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THE UTILIZATION OF TECHNOLOGY FOR THE TEACHING-LEARNING PROCESS AT CICOSAT COLLEGES

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ABSTRACT

The utilization of technology for the teaching-learning process involves integrating digital tools, resources, and platforms into educational settings to enhance the learning experience. This includes the use of Learning Management Systems (LMS), multimedia presentations, online collaboration tools, and various educational software. The goal is to improve student engagement, motivation, and academic performance while also aiding teachers in delivering effective instruction. Technology in education can provide personalized learning experiences, facilitate access to information, and support innovative teaching methods. This study examines the utilization of technology in the teaching-learning process at CICOSAT Colleges, focusing on its impact on student motivation, engagement, faculty motivation, and overall effectiveness, as well as the challenges encountered. The research aims to determine the effects of technology on classroom-based learning by addressing key questions related to the level of technology utilization, its effectiveness in enhancing motivation and engagement, the challenges faced in technology integration, and proposed measures for improvement. The findings reveal that technology significantly enhances both student and faculty motivation and engagement by creating technology-supported environments tailored to diverse learning styles. However, challenges such as inadequate internet connectivity and insufficient technological facilities impede effective technology integration and negatively impact the quality of education. Despite these challenges, the study shows that the utilization of technology has a positive impact on the educational process. In conclusion, the integration of technology in the teaching-learning process at CICOSAT Colleges significantly enhances student motivation and engagement, as well as faculty motivation. The use of diverse digital applications allows teachers to create a learning environment aligned with students' learning styles, fostering constructive and interactive learning experiences. However, challenges such as limited internet connectivity and technological resources hinder the effective use of technology, impacting both students' and faculty members' ability to perform tasks efficiently and affecting the quality of education. Thus, the study recommends that CICOSAT Colleges provide vital technologies, such as maintaining computer labs and offering laptops and tablets, to support students' academic success. Continuous innovation and training should be prioritized, with efforts to advance technology interventions and enhance teacher training on new technologies. Additionally, ongoing professional development for educators, the implementation of alternative learning strategies, and sustained collaboration are essential for creating an effective learning environment that maximizes the benefits of technology. This study underscores the importance of integrating technology into education and offers actionable recommendations to enhance its utilization at CICOSAT Colleges.

KEYWORDS: *Technology Integration, Student Engagement, Teaching Effectiveness*

I.INTRODUCTION

1.1 Rationale

The integration of technology into education has revolutionized teaching and learning processes, enabling personalized, interactive, and efficient pedagogical practices. Learning Management Systems (LMS), multimedia tools, and collaborative platforms such as Google Classroom empower educators and students to access resources, engage in real-time discussions, and enhance overall academic performance. At CICOSAT Colleges, the shift towards technology-driven instruction is aligned with global educational trends, especially following the challenges posed by the COVID-19 pandemic. Despite these advancements, barriers such as inadequate infrastructure, insufficient training, and resource disparities persist, necessitating a thorough investigation into how technology can be better utilized.

1.2 Research Objectives/Questions

This study aims to evaluate the extent of technology utilization in the teaching-learning process and its impact on student and faculty engagement. Specifically, it seeks to answer the following questions:

1. What is the level of utilization of technology in the teaching-learning process at CICOSAT Colleges?
2. How effective is technology in enhancing student motivation, engagement, and faculty motivation?
3. What challenges are encountered in integrating technology into teaching and learning?
4. What measures can improve technology utilization at CICOSAT Colleges?

1.3 Theoretical Background

This study draws upon Constructivism (Piaget, 1955) and Connectivism (Siemens, 2003):

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- Constructivism emphasizes learning as an active process where knowledge is built through experience. Technology supports constructivist learning by enabling collaborative, real-world problem-solving activities.
- Connectivism highlights the role of technology and networks in facilitating knowledge acquisition. Tools like LMS allow learners to access vast resources and engage in continuous, connected learning.

1.4 Literature Review

Research highlights the transformative potential of technology in education. According to Bradley (2021), LMS platforms foster collaborative and autonomous learning. Kunter et al. (2013) emphasize that educators' enthusiasm in using technology directly impacts student engagement and learning outcomes. However, studies by Edwards (2009) and Muilenburg & Berge (2015) point to systemic barriers, such as resource shortages and digital illiteracy, which hinder effective technology integration.

