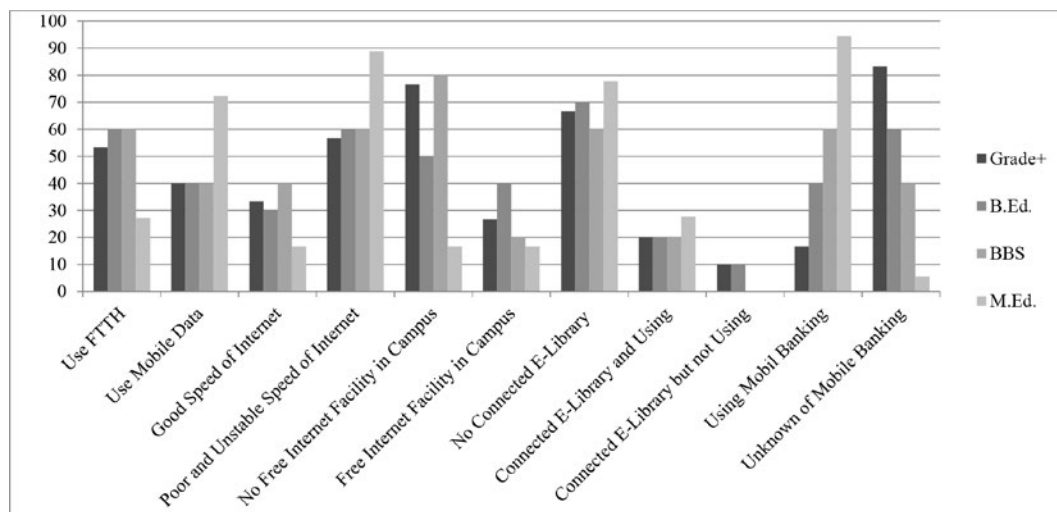
Source: Survey, 2080/81

The data reveals insights into internet usage across different educational levels. While all levels utilize the internet. FTTH and mobile data are the primary access modes, with higher mobile data usage in M.Ed. (72.22%). Internet speed is a major challenge, as most students report poor and unstable connections (highest at 88.88% in M.Ed.) Free internet facility in the campus is limited, with low usage (26.66% in 11/12 and 16.66 in M.Ed.), and e-library connectivity and usage remain underutilized, with many either not connected or not using the resource. Mobile banking is widely used in M.Ed. (94,44%) but significantly less in 11/12 (16.66%). where awareness is minimal. These trends emphasize the need for enhanced campus imenet services, promotion of digital literacy, and improved e-library access.

ICT Training, Connect to Study and Teaching Learning

Table 9: *ICT Training, Connect to Study and Teaching Learning*

SN	Indicators/Level	11/12 100%	B.Ed. 100%	BBS 100%	M.Ed. 100%
1	School Level ICT Education	36.66	20	-	11.11
2	Basic Level ICT Training	23.33	30	20	44.44
3	Diploma Level ICT Training	23.33	40	80	22.22
4	Advanced Level ICT Training	-	10	-	16.66
5	No ICT Education or Training	16.66	-	-	5.55
6	Watch Violence/Sex Site	30	10	60	38.88
7	More Teachers Connect ICT	20	10	20	-
8	Less Teachers Connect ICT	46.66	60	80	77.77
9	No Teachers Connect ICT	36.66	30	-	22.22
10	More Teachers Use ICT Tools	16.66	20	40	-
11	Less Teachers Use ICT Tools	26.66	40	60	72.22
12	No Teachers Use ICT Tools	50	40	-	27.77

