Role of ICT in Indian Education System and how does it Impact the Student's Learning

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Abstract
Information and Communication Technology (ICT) significantly enhances the wellbeing of marginalized individuals by substantially improving their personal and social capabilities. ICTs possess the ability to elevate both individual and collective engagement among the impoverished, facilitating access to information and resources. The gradual integration of diverse and advancing technologies is reshaping work and various activities. Despite certain challenges, the incorporation of ICTs into the educational framework has expanded across all levels, providing solutions to numerous issues that could facilitate the integration of ICTs aimed at enhancing educational quality. ICTs are recognized as agents of transformation, influencing information management and dissemination, modifications in working conditions, pedagogical approaches, educational strategies, and scientific inquiry, among other areas. Through ICT, educators can deliver instruction to students at various academic levels in a manner that is both engaging and easily comprehensible. Consequently, online training initiatives in India are increasingly advantageous and attractive. While ICTs yield both positive and negative effects on student learning and education, those who are genuinely committed to utilizing ICTs for educational purposes stand to benefit in the digital age. The Internet and interactive multimedia are two ICTs that are evidently central to the future of education and must be effectively integrated into the formal teaching and learning framework.

Keywords: ICT, ICT in Teaching, Technology in Education, ICT in Education, Roles of ICT, ICT &Education, Online Education, Virtual Trainings, Online Courses

Introduction

Information and Communication Technologies (ICT) encompass a range of electronic devices, including computers and internet connections, utilized for the management and dissemination of information for educational purposes. As noted by Ghosh (2017), ICT has emerged as a pivotal topic in both national and international dialogues within the digital era. Furthermore, ICT has become integral to nearly every sector, particularly in education, where it is influencing the future landscape of teaching, learning, and assessment in India. E-learning, which encompasses online education across various levels—formal and informal—occurs through information networks such as the Internet, local area networks (LAN), or wide area networks (WAN). Key components of this ecosystem include e-portfolios, cyber infrastructures, digital libraries, and repositories of online learning objects. In 2009, the Indian ICT sector accounted for 5.9% of the country's GDP and export revenues, employing a significant portion of the tertiary workforce. With approximately 2.3 million individuals engaged directly or indirectly, this sector serves as a crucial employer and foundation of the Indian economy (AICTE, 2021). However, challenges such as limited access to computers and software, inadequate time for course development, and insufficient technical and

DOI: https://doi.org/10.5281/zenodo.15532180

administrative support remain prevalent (Chen, 2008). The term 'Information and Communication Technology' signifies the widespread adoption of electronic delivery methods in contemporary education, including radios, televisions, and projectors. Effective utilization of ICT is posited as a means to enhance educational quality and better align classroom learning with real-world applications, as supported by various studies (Lowther, Inan, Strahl, & Ross, 2008); (Weert & Tatnall, 2005) characterize learning as a lifelong process that involves the transformation of the learner's expectations through the acquisition of knowledge, distinguishing it from more conventional educational approaches.

As noted by Castro Sanchez and Aleman (2011), the incorporation of digital tools within educational settings fosters a student-centered learning environment. In ICT classrooms, students are encouraged to take an active role in their education, enabling them to make choices, formulate plans, and partake in various related activities, as highlighted by Lu, Hou, and Huang (2010).

The Importance of Information and Communication Technology in Teacher Education

The teaching profession holds significant prestige within society. Information and Communication Technology (ICT) empowers educators to remain informed about the latest knowledge and skills necessary for effectively employing new digital tools and resources. By engaging with and mastering ICT, student teachers are poised to become effective educators. ICT serves as a fundamental catalyst for the rapid evolution of our society, possessing the capacity to transform the educational landscape and redefine the roles of both students and teachers within the learning environment. In India, educators have started to incorporate technology into their classrooms, with tools such as laptops, LCD projectors, desktop computers, EDUCOM systems, smart classrooms, and USB drives becoming increasingly prevalent in teacher training programs. Therefore, it is imperative that we integrate information and communication technology into teacher education in the twenty-first century, as teachers are uniquely positioned to offer students a promising future (Bhattacharjee & Deb, 2016).

The Significance and Utilization of ICT in the Field of Education

Information and communication technology (ICT) serves as a vital tool for the responsible search, exploration, analysis, exchange, and presentation of information without discrimination. By leveraging ICT, users can instantly access a wealth of ideas and experiences from a wide array of individuals, communities, and cultures (aicte-india.org, 2022). Acknowledging the significance of ICT, the Ministry of Human Resource Development has recognized it as an essential educational resource that aims to elevate the current higher education enrollment rate from 15% to 30% by the conclusion of the 11th Plan period, as outlined in the Mission Document (aicte-india.org, 2022). Furthermore, the Ministry has introduced a comprehensive 'One Stop Education Portal' named Sakshat, which will encompass all disciplines and subjects. Numerous initiatives are approaching completion and are poised to transform the landscape of education in India (aicte-india.org, 2022).

