

Assessment of ICT Facilities Utilisation Among Category 'A' Staff (Teaching and Non-Teaching) in Colleges of Education Affiliated with the University of Cape Coast

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Abstract

This study assessed the utilization of ICT among teaching and non-teaching staff in colleges of education, highlighting its importance in modern educational environments. Despite widespread use of laptops, desktops, and software like MS Word and PowerPoint, challenges such as inadequate ICT infrastructure, unreliable internet connectivity, and frequent power interruptions hinder optimal use. Most of the staff had received adequate ICT training, further professional development is necessary to keep pace with technological advancements. Recommendations include increasing the number of computers and projectors, modernizing facilities, and investing in robust internet and power infrastructure. Regular training sessions should be organized to enhance digital skills, and maintenance schedules should be established for ICT equipment. Strengthening collaboration between college management, mentoring universities, and ICT units, and developing comprehensive ICT policies are essential. Equipping college libraries with necessary ICT tools and internet connectivity is also recommended to support academic and administrative work.

Keywords: Softwares; Internet; Colleges; Research; Teaching staff; Non-teaching staff; ICT Infrastructure;

Introduction

Information and Communication Technology (ICT) has become a critical component in improving administrative and instructional procedures in higher education institutions (HEIs). ICT integration and its application makes a wide range of jobs easier, such as streamlining administrative processes, enabling interactive learning environments, and boosting stakeholder communication (Mishra & Koehler, 2006). Thus, a key component of HEIs' overall efficacy and efficiency is the use of ICT by both teaching and non-teaching staff. There are several benefits of teaching and non-teaching staff acceptance and efficient use of ICT resources. According to Pelgrum (2001), ICT technologies give teachers the ability to use more dynamic and interactive teaching techniques, which enhance student engagement. ICT also helps with the effective administration of course materials, online tests, and remote learning, all of which are becoming more and more crucial in the aftermath of international crises like the COVID-19 pandemic (Dhawan, 2020). Despite these benefits, there are significant differences in the extent to which educators use ICT, depending on a variety of criteria including personal competency, institutional support, and resource accessibility (Ertmer & Ottenbreit-Leftwich, 2010).

In a similar vein, non-teaching employees in HEIs gain from ICT integration in their administrative duties. From student admissions and records management to financial administration and communication, the use of ICT systems in administrative procedures improves the precision,

speed, and transparency of operations (Beynon-Davies, 2009). By ensuring that non-teaching staff can carry out their responsibilities more effectively, effective ICT deployment in these areas contributes to the overall operational excellence of HEIs. Several factors including organizational culture, training, and access to tools are important in determining the extent to which non-teaching personnel use these technologies (Hu, Clark, & Ma, 2003).

Despite the enormous benefits of the use of ICT in HEIs, there are also several obstacles that prevent it from being used to its full potential. The efficient use of ICT by teaching and non-teaching staff can be hampered by problems like poor infrastructure, lack of technical support, and inadequate training programmes (Zhao & Frank, 2003). These issues may even be escalated due to resistance to change and the digital divide that exists within an organisation across various demographic groups. Therefore, in order to fully utilise the ICT facilities at HEIs for improving administrative and instructional tasks, these obstacles must be removed.

This study aims to assess how the Category A Staff (teaching and non-teaching) in the Colleges of Education affiliated to the University of Cape Coast are currently utilizing ICT facilities and offer insights that can guide policy decisions and strategic actions focused on enhancing ICT adoption and integration in these Colleges.

Research Objective

The primary objective of this study is to assess how the Category A Staff (teaching and non-teaching) in the Colleges of Education affiliated to the University of Cape Coast are currently utilizing ICT facilities, highlighting their effective usage and the difficulties faced. Furthermore, this study seeks to explore effective strategies and best practices for promoting ICT utilization in Colleges of Education.

Research Questions

1. What are the issues relating to availability, adequacy and utilization of ICT facilities among teaching and non-teaching staff in Colleges of Education?
2. In what ways can the use of ICT facilities be enhanced in Colleges of Education?