Source: Survey, 2080/81

Figure No. 4. ICT Training, Connect to Study and Teaching Learning
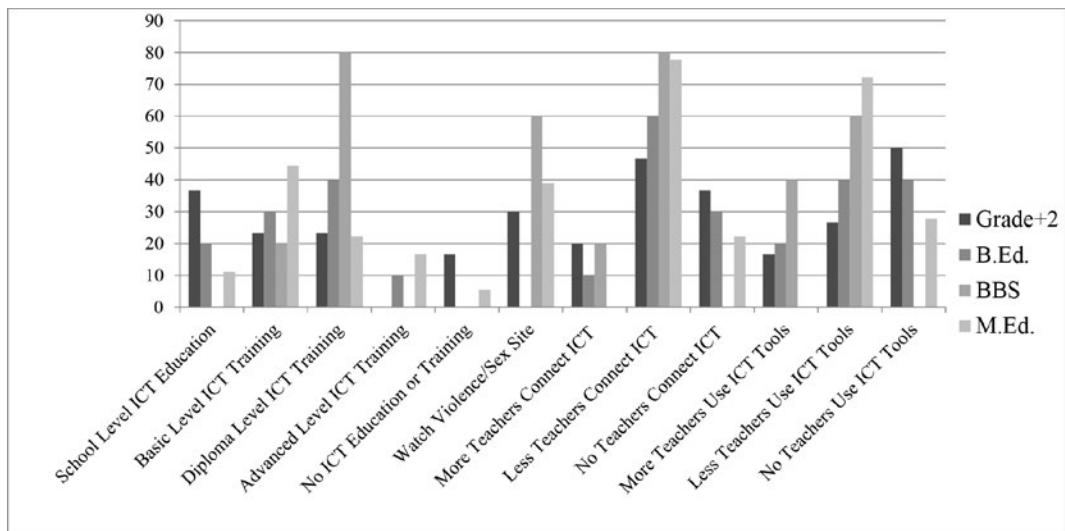
Source: Survey, 2080/81

The data highlights varied ICT training and integration into teaching and learning across educational levels. A significant portion of students (36.66% in 11/12 and 20% in B.Ed.) received ICT education at the school level, while diploma-level ICT training is more prominent in higher levels (80% in BBS). Advanced-level ICT training remains minimal, with low participation across all levels. ICT connection among teachers is limited, as "less teachers connect ICT is most notable in B.Ed. BBS. and M.Ed. (60%, 80%, and 77.77% respectively). Similarly, the use of ICT tools by teachers is minimal, with "no teachers use ICT tools" highest in 11/12 (50%). Concerningly, students from all levels report exposure to inappropriate content (violence/sex sites), particularly in BBS (60%). This data underscores the pressing need for comprehensive ICT training and responsible digital literacy programs for both teachers and students across all academic levels. Strengthening ICT integration in pedagogy, ensuring safe internet practices, and fostering ethical digital citizenship are essential steps toward enhancing educational quality and safeguarding learners from harmful online content. Additionally, institutional efforts must focus on upgrading infrastructure, encouraging teacher engagement with ICT tools, and embedding digital skills in curricula to bridge existing gaps and prepare students for an increasingly digital world.

ICT Awareness and Needs in Campus

Table 9: *ICT Awareness in Campus*

SN	Indicators/Level	11/12 100%	B.Ed. 100%	BBS 100%	M.Ed. 100%
1	Need ICT Course/Training in Campus	100	100	100	100
2	Need to Digitize the Campus	96.66	100	100	100
3	Aware to Cyber Crime	76.66	90	100	100
4	Aware to Cyber Law	73.33	50	100	88.88
5	Aware to Digital Account Hacking	70	20	60	77.77

Source: Survey, 2080/81

Figure 5 ICT Awareness and Needs in Campus
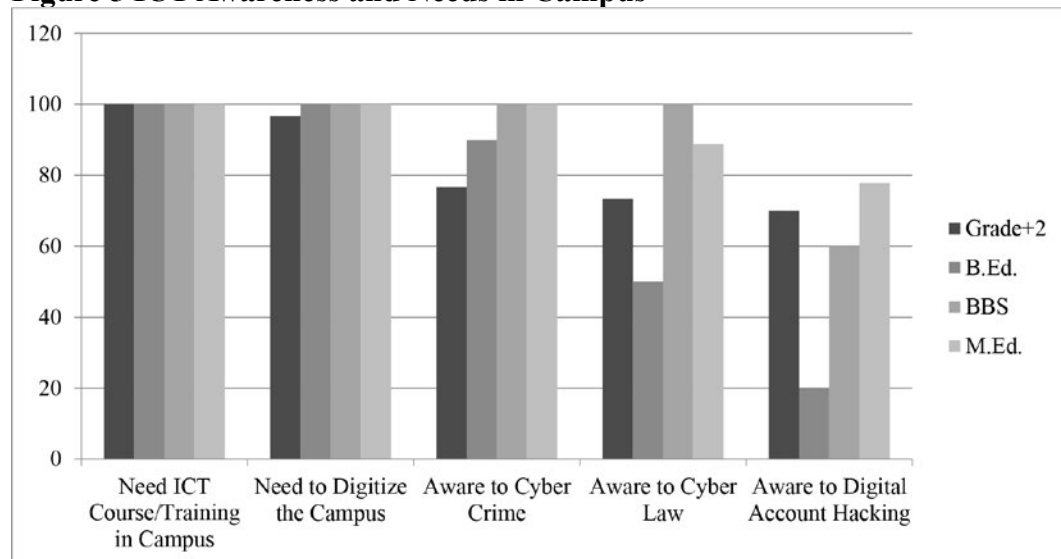
Source: Survey, 2080 81