The integration of technology and educational advancement is inseparable, particularly in contemporary society. Over the past thirty years, various electronic devices have been observed within educational settings. The prevalence of mobile phones and internet access illustrates the extent to which technological tools have become essential in our daily lives. Digital technologies are acknowledged as crucial instruments for fostering meaningful education in the twenty-

DOI: https://doi.org/10.5281/zenodo.15532180

first century (Norhayati & Siew, 2004) (Peeraer & Van Petegem, 2011). The growing reliance on technology has led to competitive economies, knowledge-driven societies, and enhanced creative educational processes (Nasab & Aghaei, 2009) (Fong, 2009) (Poorfaraj, Samimi, & Keshavarz, 2011). Moreover, the current generation exhibits a notable familiarity with a diverse array of digital technologies in their everyday experiences (Robertson, Fluck, & Webb, 2007). Consequently, educators are now compelled to enhance their own skills to effectively instruct these technologically adept students (Smolin & Lawless, 2007); (Robertson, Fluck, & Webb, 2007). Teachers are required to become proficient in and incorporate it into their pedagogical approaches. Previous research has indicated that technology positively influences student engagement and outcomes, particularly in English language classes (Szendeffy, 2005); (Lee, George, & Lai, 2005); (Townrow, 2007). Other investigations have focused on specific areas such as second language acquisition (Chapelle, 2001); communication (Warschauer & Kern, 2000), or professional language education (Arno, Soler, & Rueda, 2006), among others. Nevertheless, despite the latest advancements in language teaching technologies, including specialized websites, blogs, wikis, and various teaching methodologies, technology continues to evoke concern and apprehension among many educators globally (Farooq & Soomro, 2018).

Information and communication technology (ICT) in the educational sector encompasses the use of computers, communication tools, and functionalities that facilitate teaching, learning, and various educational endeavors. ICT is essential for optimizing processes, minimizing lead times, fostering collaboration among diverse teams and organizations, enabling real-time data and information exchange, enhancing visibility, promoting operational efficiency and transparency, aiding in strategic decision-making within supply chains, and improving overall supply chain performance at all levels (Singh, Sarupria, Kushwaha, & Kumari, 2019a); (Singh, Singh, & Kumari, 2020b). The implementation of ICT is particularly significant in the realm of education, especially in the context of business communication in the English language. A report by the World Bank (2019) recommended that developing nations invest in their populations, particularly in education, to equip them for adapting to emerging technologies and innovations, thereby enabling them to compete in the future economy. Education is not only crucial for preparing individuals for the knowledge economy (Laurillard, Oliver, Wasson, & Hoppe, 2009), but in a rapidly evolving and knowledge-driven world, countries that successfully integrate advanced information and communication technologies across all aspects of life are pivotal contributors to economic growth (United Nations, 2020).

The significance of this study

This paper addressing the evolving classroom dynamics, which reveal a disconnect between social development and traditional teacher-led education. Presently, instruction is often delivered in a dated, teacher-centered approach that tends to be uninspiring and fails to engage students effectively. In contrast, contemporary education emphasizes a student-centered paradigm, where learners draw knowledge from diverse sources. This shift underscores the critical role of Information and Communication Technology (ICT) and multimedia in education, necessitating educators' proficiency in these areas. Consequently, this research is vital as it highlights the importance of ICT in teacher education (Bhattacharjee & Deb, 2016) and discusses its relevance within the context of school culture. This review also identifies existing gaps in the literature and proposes future research avenues to address these deficiencies (Fu, 2013). The research objective is thus articulated to investigate the Role of

DOI: https://doi.org/10.5281/zenodo.15532180

ICT in Indian Education System and how does it Impact the Student's Learning.'

Research Objective:

1) An examination of the significance of Information and Communication Technology in the field of education.
2) Examine the significance of information technology within the Indian educational framework.
3) To examine the principles underlying the influence of information technology on the educational framework in India.
4) Utilizing secondary data derived from the research article to draw significant conclusions.