Significance of the Study

The significance of this study lies in its potential to enhance educational and administrative efficacy. By identifying the extent to which ICT tools are used and uncovering the barriers to their effective adoption, the outcome of this study can inform policy decisions and strategic initiatives aimed at improving ICT integration. Understanding the diverse factors that influence ICT utilization such as training needs, resource availability, and institutional support enables Colleges of Education to address gaps and disparities, thereby fostering a more inclusive and efficient environment. Ultimately, this study contributes to the advancement of teaching methodologies, administrative operations, and overall institutional performance, positioning the Colleges of Education to better meet the demands of contemporary teaching and learning activities.

LITERATURE REVIEW

Theoretical Review

The Technology Acceptance Model (TAM), developed by Davis (1989), serves as a robust theoretical framework to understand the factors influencing the acceptance and utilization of ICT among teaching and non-teaching staff in Higher Education Institutions (HEIs). TAM posits that two primary factors, perceived usefulness and perceived ease of use, significantly determine users' acceptance and subsequent utilization of technology. This model provides a valuable lens through

which to examine the current state of ICT facilities utilization in Colleges of Education affiliated to the University of Cape Coast.

Perceived usefulness, defined as the degree to which an individual believes that using a particular system would enhance their job performance, is a critical determinant of ICT adoption among teaching staff. In this context, the effective use of ICT can significantly enhance teaching methodologies, facilitate innovative educational practices, and improve student engagement and learning outcomes (Venkatesh & Davis, 2000). The actual utilization of ICT tools varies widely among educators due to differences in their perceptions of usefulness. Hence, this study aims to explore these perceptions in detail, identifying factors that either promote or hinder the perceived usefulness of ICT among teaching staff, thereby providing insights that can help bridge the gap between potential and actual ICT use in educational settings. The perceived ease of use, the degree to which an individual believes that using a particular system would be free of effort, is another crucial factor influencing ICT adoption. For the non-teaching staff, the efficiency and effectiveness of administrative operations can be significantly enhanced through the use of ICT. However, without adequate training and support, these staff members may find ICT systems complex and challenging to use, leading to underutilization (Hu, Clark, & Ma, 2003). This study seeks to assess the current level of ease of use perceived by non-teaching staff and to identify specific areas where training and support are needed. Understanding these aspects is essential for developing targeted interventions that can improve the overall utilization of ICT facilities in Colleges of Education.

TAM also emphasizes the importance of attitudinal and behavioral intentions in determining actual technology use. Further, according to Venkatesh and Bala (2008), external variables such as organizational resources, technical support, and the availability of user-friendly ICT tools significantly influence both perceived usefulness and ease of use. This study will therefore examine the current state of organizational support and infrastructure in HEIs, identifying gaps and areas for improvement.

Conceptual Review

Application of ICT in Research, Teaching and Learning, and Academic Information Services

The application of ICT in research has revolutionized the way scholarly work is conducted, analyzed, and disseminated. ICT tools such as data analysis software, digital libraries, and online databases have significantly enhanced the efficiency and accuracy of research activities. Researchers now have access to vast amounts of information and resources that can be easily retrieved, organized, and analyzed. For instance, digital repositories and online journals provide researchers with immediate access to current studies and publications, facilitating a more comprehensive literature review process (Borgman, 2007).

Moreover, ICT facilitates collaborative research by enabling seamless communication and data sharing among researchers globally. The digital platforms allow researchers to share their work, seek feedback, and collaborate on projects regardless of geographical barriers (Luo, 2010). Additionally, the use of cloud computing and storage solutions has made it easier for researchers to store and access large datasets securely. This technological advancement does not only enhance the scope of research but also accelerates the pace at which research is conducted and shared with the wider academic community.

In the realm of teaching and learning, ICT has transformed traditional educational practices into more dynamic, interactive, and student-centered approaches. The integration of digital tools such as interactive whiteboards, online learning management systems and educational software has created more engaging and effective learning environments (Means et al., 2009). These technologies support a variety of instructional methods, where students engage with instructional

content at their own pace and time, often outside the traditional classroom setting. ICT enables personalized learning by providing educators with tools to tailor instruction to meet individual student's needs. Furthermore, ICT tools facilitate collaborative learning through online forums, social media, and virtual classrooms, where students can work together on projects, share resources, and engage in discussions, thus enhancing their critical thinking and problem-solving skills.