The data highlights a unanimous need for ICT courses and campus digitization across all educational levels, reflecting strong awareness of ICT's importance. Awareness of cybercrime is high, especially in BBS and M.Ed. (100% each), but lower among 11/12 (76.66%) and B.Ed. students (90%), Cyber law awareness shows significant variation, with BBS achieving full awareness (100%) while only 50% of B.Ed. students are informed. Awareness of digital account hacking is highest in M.Ed. (b relatively low in B.Ed. (20%) and 11/12 (70%), indicating a knowledge gap among lower levels. These insights underline the necessity for targeted ICT and cyber-security education, especially for earty and intermediate students.

ICT Problems. Facing in Campus

The campus is experiencing several ICT-related challenges that hinder effective digital education and overall academic developmem. The key issues include. Lack of Essential ICT Infrastructure The campus lacks a smart notice board and interactive board, making information dissemination and interactive learning less effective. Additionally, not enough smart TVs are available for modem teaching methods. Inadequate Internet Access Limited internet access affects students' and facuhies" ability to engage in online learning, research, and digital activities. Absence of ICT Labs and Classrooms-The campus does not have a dedicated ICT lab and classrooms, restricting hands-on practical training and advanced digital leaming opportunities. No Implementation of ICT Courses-ICT courses have not yet been implemented. which prevents students from acquiring essential digital skills necessary for academic and professional growth. Shortage of ICT Tools and Materials The campus lacks sufficient ICT tools and materials, making it difficult to integrate technology into daily learning and administration. Outdated and Inefficient Software Systems There is no cloud-based system software, and the existing "Shiksha' software has not been upgraded, leading to inefficiencies in campus management and student records. Limited E-Library and Learning Management System (LMS) The absence of a fully functional e-library system and LMS prevents students and faculty from accessing digital learning resources and managing online coursework efficiently. Lack of ICT-Trained Faculty and Staff-The faculty and staff have not received adequate ICT training, reducing their ability to integrate technology into teaching. research, and administrative tasks. Lack of Enough E-Resources The campus does not have sufficient e-resources. restricting students' access to digital textbooks, research articles, and other academic materials necessary for effective study.

Addressing these ICT challenges is critical for enhancing digital learning, improving administrative efficiency, and keeping up with modern educational standards. Investing in infrastructure, software upgrades, faculty training, and course implementation will significantly improve the digital capabilities of the campus.

Strategies for Enhancing ICT Integration and Utilization at Barun Multiple Campus

To improve the integration and utilization of ICT in the educational and operational frameworks of Barun Multiple Campus, the following strategies measures should be implemented:

Strengthening ICT Infrastructure

Install smart notice boards, Interactive boards, and additional smart TVs in classrooms. Ensure high-speed internet access across the campus by expanding FTTH and Wi-Fi connectivity and establish a dedicated ICT lab and smart classrooms equipped with modern digital tools

Implementing ICT-Based Academic Programs

Introduce ICT-related courses in undergraduate and graduate programs. Offer certified digital skills training for students and faculty to enhance employability and research capabilities and develop and integrate a Learning Management System (LMS) for online coursework, assessments, and collaboration.

Enhancing Digital Resources and E-Library Access

Upgrade and expand the campus e-library with access to national and international journals, e-books, and research databases. Provide adequate digital teaching-learning materials for faculty and students and implement cloud-based academic management systems for data security and easy access to academic resources.

Faculty and Staff Capacity Building

Conduct regular ICT training workshops for faculty and administrative staff. Encourage faculty to use blended learning techniques incorporating digital tools in teaching and provide incentives for teachers who actively integrate technology in education.

Improving Campus Digital Administration

Upgrade the existing 'Shiksha' software for better academic and administrative management. Implement a cloud-based digital record-keeping system for improved efficiency and automate routine administrative tasks such as attendance, result processing, and fee management using ICT tools.