Literature Review

Information and Communication Technology (ICT) has significantly influenced various aspects of our lives, leading to a consumer-driven technological landscape. Technology has become an indispensable element of our existence, firmly establishing its presence in our daily routines. Whether through computers, plasma televisions, or mobile phones, individuals have engaged with ICT in diverse ways. In contemporary society, there is a collective desire among ICT users to lead interconnected lives, making ICT a lifestyle choice for a considerable portion of the population. This choice not only accelerates consumption patterns but also transforms our methods of interaction and information acquisition. Furthermore, the concept of a 'blended approach to education' refers to pedagogical methods that integrate both online and traditional classroom learning. For example, an educator might enhance classroom instruction while simultaneously employing a modular object-oriented dynamic learning environment (MOODLE) to support learning beyond the classroom. To meet the demands of modern educators seeking to effectively incorporate ICT into their teaching practices, a comprehensive teacher training program is essential. It is crucial to focus on the specific roles of ICT in providing multimedia simulations of effective teaching methodologies, offering personalized training courses, helping educators combat feelings of isolation, continuously connecting individual teachers to a broader educational community, and fostering collaboration among teachers. Additionally, both the intended and unintended effects of implementing ICT for the professional development of teachers warrant thorough investigation. (Ratheeswari, 2018) Facilitate students in the effective and efficient acquisition of digital information, as ICT serves as a resource for exploring educational topics, addressing challenges, and proposing solutions within the learning framework, as noted by Brush, Glazewski, and Hew (2008). The integration of ICT enhances the accessibility of knowledge acquisition and fosters a deeper understanding of concepts across various learning domains. Students are increasingly engaged in purposeful computer usage (CastroSanchez & Aleman, 2011), enabling them to create new knowledge through the processes of accessing, selecting, organizing, and analyzing data and information. Those who utilize ICT in their learning are more adept at leveraging knowledge and data from diverse sources while critically assessing the quality of educational resources. Furthermore, ICT contributes to a more profound understanding of their subjects (Chai, Koh, & Tsai, 2010). Various types of learning inquiries can be approached with greater creativity through ICT. For instance, in a reading class, e-books are commonly employed during read-aloud activities. Koc (2005) highlights that students not only acquire knowledge collectively but also exchange a range of learning experiences to articulate and reflect on their learning.

The integration of Information and Communication Technology (ICT) with constructive learning methodologies enables students to focus on advanced concepts rather than trivial tasks (Levin & Wadmany, 2006).

DOI: https://doi.org/10.5281/zenodo.15532180

McMahon (2009) identified statistically significant correlations between the use of ICT in education and the enhancement of critical thinking skills. Prolonged engagement with ICT is beneficial for the development of robust critical thinking abilities in children. Lowther, Inan, Strahl, and Ross (2008) highlighted three essential characteristics necessary for effective ICT-based teaching and learning: autonomy, capability, and creativity. Students who engage with ICT to take control of their educational journey are considered autonomous learners. Consequently, they become more adept at working both independently and collaboratively. ICT fosters autonomy by enabling educators to create their own instructional materials, thereby granting them greater authority over the curriculum compared to traditional classroom settings. This empowerment enhances students' confidence and stimulates their creativity (Serhan, 2009; Watts-Taffe, Gwinn, & Horn, 2003). They can explore various multimedia tools and produce content in formats that are readily accessible to them through games, CDs, and television (Gee, 2007a; Gee J., 2011b).

Reid (2002) emphasized that Information and Communication Technology (ICT) enables students to engage more deeply with subjects beyond the basic course material. The integration of ICT also transforms the relationship between teaching and learning. While previous research has highlighted the advantages of implementing ICT in educational settings, challenges and limitations persist regarding its integration. According to Frederick, Schweizer, and Lowe (2006), the main challenges associated with ICT usage include student mobility, accommodating special needs, and concerns regarding performance on standardized tests. These challenges can be mitigated through more authentic group and problem-based learning experiences, along with adequate learning support (Whelan, 2008). From the perspective of students, Whelan (2008) identified additional limitations, such as inadequate technical skills that hinder access to ICT in educational environments. Castro Sanchez and Aleman (2011) also recommend that students cultivate specific technical competencies to facilitate their learning in ICT contexts. Tezci (2011a) argues that educators should not only learn to use technology to enhance traditional teaching methods or increase efficiency but also to integrate ICT into classroom activities to foster student-centered learning. This necessitates that educators adopt more innovative and effective approaches in their use of ICT to create engaging and meaningful learning experiences (Birch & Irvine, 2009; Honan, 2008). Consequently, Castro Sanchez and Aleman (2011) suggest that teachers maintain an open attitude towards the incorporation of ICT in their classrooms. It is essential for educators to master new pedagogical strategies when utilizing technology to adapt to these new tools.