Academic information services have also been significantly enhanced by the application of ICT. University libraries, for instance, have evolved into digital libraries, offering electronic resources such as e-books, e-journals, and online databases that are accessible remotely. This transformation has expanded the accessibility of academic resources, allowing students and faculty to access information at any time and from any location (Jantz, 2012). Additionally, ICT tools have improved the management and dissemination of academic information through Integrated Library Systems (ILS) and digital repositories, which streamline the acquisition, cataloging, and retrieval of library resources.

Additionally, ICT supports information literacy programmes by providing online tutorials, webinars, and interactive guides that help users develop essential research skills. These programmes are crucial in equipping students and faculty with the knowledge and skills needed to navigate and critically evaluate the vast array of information available in the digital age (Andretta, 2005). Furthermore, ICT facilitates the preservation and sharing of academic output through institutional repositories, which archive research papers, theses, dissertations, and other scholarly works, making them accessible to a broader audience and ensuring their long-term preservation.

Empirical Review

Pelgrum (2001) studied significant barriers to ICT integration in education across various countries. Some of the barriers included inadequate hardware and software, insufficient teacher training, and organizational restrictions. The findings emphasized the need for strategic investment in ICT infrastructure and comprehensive training programmes to overcome these obstacles and enhance the effective use of ICT in educational settings. Similarly, Ertmer and Ottenbreit-Leftwich (2010) explored the factors influencing teachers' use of technology, highlighting the critical role of beliefs, confidence, and professional development. The study found that teachers' perceptions of technology's value, coupled with strong administrative support and a positive institutional culture, significantly impacted their integration of ICT into teaching practices.

Hu, Clark, & Ma (2003) conducted a longitudinal study which utilized the Technology Acceptance Model (TAM) to examine the factors affecting technology acceptance among school teachers. The findings indicated that perceived usefulness and ease of use were key predictors of ICT adoption. Additionally, the study stressed the importance of providing adequate technical support and creating a supportive environment to enhance teachers' attitudes towards technology.

Zhao & Frank (2003) also investigated the ecological factors influencing technology use in schools, revealing that the availability of resources, teachers' technology proficiency, and supportive school culture were crucial determinants of ICT integration. The study emphasized the necessity for targeted interventions to address disparities in access and training, thereby fostering a more conducive environment for effective technology use.

RESEARCH METHODS

The study used the explanatory research design and a quantitative methodology. One hundred and twenty-two (122) teaching staff and thirty-five (35) non-teaching staff participated in this study. Two separate online questionnaires were utilised to gather data for this study. As prescribed by Kim (2016), the structured questionnaire is the best method of gathering data for

explanatory research. Descriptive statistics including frequency, percentages, mean, and standard deviation were utilised to analyse the processed data, which was processed using SPSS version 26. Tables with the results have been displayed. Ethics were adequately respected, with guarantees of anonymity, confidentiality of responses, and voluntary participation.

RESULTS AND DISCUSSION

PART A- ANALYSIS OF TEACHING STAFF QUESTIONNAIRE

Demographic information of respondents

A total of 122 responses were obtained via the online questionnaire and all departments in the Colleges were represented. Respondents cut across all the 16 Colleges of Education affiliated to University of Cape Coast. Out of the respondents, 73% were males while 27% were females. Many of the respondents (45.1%) aged between 46-55years while 33.6% were between 36-45years. The remaining respondents were either above or below these ages brackets. With regards to teaching rank, 67.2% were Tutors; followed by 29.5% who were Senior Tutors and 3.3% being Principal Tutors. The longest serving respondent had been in the College for 26 years, with the remaining ranging between one and twenty years.