Promoting ICT Awareness and Cyber Security

Conduct seminars and awareness programs on cyber laws, digital security, and data protection for students and staff and implement cyber-security policies to safeguard academic and administrative data.

By implementing these strategies. Barun Multiple Campus can transform into a

digitally empowered institution that enhances learning, teaching, research, and administration while ensuring its sustainability in the digital era.

Recommendations for Utilizing Smart Digitization Technologies at Barun Multiple Campus

To enhance campus management, administration, teaching, learning, research, and student services. Barun Multiple Campus should adopt smart digitization technologies that improve efficiency, accessibility, and overall academic experience. Below are key recommendations:

Smart Campus Management & Administration

The introduction of a Campus Management System (CMS) is proposed to digitize and streamline key administrative and academic functions. This integrated platform will manage processes such as admissions, student attendance, financial operations, and human resources, resulting in improved efficiency, transparency, and service delivery across the campus. To further enhance the institution's digital capacity, the existing Shiksha software will be upgraded into a cloud-based system. This upgrade will offer greater data security, real-time backup, and remote accessibility, enabling users to manage information seamlessly from any location with internet access. The adoption of an E-Governance Framework will promote a paperless environment by incorporating online approvals, digital signatures, and workflow automation. This transition will simplify administrative procedures for faculty and staff, reduce paperwork, and improve the speed and accountability of internal operations. Automated notifications and alerts will be deployed through email, SMS, and mobile applications to ensure timely communication with students and staff. This smart system will deliver instant updates on academic schedules, administrative announcements, and emergency alerts, fostering better engagement and coordination.

Finally, the implementation of smart energy and security systems will include CCTV surveillance, biometric entry systems, and energy-efficient technologies. These upgrades aim to bolster campus safety while ensuring optimal energy consumption, contributing to a secure and sustainable educational environment.

Digital Teaching & Learning Enhancement

To enhance digital teaching and learning, the implementation of a Learning Management System (LMS) such as Moodle, Google Classroom, or Blackboard is recommended. An LMS will support interactive teaching by enabling the management

of assignments, quizzes, discussions, and virtual collaboration between students and faculty in a centralized digital space. A hybrid learning setup will be introduced by equipping classrooms with modern tools like interactive whiteboards, smart TVs, and video conferencing systems. This setup will enable blended learning, combining traditional face-to-face instruction with online learning experiences to accommodate diverse student needs and schedules. To support flexible and accessible education, digital content development will be prioritized. Faculty members will be encouraged to produce and share e-learning materials, including recorded lectures and online course modules. This initiative will ensure that students can revisit lessons and learn at their own pace, regardless of location. The introduction of virtual labs and simulations will further enrich academic experiences, particularly for science, business, and IT programs. These virtual environments will allow students to perform experiments and practice skills online, bridging gaps caused by limited physical lab access.

Finally, AI-powered student analytics will be utilized to monitor academic performance, attendance, and student engagement through intelligent dashboards. These tools will help faculty identify at-risk students early and provide tailored interventions, ultimately improving learning outcomes and retention rates.

Research & Academic Digitization

To strengthen academic and research capabilities, the development of a cloud-based e-library is essential. This digital platform will provide faculty and students with expanded access to e-resources, digital archives, and remote access to scholarly materials. By enabling 24/7 availability of journals, books, and reference content, the e-library will significantly support academic inquiry and research activities across disciplines. The integration of AI-assisted research tools such as Grammarly for writing enhancement, Turnitin for plagiarism detection, and AI-powered data analytics tools will play a key role in improving the quality and originality of research outputs. These tools not only ensure academic integrity but also assist in data analysis and effective communication of research findings. To foster knowledge exchange and academic networking, research collaboration platforms like Google Scholar, ResearchGate, and Microsoft Teams will be promoted. These platforms will help researchers collaborate, share publications, engage in scholarly discussions, and stay updated with the latest developments in their fields.

Furthermore, the adoption of Open Educational Resources (OERs) will be encouraged. These free and open-source educational materials will help reduce the financial burden on students and broaden access to high-quality learning content. OERs also

promote a culture of knowledge sharing and inclusive education, making learning more equitable and accessible.