Yildirim (2007) found that educators are more inclined to use information and communication technology (ICT) for the preparation of handouts and assessments rather than for fostering critical thinking. In a similar vein, Palak and Walls (2009) noted that teachers predominantly apply technology to enhance their existing instructional methods instead of facilitating student-centered learning. The authors suggest that this trend may stem from a deficiency in models demonstrating how to effectively leverage technology for educational purposes, compounded by contextual limitations such as class size and varying student abilities. Furthermore, Brush, Glazewski, and Hew (2008) revealed that teacher training programs often fail to equip educators with sufficient ICT knowledge necessary for technology-enhanced education, nor do they adequately present effective strategies for integrating technology into the curriculum. To successfully implement technological strategies, it is essential to

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provide additional training within the pre-service teacher curriculum, and to ensure that ICT skills are actively utilized in the classroom (Supon & Ruffini, 2009). Chen (2008) suggested that ICT researchers should not only focus on educational theories but also document examples of how teachers successfully integrate technology to meet their pedagogical goals and address the challenges they face.

Beyond the challenges faced by students and educators in the integration of Information and Communication Technology (ICT), there exist additional obstacles related to administrative and ICT infrastructure. Insufficient administrative support for the effective utilization of ICT (Lim, 2007), coupled with administrative pressures to enhance examination outcomes, diverts attention from employing ICT to foster higher-order thinking among students (Yildirim, 2007; Goktas, Yildirim, & Yildirim, 2009). Schools must ensure adequate technical access to mitigate these challenges (Yildirim, 2007). Furthermore, it is imperative to establish new policies and institutional frameworks that involve teachers in the decision-making and planning processes regarding ICT. The findings suggest that access to ICT resources, the formulation of disciplinary and educational guidelines, and the equitable distribution of responsibilities among educators, teaching assistants, and students are critical for the establishment of a well-organized ICT-integrated classroom (Lim, 2007). However, a robust connection between theoretical knowledge and practical application is essential to assist teachers in navigating the complexities of technology integration (Keengwe & Onchwari, 2009). Effective planning for technology integration, as noted by Staples, Pugach, & Himes (2005), necessitates a comprehensive understanding of the specific hardware and software pertinent to the curriculum.

Information and Communication Technology (ICT) is integral to all facets of contemporary society. It has transformed our methods of communication, information retrieval, employment, commerce, engagement with governmental entities, and the management of our social interactions. Given its significant influence on daily life, ICT also affects macroeconomic growth, which subsequently impacts societal advancements through enhancements in infrastructure and living standards (Roztocki, Soja, & Weistroffer, 2019). Furthermore, ICT has been pivotal in the evolution and integration of global economies, facilitating the creation of international products for trade in foreign markets. Organizations depend on ICT for efficient communication, data management, and market analysis (Singh, Sarupria, Kushwaha, & Kumari, 2019a); (Singh, Singh, & Kumari, 2020b); (Roztocki, Soja, & Weistroffer, 2019); (Pourhossein Gilakjani, 2013). Additionally, ICT has been crucial across various industries, aiding businesses in streamlining operations, reducing costs, enhancing profit growth, and sustaining a competitive edge in both local and global markets (Singh, Sarupria, Kushwaha, & Kumari, 2019a); (Singh, Singh, & Kumari, 2020b).

Information and Communication Technologies (ICTs) are now integral to nearly every sector, including communication, digital education, virtual meetings, governance, technological progress, the enhancement of human rights, agricultural and medical advancements, supply chain management, logistics, and the facilitation of daily life (Singh, Singh, & Kumari, 2020; Roztocki, Soja, & Weistroffer, 2019). One of the most significant advantages of ICT is the emergence of innovative and engaging employment opportunities within the IT sector, with the possibility of obtaining degrees online from the convenience of one's home (Roztocki, Soja, & Weistroffer, 2019; Singh, Singh, & Kumari, 2020).

As noted by Nadim Ahmad (2004), ICT serves as the foundation for every industry across the

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globe, effectively reducing transaction costs and enhancing productivity. It facilitates immediate connectivity, whether through visual or auditory means, while also promoting efficiency, transparency, and accuracy within systems (Nadim Ahmad, 2004; Leonard Waverman, 2005). The positive and significant influence of investments in mobile telecommunications and information technology on GDP has been demonstrated, benefiting not only developed nations but also those in the developing world (Dherange, 2013). Reports indicate that ICT profoundly impacts human existence, leading to a transformative shift in the global economy and society towards a 'knowledge society.' This encompasses any product capable of electronically storing, retrieving, manipulating, transmitting, or receiving information in a digital format (Bethapudi, 2013). It has been concluded that ICT lowers costs, enhances two-way communication with customers, increases flexibility, provides instant feedback, boosts efficiency, and reduces operational expenses, among other benefits (Nair, April-June 2019). The functional roles of ICT include transaction execution, collaboration and coordination, and decision support.