Main Results

Availability, Adequacy and Utilization of ICT Facilities among Teaching Staff

This section of the questionnaire sought to solicit information on the availability of ICT facilities, their adequacy and the appropriateness of their location to users. Table 1 presents a summary of the responses:

Table 1: Availability, Adequacy and Utilization of ICT Facilities among Teaching Staff

Statement	Frequency	Percentage
How accessible is a computer to you? Select your response		
I have no access to a computer	6	4.9
I have a computer that stands alone	70	57.4
I have a networked computer	46	37.7
If you have a computer, what type of computer is it?		
Desktop	21	13.0
Laptop	110	71.0
Tablet	25	16.0
Which of the following ICT tools/application software do you use most in doing your work? (select as many as appropriate)		
MS Word	114	93.4
MS Excel	68	55.7
Desktop Publishing	9	7.4
Database Systems	15	12.3
MS PowerPoint	103	84.4
Electronic Mails	60	49.2

WhatsApp	105	86.1
Facebook	45	36.9
Instagram	16	13.1

How would you rate the reliability and stability of your internet/intranet connection in terms of the number of hours/days it is on?

Very Poor	17	13.9
Poor	43	35.2
Good	49	40.2
Very Good	10	8.2
Excellent	3	2.5

How would you rate the speed of your Internet/intranet connection?

Very Poor	18	14.8
Poor	43	35.2
Good	53	43.4
Very Good	6	4.9
Excellent	2	1.6

Source: field data (2024)

With regards to the location of ICT resources available to respondents, Table 2 displays the specific resources and their respective frequencies:

Table 2: Location of ICT resources available to teaching staff

RESOURCES	LOCATION OF RESOURCES			
	In my office	In another office	Departmental Computer Laboratory	ICT Centre
Computer	70	15	20	17
Printers	34	61	16	11
Application Softwares	49	33	17	23
Online Resources	64	21	22	15

Source: field data (2024)

With the issues pertaining to proficiency in ICT, 92.6% of respondents affirmed they have received training in the use of ICT facilities, with the remaining 7.4% agreeing to no such training. When asked where participants received their training, 41% selected College sponsored training programmes; 37.7% had trainings on their own, 18.9% had attended computer/ICT training school whereas 2.5% had not received any form of training at all. Subsequently, participants were asked if they perceived their previous training as adequate. In response, 73% said their training was adequate, 18% chose 'inadequate training' and 9% selected 'very adequate'. Respondents rated their general proficiency in ICT as follows: 6.6% (beginner), 75.4% (ordinary) and 18% (experts).

Application of ICT in Teaching, Learning and Research

Table 3 below presents a summary of how respondents apply ICT in teaching and learning as well as research in their various Colleges. Each statement is matched with its respective frequency

Table 3: Application of ICT in Teaching, Learning and Research

	Very Often	Often	Quite Often	Not At All
How often do you use ICT in developing your teaching materials?	55	37	26	4
How often do you use ICT to present lectures?	49	33	32	8
How often do you use ICT in giving and receiving of assignments?	23	38	48	13
How often do you use ICT for distance or online teaching	27	44	41	10
How often do you use ICT to provide basic computer literacy skills to your students?	22	39	50	11
How often do you use ICT to provide computer skills relevant to respective academic disciplines to your students?	23	45	46	8
How often do you use ICT to do other online activities?	52	44	20	6
How often do you use ICT in Research? Example data collection	53	47	15	7
How often do you use data processing tools like statistical packages, N6, simulations etc.?	27	39	41	15
How often do you use ICT to collect academic information?	44	50	24	4
How often do you use ICT to disseminate academic information?	44	54	19	5
How often do you use ICT to collaborate research Worldwide?	41	47	28	6

Source: field data (2024)

It is observed from Table 3 above that, ICT is highly applied in teaching, learning and research. For instance, 118 out of the total 122 respondents agreed that they use ICT in developing their teaching materials. Similarly, 114 respondents use ICT to present lectures. It is also observed that, 115 respondents use ICT in Research such as data collection as compared to 7 respondents who do not use ICT for research at all.