Smart Student Services & Engagement

Digital Student Portal: Develop an Al-enabled student portal for academic records. timetables, fee payments, and service requests. Al Chatbots & Virtual Assistants: Use chatbots for real-time student support and inquiries about courses, admissions, and campus facilities. Online Career & Placement Services: Implement virtual job fairs, Al-driven career guidance, and online internship portals for students. Wellness & Counselling Services: Offer digital mental health and counselling services via Al-driven platforms and telemedicine.

Cyber-security & Digital Ethics

Implement Cyber-security Measures: Deploy firewalls, encrypted communications, and regular cyber-security training for students and faculty. Digital Ethics & Responsible Use Policy: Educate users about data privacy. plagiarism prevention, and cyber-security risks in digital education.

By strategically adopting these smart digitization technologies. Barun Multiple Campus can significantly enhance education, research, administration, and student experience. The transition to a digital campus will foster innovation, improve efficiency, and position the institution as a modern, future-ready educational centre.

FINDINGS

ICT Infrastructure and Facilities:

Barun Multiple Campus (BMC) has a foundational ICT setup, including computers, multimedia projectors, and smart classroom equipment. However, there is an urgent need for additional branded computers, smart TVs. interactive boards, and ICT-equipped classrooms to enhance teaching and learning activities.

Internet Connectivity and Digital Access:

Limited NT Fiber internet connectivity affects seamless access to digital learning resources and online academic platforms. Plans are in place to extend internet access to more locations within the campus to improve efficiency in academic and administrative functions.

ICT in Teaching and Learning:

Some faculty members use multimedia projectors and digital materials in their instruction, but digital teaching methods are not yet fully integrated across all courses. Structured ICT training programs are required to enhance faculty and student digital literacy for effective teaching and learning.

Implementation of ICT Course and Curriculum:

BMC has initiated the process of introducing ICT as a core academic course at different levels, aligning with Tribhuvan University's approval and guidelines. Plans are underway to introduce ICT courses in the B.Ed. program, making ICT education a part of mainstream academic studies. The integration of computer science in the management faculty for Grade 11 and 12 students has been prioritized, allowing students to gain foundational ICT skills. Various levels of Tribhuvan University-certified ICT training courses focusing on employability skills are planned to enhance students' career prospects.

Administrative Digitalization:

The campus has started integrating ICT for student data management. Internal communication, and online information dissemination. Full digital transformation of campus administration is needed, requiring further resources, training, and infrastructure upgrades

Challenges in ICT Integration:

Limited budget and funding constraints have slowed ICT expansion, delaying full implementation of digital learning and ICT infrastructure upgrades. Faculty members require intensive training on modern ICT tools for effective digital classroom management. The lack of a dedicated ICT technical team has made troubleshooting and maintenance a challenge.

Open Access Level-wise ICT Training Courses.

BMC is planning to introduce open-access ICT training programs at multiple levels to support students, faculty, and community members.

These courses will be categorized into;

Basic ICT Skills Training (for beginners and non-technical users). Advanced ICT Training (for faculty members and technical students). Digital Skills & Al Training

(for enhancing research and professional capabilities). The objective is to improve digital literacy and create a technologically competent academic environment for students, faculty, and administrative staff.

Future ICT Development Plans:

BMC aims to upgrade its ICT resources, expand internet facilities, and implement digital training programs across all levels. The campus is actively seeking funding and collaboration opportunities to accelerate ICT development and infrastructure expansion. Integration of ICT into research, online learning, and academic projects is a priority to modernize the institution.

CONCLUSION

The conclusion highlights that Barun Multiple Campus (BMC), Khandbari has made notable progress in integrating Information and Communication Technology (ICT), positively impacting both academic and administrative functions. While foundational ICT infrastructure is in place, further development—such as increased access to computers, internet, and smart learning tools—is necessary to fully support teaching, learning, and research.

The campus's inclusion of ICT as part of the curriculum, especially in B.Ed. and +2 programs, is a strategic step toward building students' digital competencies. However, to create a truly digitally literate campus, structured ICT training for both students and faculty must be prioritized. Challenges remain, particularly in terms of limited funding, insufficient technical support, and a lack of faculty training, which hinder full ICT integration.

To address these issues, BMC must secure additional financial resources, conduct regular digital literacy workshops, and build strategic partnerships to support ICT development. If these measures are implemented effectively, BMC has the potential to become a leading example of ICT-based education in rural Nepal, significantly improving the educational experience and operational efficiency.

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