In their 2014 study, Tri and Thi Nguyen discovered that over half of the participants (55%) reported using ICT for non-educational purposes for more than twenty hours per week. Nearly 30% indicated they spent between six to fifteen hours weekly, with 12.8% dedicating six to ten hours and 16.8% committing eleven to fifteen hours. The interactive teaching and learning process is initiated by a philosophy that integrates technology into education and culminates in a novel approach to interactive pedagogy. Educators are responsible for designing, delivering, and executing integrated instructional sequences. Constructivism, a philosophy of learning and knowledge creation, posits that learners actively engage in interpreting their surroundings and experiences (Vygotsky, 1978; Abdal-Haqq, 1998). Teachers generally perceive that ICT facilitates more advanced forms of learning.

The research identified specific methods for integrating Information and Communication Technology (ICT); however, Facility Managers (FMs) struggled to grasp the latest advancements in ICT within the educational sector. As noted by Islam et al. (2019), the resources provided by institutions significantly influence university educators' willingness to adopt ICT. Additionally, Tran et al. (2020) suggested that the ICT competencies of FMs are linked to the integration opportunities offered by an institution, which encompasses ICT infrastructure, including hardware, software, instructional materials, technical support, and professional development. Analysts have observed that Saudi culture has experienced considerable transformations in recent years, largely due to the proliferation of modern technologies and educational advancements (ESTIMO JR., 2014). The primary forms of communication technologies that have facilitated the ease of communication include the telephone, radio, television, and internet (Novak, 2019).

Early forms of communication included cave paintings, smoke signals, symbols, carrier pigeons, and the telegraph. In contrast, contemporary methods are significantly more efficient and user-friendly. Examples of these modern techniques encompass television, mobile phones, the internet, email, social media, video conferencing, virtual meetings, and instant messaging. The advancement of technology has provided new avenues for enhancing the educational process, allowing educators to create innovative learning environments that promote interactivity (Sessoms, 2008). Establishing such interactive settings is essential as learners progress and information becomes increasingly accessible to all (Farooq & Soomro, 2018). Consequently, educators are required to become proficient in utilizing advanced technology and integrating it into their pedagogical approaches. Research

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has consistently shown that technology positively influences student engagement and initiatives, as well as the effectiveness of instruction in English classes (Brierley, 1991; Sabourin, 1994; Boswood, 1997; Beatty, 2003; Szendeffy, 2005; Lee, George, & Lai, 2005; Towndrow, 2007).

Research Methodology

A research design refers to a systematic approach for employing empirical data to address a specific research question. The process of developing a research design involves making decisions about overarching goals and methodologies. It also determines the sampling methods or criteria for selecting subjects. Figure 1 provides an overview of the research design. In this study, which examines the roles of Information and Communication Technology (ICT) in the Indian Education System, a descriptive and analytical research approach was adopted. This necessitates a clear definition of the participants (university students, educators, and ICT specialists), the focus of the study (the roles of ICT), the rationale behind the research (identifying gaps), and the methodology employed (survey).

Sampling Technique

The sampling method employed in this research was random sampling, selected for its convenience to the researchers.

Data Collection

Data were gathered using a meticulously crafted questionnaire administered in English through an interview schedule, employing various ICT tools. The survey aimed to investigate the role of ICT within the Indian education system, collecting responses from 35 universities, which included central universities, state government universities, and private institutions recognized as deemed universities. Although the objective was to obtain data from a minimum of 500 participants, resource limitations necessitated a reduction to 260 participants (N=260). The research encompassed seven Indian states: Odisha, Madhya Pradesh, Rajasthan, Gujarat, Bihar, Punjab, and Chhattisgarh, utilizing a questionnaire for data collection.

Data Analysis

Data analysis involves the systematic examination, filtration, modification, and modeling of data to extract pertinent information, formulate recommendations, and facilitate informed decision-making. Through data analytics, we can eliminate uncertainty and make well-informed choices (Directionsmag, 2018). The raw data was assessed using MS Excel. The primary objective of this analysis was to assess the current roles of Information and Communication Technology (ICT) within the Indian educational framework. As noted by (Analyticsfordecisions.com), the significance of data analysis in research stems from its accessibility and efficiency. It enables researchers to easily interpret data, ensuring that no critical insights are overlooked that could aid in drawing conclusions. Analyzing any data set is crucial as it supports decision-making processes. The ultimate aim of the analysis is to ascertain whether the outcomes are favorable or unfavorable. The final result and its interpretation form the essence of the technical report. This research aims to statistically summarize the gathered data and present it in graphical, tabular, or other pertinent formats. The results are depicted in Table-1 below:

Q. 1 Do you believe that information and communication technology tools such as the Internet, mobile devices, laptops, and Kindles can enhance your English communication skills?