The questionnaire also inquired of participants how they apply ICT in academic information services. When asked how often they use ICT facilities in the library to access academic information/journals, 75.4% agreed they usually do while 24.6% said they never use ICT facilities in the library for academic information. Respondents were further asked if they use ICT facilities in the library to access other virtual libraries. 72.9% admitted frequent usage while the remaining 27.1% said they never use those facilities in the library. Finally, respondents were asked how often they ask the library staff to assist in collecting information from the internet. Results showed that, 68% of the respondents often (ask library staff for assistance in internet usage while 32% rarely asked for such assistance.

In relation to respondents' awareness of ICT Organizational Support, 37.7% said they are aware the College has units that carry out management and maintenance of the ICT infrastructure/facilities. 17.2% affirmed their knowledge that the College has an office/committee that consider users' ICT needs. 14.8% asserted the College has a committee that defines and monitor institutional policies, practices and standards on ICT usage. Interestingly, a relatively large percentage of the respondents (30.3%) did not know about any of the aforementioned.

Considering the constraints in the application and use of ICT, the following findings have been summarized in Table 4 below:

Table 4: Constraints in the application and use of ICT

Constraint	Frequency	Percentage
Inadequate ICT infrastructure	78	63.9
Constant interruption of electricity supply	63	51.6
Unavailability of spares of gadgets/equipment	33	27
Unreliable Internet Service Providers	76	62.3
Inadequate knowledge in the field of computing	12	9.8
Inadequate replacement and routine maintenance regimes of ICT facilities	40	32.8

Source: field data (2024)

Respondents were further asked to rank in terms of priorities, what they would consider as the major ICT needs of their Colleges. The results indicated that most respondents prioritized ICT facilities for teaching, learning and research (79.5%); followed by ICT facilities for library and archival services (8.2%), and then ICT facilities for administration/management and financial purposes (6.6%). The least prioritized was ICT facilities for students' services (5.7%). On the whole, 50% of respondents rated their ICT facilities as Satisfactory, 1.6% as Very Satisfactory and 48.4% as Not Satisfactory.

How to Improve ICT in Teaching, Learning, Research and Students Services in Colleges.

The last section of this questionnaire sought to solicit the opinions of teaching staff on ways of improving ICT in teaching, learning, and research and students services in the various Colleges. According to respondents, the ways of improving ICT included:

Availability of Infrastructure and ICT Equipment

Having sufficient ICT infrastructure and equipment, including computers, projectors, and state-of-the-art ICT laboratory are crucial for creating a favourable environment for digital learning and research. Well-equipped ICT laboratories and classrooms allow students and teachers to utilize technology for improved educational results, such as interactive learning experiences and streamlined research processes. The following suggestions were made by the respondents:

- Provision of ICT Equipment:
 - Provision of adequate computers for departments and student's usage
 - More computers should be bought for the college
 - ICT equipment should be increased in the college.
 - There should be provision of enough resources such as projectors and laptops
 - Acquisition of modern ICT gadgets and Apps for teaching, learning and research
 - Make computers available and improve infrastructure
 - Ultra modern ICT laboratory should be built
 - ICT laboratory should be constructed and stocked with computers and network
 - The institution should provide appropriate ICT tools to tutors
 - Projectors should be made available in lecture rooms
 - The college should look for sponsorship to buy more projectors

Internet connectivity

Dependable and fast internet access is crucial for the efficient utilization of ICT in education, learning, research, and student services. A reliable internet connection enables uninterrupted access to online materials, instructional platforms, and communication tools, hence increasing the entire academic experience. Enhanced internet infrastructure would bolster the incorporation of digital learning resources, encourage streamlined online research, and promote instantaneous cooperation among students and staff.

In terms of internet access, the respondents indicated the following as ways to improve, develop and use ICT in teaching, learning, research and students' services in the Colleges of Education:

- Provision of accessible and stable internet in the Colleges
- There should be collaboration between ICT unit and management
- Improvement in internet connectivity
- Provide internet service for members of the College community
- Provision of adequate internet facilities
- Provision of College-based internet facility

Consistent and reliable power supply is fundamental to the effective operation of ICT facilities. Power interruptions can disrupt teaching, learning, and research activities, leading to decreased productivity and morale. Ensuring a stable power supply will help maintain continuous access to ICT resources and support the college's academic objectives. In terms of electricity supply/power supply under internet connectivity, the following suggestions were made by the respondents:

- The supply of electricity should be improved.
- Provision of reliable electricity and high-speed internet connectivity.
- Rampant interruption of electricity supply should be checked.