II.METHODOLOGY

2.1 Research Design

This study employed a mixed-method explanatory sequential design:

1. Quantitative Phase: Surveys assessed technology utilization, effectiveness, and challenges.
2. Qualitative Phase: Semi-structured interviews explored the contextual factors influencing technology integration.

2.2 Research Locale

The study was conducted at CICOSAT Colleges, San Fernando, La Union, involving three departments: CCJE, HM/BA, and Pharmacy. The institution's adoption of LMS and other platforms provided an ideal context for evaluating technology utilization.

2.3 Data Measure/Instruments

1. Survey Questionnaire:
   - Likert-scale items captured data on technology utilization, effectiveness, and challenges.
2. Interview Guide:
   - Validated by experts to ensure clarity and relevance, focusing on barriers and proposed solutions.

2.4 Data Gathering Procedures (with Ethical Guidelines)

- Participants were informed about the study's purpose, and informed consent was obtained.
- Surveys were distributed to 333 students and 35 faculty members.
- Interviews were conducted with a subset of participants to collect qualitative data.
- Confidentiality and anonymity were maintained, adhering to ethical research standards.

2.5 Data Analysis

- Quantitative Data: Weighted mean was used to analyze survey responses, categorizing results into descriptive equivalents.
- Qualitative Data: Thematic analysis identified recurring themes such as resource gaps, training needs, and connectivity issues.

III.RESULTS AND ANALYSIS

Presentation/Report on the Results or Findings

Table 1: Level of Technology Utilization

Dimension	Weighted Mean	Descriptive Equivalent	Key Observations
Student Motivation	3.20	Moderately Utilized	Teachers effectively use multimedia tools, but resource disparities exist.
Student Engagement	3.31	Fully Utilized	Group chats, digital content sharing, and LMS tools are widely adopted.
Faculty Motivation	2.89	Moderately Utilized	Limited access to tools affects collaboration and training opportunities.

Table 2: Challenges in Technology Integration

Challenge	Frequency (Students)	Frequency (Faculty)	Key Observations
Poor Internet Connectivity	64%	52%	Affects virtual classes and delays access to digital resources.
Insufficient Technological Tools	60%	52%	Resource shortages limit engagement.
Low LMS Proficiency	35%	40%	Inadequate training hinders effective utilization.

Analysis of the Results/Findings

The findings indicate that while technology moderately enhances motivation and engagement, systemic challenges constrain its effectiveness. Poor internet connectivity emerged as the most significant barrier, followed by insufficient access to devices and training gaps. Thematic analysis of interview responses revealed that participants perceive technology as a valuable tool but lack the necessary support systems to maximize its potential.

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IV.DISCUSSION

The study underscores the potential of technology to transform education by fostering collaboration, motivation, and engagement. However, its effectiveness is contingent on addressing infrastructural and systemic barriers.

Comparison with Other Studies

The findings align with Kunter et al. (2013), who emphasized the role of enthusiastic and resource-supported teaching in improving engagement. Similarly, Bradley (2021) highlighted the benefits of LMS in promoting autonomous learning, echoing the results observed at CICOSAT Colleges.

Some participants reported moderate satisfaction with technology, which may stem from variability in digital literacy levels and the uneven availability of resources.

Practical Implications

The results suggest the need for targeted investments in infrastructure, training programs, and equitable access to resources to enhance the teaching-learning process.

Recommendations

Table 3: Recommendations for Improving Technology Utilization

Challenge	Objective	Proposed Solution	Responsible Parties
Poor Internet Connectivity	Ensure reliable access	Upgrade internet infrastructure and provide connectivity tools.	School Administration, IT Department
Insufficient Resources	Bridge resource gaps	Allocate funds for laptops, tablets, and multimedia tools.	Management, Department Heads
Low LMS Proficiency	Enhance digital literacy	Conduct workshops on LMS functionality and multimedia integration.	HR, Faculty Development Units
Technical Issues	Minimize disruptions	Establish IT help desks and provide troubleshooting guides.	IT Support Staff

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