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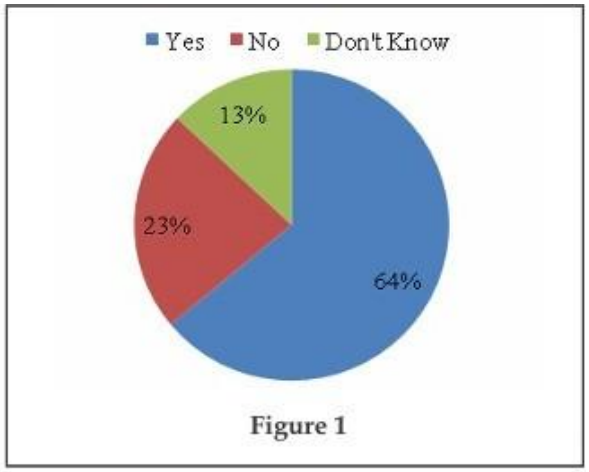

Figure 1

As illustrated in Figure-1, the analysis indicates that a significant majority (64%) of students believe that ICT tools can enhance English communication, whereas 23% hold a contrary view. The effectiveness of ICT tools in improving English communication is contingent upon their appropriate utilization and the implementation of a focused approach in educational activities (Hammond & Gamlo, April 2015; Brierley, 1991; Sabourin, 1994; Boswood, 1997; Beatty, 2003; Szendeffy, 2005).

Q. 2 - Do you believe that ICT tools possess the capability to enhance your understanding?

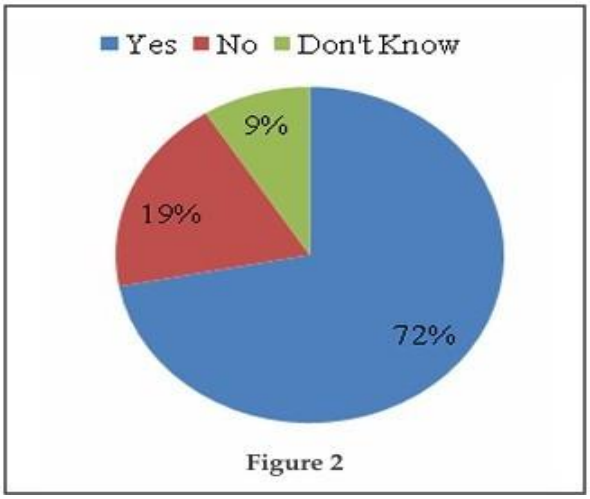

Figure 2

According to Figure-2, over 70% of students believe that ICT tools can enhance knowledge, while only 19% express disagreement, and the rest remain neutral. The growing integration of technology has led to more competitive economies, knowledge-driven societies, and an enhanced framework for creative education (Nasab & Aghaei, 2009) (Fong, 2009) (Poorfaraj, Samimi, & Keshavarz, 2011).

Q. 3 - Do you believe that your educators promote online learning or e-learning?

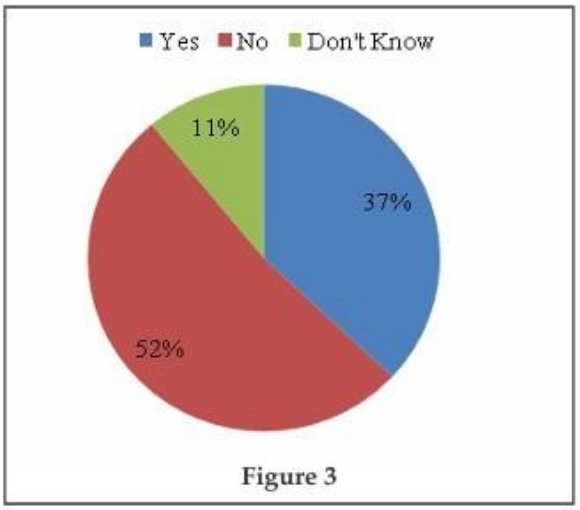

Figure 3

According to Figure-3, nearly 52% of students express disagreement regarding their teachers' encouragement of online learning or e-learning, while approximately 37% of teachers do promote such methods, leaving 11% of students without a definitive opinion. E-learning, as a form of digital education, significantly enhances the ease of human life (Singh, Singh, & Kumari, 2020; Roztocki, Soja, & Weistroffer, 2019), and therefore, it is imperative that all stakeholders, particularly educators, advocate for its integration in classroom settings and assignments.