Maintenance, Training and Support

Regular maintenance and technical assistance are crucial for guaranteeing the continued functionality and effectiveness of ICT systems. Providing training to both staff and students in the colleges of education on the utilization of ICT tools improves their capacity to successfully employ these resources, hence fostering a more technology-driven educational setting. Ways of effective training and support for ICT usage were suggested by the respondents:

- Training workshop for all tutors in the use of ICT
- Continuous training in ICT applications
- Series of in-service training for staff and students
- Training for staff in the use of ICT in teaching
- Regular workshops for staff and students on the use of various ICT tools

Collaboration and Management

Successful collaboration between the ICT unit and college management is essential for the strategic development and execution of ICT initiatives. Efficient managerial strategies and well-informed decision-making can greatly boost the incorporation of information and communication technology (ICT) into the academic structure, resulting in enhanced educational, learning, and research results. The following were suggested by the tutors in the colleges of education:

- There should be collaboration between ICT UNIT and Management.
- Management of the college has to invest in ICT infrastructure.
- There should be a committee in charge of the provision and maintenance of ICT tools.
- Collaborative support between the administration and teachers in the use of ICT.

Individual Specific Requests

Some of the respondents made specific requests to improve and develop the use of ICT among students and tutors in the various colleges of education. Below are some of their suggestions:

- Tutors and students should be given laptops to facilitate teaching and learning.
- Senior common room must be provided with intranet/internet accessibility.
- The use of ICT goes with other gadgets like projector and reliable source of power, the college should have enough projectors and alternative powers sources and also acquire stable internet/ intranet.

Other Suggestions

- ICT Centres need to be completed.
- Conscious efforts be made to strengthen ICT/internet infrastructure.
- Continuous professional development sessions on ICT usage for the staff and technicians.
- Management should provide the necessary ICT tools for staff.

RESULTS AND DISCUSSION

PART B- ANALYSIS OF NON-TEACHING STAFF QUESTIONNAIRE

This section's goal was to provide an overview of how frequently the non-teaching staff used and applied ICT for management, administration, and research.

Demographics of Respondents

A total of Thirty-five (35) Non-Teaching Staff, across the various Colleges participated in this study. Twenty (25) respondents, representing 71.4% of this sample were males while the remaining 10 (28.6%) were females. With regards to their age ranges; 71.4% were between the ages of 36-45years; 20% were between 46-55years; 5.7% were between 25-35years. Only one respondent (representing 2.9%) was aged above 56years. The distribution of participants' departments was as follows: Administration/Management (60%); Finance (28.6%); and Internal Audit (11.4%). Number of years respondents have worked with their Colleges ranged from 1 year to 17 years. Included in the participants were College Secretary, Deputy College Secretary, Senior Deputy College Secretary, Assistant College Secretary, College Finance Officer, Deputy Finance Officer, Accountant, Senior Assistant Accountant, Assistant Accountant, Internal Auditor, Deputy Internal Auditor, Assistant Deputy Internal Auditor, Senior Assistant Internal Auditor, College Librarian, Deputy Librarian, Assistant Deputy Librarian, Senior Assistant Librarian and Assistant Librarian.