Q. 4 - Do you believe that Smart-phones impede the productivity of typical students in India?

DOI: https://doi.org/10.5281/zenodo.15532180

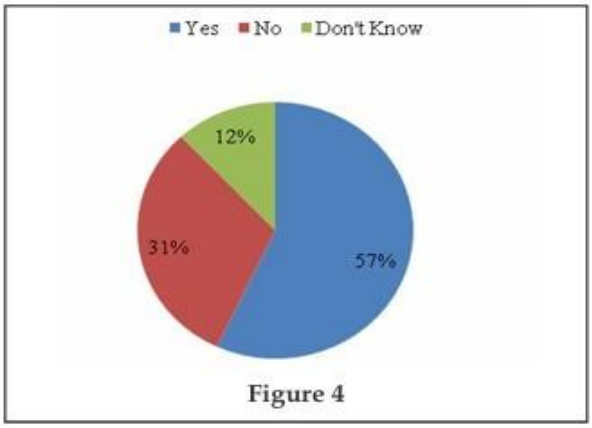

Figure 4

Q. 5 - What kind of content do you prefer to engage with on social media platforms using your Smart-phone?

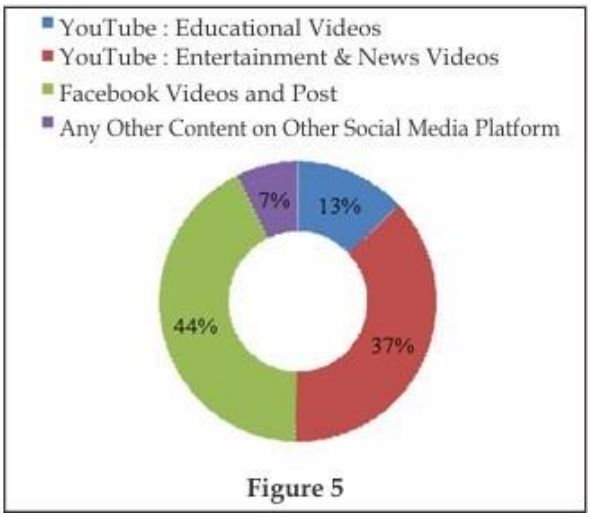

Figure 5

As illustrated in Figure 5, a significant 81% of students engage with entertainment and news content, including Facebook videos and posts, whereas a mere 13% utilize Smart-phones for educational purposes, a disparity that is concerning and necessitates immediate intervention. Research by Balachandran (2017), Duke and Montag (2017), and Hatun-Ataş and Çelik (2019) indicates that social media often serves as a time sink, leading to unproductive use of time. Furthermore, it poses potential health risks, including issues related to vision and mental well-being (News18, 2022).

Q. 6 – What is the daily duration of smartphone usage for social media and other information and communication technology tools?

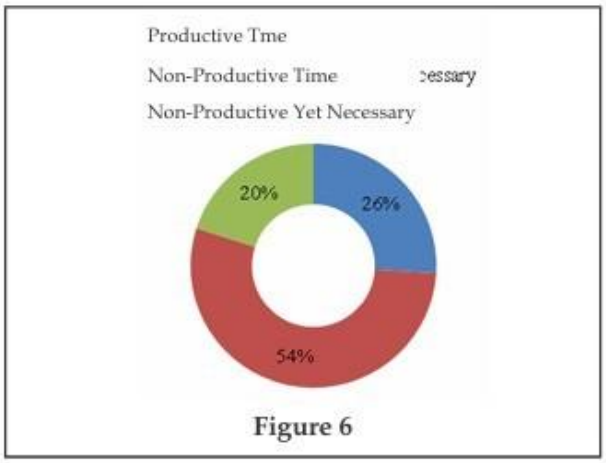

Figure 6

Q. 7: Are you offering any form of online educational course in addition to the standard curriculum?

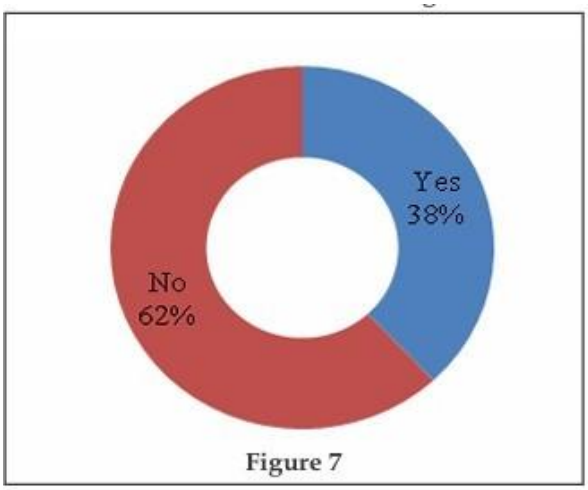

Figure 7

According to Figure 7, approximately 38% of students are participating in online educational courses in addition to their regular studies, while 62% rely solely on their traditional courses. This study indicates a significant potential for online education in India. Recent research (Muthuprasada, Aiswarya, Aditya, & Jha, 2021; OECD, 2020) shows that a substantial proportion of students have registered for online education, and the Indian