Main Results

Availability, Adequacy and Location of ICT Facilities

Participants were asked to indicate availability, adequacy and location of the ICT facilities in their respective Colleges. The results obtained from respondents are presented in Table 6 below:

Table 6: Availability, Adequacy and Location of ICT Facilities

Statement	Frequency	Percentage
How accessible is a computer to you		
I have no access to a computer	2	6
I have a computer that stands alone	20	57
I have a networked computer	13	37
If you have a computer, what type of computer is it?		
Desktop computer	24	68.6
Laptop computer	18	51.4
Tablet	2	5.7
Which of the following ICT tools/application software do you use most in doing your work?		
MS Word	33	94.3
MS Excel	31	88.6
Desktop Publishing	1	2.9
Database Systems	5	14.3
MS PowerPoint	18	51.4
Electronic Mails	14	40
WhatsApp	21	60
Facebook	8	22.9
Instagram	4	11.4

Source: field data (2024)

Subsequently, participants were asked questions about the location of ICT resources available to them. It can be observed that most participants have ICT resources such as computers and printers readily available in their own offices. However, some application softwares and online resources could be found in other places such as their Heads' offices, other offices and departmental computer library or at the ICT Centre. Table 7 displays the specific resources and their respective frequencies:

Table 7: Location of ICT resources available to non-teaching staff

RESOURCES	LOCATION OF THE RESOURCES				
	In my office	Head's office	In another office	Departmental Computer Laboratory	ICT Centre
Computer	33	1	1	-	-
Printers	28	1	6	-	-
Application Softwares	19	3	9	1	3
Online Resources	18	1	10	2	4

Source: field data (2024)

Pertaining to the reliability and stability of internet/intranet connection in the Colleges, a majority of respondents (54.3%) said they had good internet connection, 14.3% had 'Very good', 5.7% indicated 'Excellent connection' whereas 14.3% and 11.4% indicated 'Poor' and 'Very poor' respectively.

To assess the proficiency of respondents in ICT, participants were asked if they had received any training in the use of ICT facilities. 77.1% affirmed they had received training while 22.9% stated 'No'. For those who had received training, 48.6% learnt on their own; 28.6% attended College sponsored training programmes and 20% attended computer/ICT training schools. From the results, 62.9% of respondents stated that the training they had received was adequate; 20% were certain that their training was very adequate and 17.1% indicated that their training on ICT was inadequate. Participants rated their general proficiency in ICT as follows: Beginner (2.9%), Ordinary (80%) and Expert (17.1%).

Application of ICT in office work and research

It was necessary to know how non-teaching staff apply ICT in their daily work schedules and for research purposes. In Table 8, these results have been presented alongside their frequencies:

Table 8: Application of ICT in office work and research

	Very Often	Often	Quite Often	Not At All
How often do you use ICT in your work at the office?	18	8	5	4
How often do you use ICT to communicate with other staff	14	9	5	7
How often do you use ICT to assign tasks to the staff in the office?	13	7	10	5

How often do you use ICT to receive feedback from your subordinates?	8	12	8	7
How often do you use ICT to disseminate/share information to colleague in other units and sections?	12	10	8	5
How often do you use ICT for distance/online learning to enhance your capacity /competencies on the job?	8	12	10	5
How often do you use ICT to collect/share Information with colleagues in the other Colleges and stakeholders	12	7	10	6
How often do you use ICT in research into new concepts, issues and theories in management/administration?	12	11	10	2
How often do you use ICT to solicit for information on best practices, new ideas, new policies/regulations in higher education environment	13	12	8	2
How often do you use ICT to disseminate/share information to colleague in other units and sections?	10	12	9	4
How often do you use ICT to collaborate and new share ideas with your peers in other tertiary institutions?	9	13	11	2

Source: field data (2024)

It is observed from Table 8 that respondents often apply ICT in office work and research across the Colleges. Practically, 31 respondents use ICT in their work at the office; 28 respondents out of the total 35 sample use ICT to receive feedback from their subordinates; 30 participants use ICT for *distance/online learning to enhance their capacity /competencies on the job*; 33 use ICT to *solicit for information on best practices, new ideas, new policies/regulations in higher education environment and 33 as well use ICT to collaborate and new share ideas with their peers in other tertiary institutions*.

The questionnaire also sought to solicit information on respondents' awareness of ICT Organizational Support. In relation to this, 28.6% said they are aware the College has units that carry out management and maintenance of the ICT infrastructure/facilities. 25.7% affirmed their knowledge that the College has an office/committee that consider users' ICT needs. 8.6% asserted that the College has a committee that defines and monitor institutional policies, practices and standards on ICT usage. Surprisingly, a relatively large percentage of the respondents (37.1%) did not know about any of the aforementioned.

When asked about challenges respondents faced in the application and use of ICT, the following results, tabulated below were gathered:

Table 9: Constraints in the application and use of ICT

Constraint	Frequency	Percentage
Inadequate ICT infrastructure	10	28.6
Constant interruption of electricity supply	9	25.7
Unavailability of spares of gadgets/equipment	3	8.6
Unreliable Internet Service Providers	8	22.9
Inadequate knowledge in the field of computing	2	5.7
Inadequate replacement and routine maintenance regimes of ICT facilities	3	8.6

Source: field data (2024)

Respondents were finally asked to rank in terms of priority, what they would consider as the major ICT needs of their Colleges. The results indicated that most respondents prioritized ICT facilities for administration/management and financial purposes (48.6%), followed by ICT facilities for teaching, learning and research (22.9%); next was ICT facilities for library and archival services (17.1%). The least prioritized was ICT facilities for students' services (8.6%). On the whole, 68.6% of respondents rated their ICT facilities as Satisfactory, 2.9% as Very Satisfactory and 28.6% as Not Satisfactory.

Improvements in ICT Utilization in Colleges of Education

To enhance ICT use in administration, teaching, learning, research, and student services, stakeholders must invest significantly in ICT infrastructure. Recent studies by Remache and Belarbi (2019) indicate that such investments lead to high growth rates in various economic sectors. Colleges should allocate more financial resources towards developing ICT infrastructure, ensuring a steady supply of ICT equipment/gadgets, and securing adequate internet bandwidth. Respondents highlighted the need for frequent training sessions and workshops to keep staff updated on the latest digital technologies. Moreover, consistent maintenance and upgrading of ICT tools, including replacing old or defective gadgets and ensuring reliable internet connectivity, are essential. Additionally, upgrading ICT infrastructure in libraries is necessary to provide access to electronic databases and online resources for academic work, administration/management, finance and students services.

College principals and management should prioritize ICT infrastructure, ensure consistent power supply, and seek assistance from affiliated universities for ICT accessories. Such comprehensive efforts will significantly enhance the development and utilization of ICT in Ghanaian colleges of education.

Conclusion

The study indicated that a high level of usage of ICT among the teaching and non-teaching staff in the colleges of education in respect to teaching, research, administration/management and finance highlighting its importance in modern educational environments. Most of the staff rely on laptops/desktop computers and use widely recognized tools like MS Word, PowerPoint Even though there was availability of computers and essential software, challenges such as inadequate ICT infrastructure, unreliable internet connectivity, and frequent power interruptions hinder optimal utilisation. The majority of the respondents had received some form of ICT training and reported that it was adequate. They, however, indicated that there was the need for continuous professional development in ICT to keep pace with technological changes and advancements. Staff emphasized

the need for significant improvements in ICT infrastructure, including the provision of more computers, better internet connectivity, and reliable power supply

Recommendations

The Colleges should consider increasing the number of computers, projectors, and other essential ICT tools across departments and offices, and modernize existing facilities with state-of-the-art equipment to support teaching, research and administration/management and finance.

Investments in robust internet infrastructure should be made to ensure stable and high-speed connectivity throughout the colleges by collaborating with reliable Internet Service Providers (ISPs) and ensuring consistent power supply for the ease of use of the ICT by the staff.

Training sessions, workshops, and seminars should be organised for teaching and non-teaching staff to enhance their ICT/digital skills, covering topics from basic computer literacy to advanced software applications. The Colleges should establish regular maintenance schedules and strict replacement protocols for defective ICT equipment and provide accessible technical support to minimize downtime. Foster stronger collaboration between college management, mentoring universities and ICT units to align strategic objectives and operational needs, and also develop comprehensive ICT policies to address usage standards and infrastructure development.

The College Libraries should be equipped with the needed ICT tools/equipment/gadgets and internet connectivity to support access to electronic databases and promote the use of virtual libraries.

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