DOI: https://doi.org/10.5281/zenodo.15532180

government has introduced a new educational policy that endorses the online education system (Government of India, 2020).

Q. 8: Do you perceive that teaching an online course allows you additional time for other pursuits?

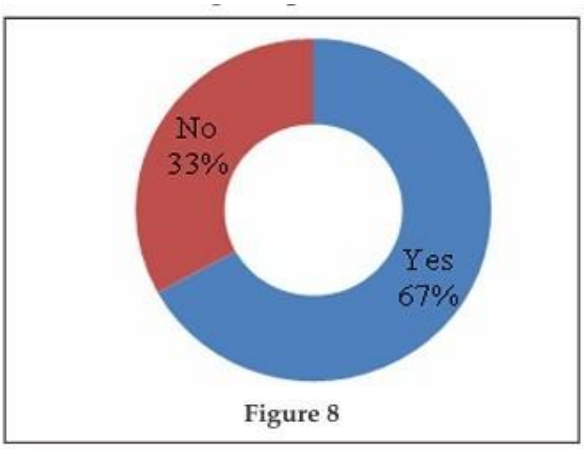

Figure 8

Refer to Figure 8, which indicates that approximately 67% of students believe they have additional time for extracurricular activities while engaging in online education, in contrast to 33% who feel they do not have such extra time. Research by Muthuprasada, Aiswarya, Aditya, and Jha (2021) and the OECD (2020) suggests that in online learning contexts where students experience increased opportunities for extracurricular involvement, academic performance is significantly influenced by favorable attitudes towards learning, self-regulation, and intrinsic motivation to study. Furthermore, it is essential to recognize that varying online learning strategies are required for different courses and age demographics (Pokhrel & Chhetri, 2021).

Q. 9: What is your favored mode of learning?

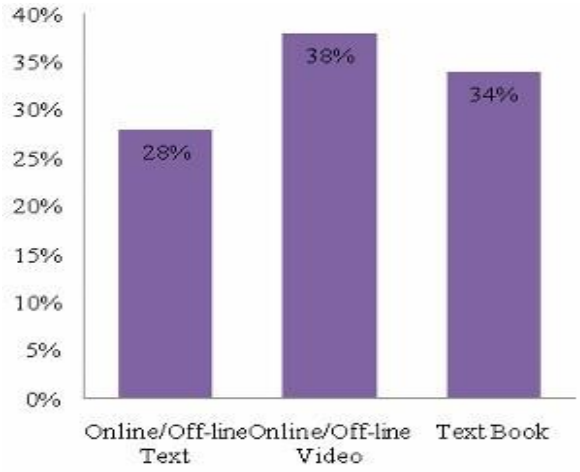

Figure 9

Figure 9 illustrates that 28% of students favor text-based resources, 38% prefer video content, and 34% rely on textbooks for their studies. The data indicates that a significant majority of students (70%) are willing to opt for online classes to navigate the curriculum during this pandemic. Furthermore, a large proportion of students expressed a preference for utilizing their smartphones for online learning (Muthuprasada, Aiswarya, Aditya, & Jha, 2021; Pechenkina & Aeschliman, 2017).

Q.10: Could you please specify the percentage distribution of teachers' preferred teaching methods in the classroom?

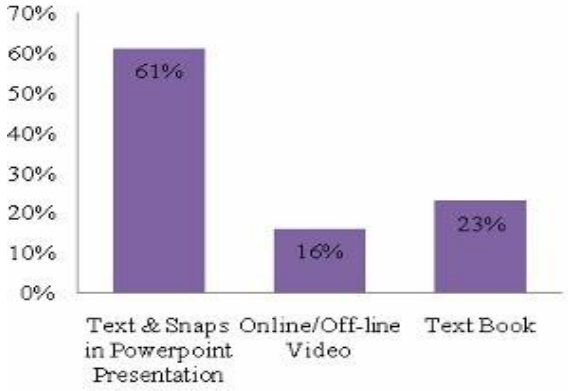

Figure 10

DOI: https://doi.org/10.5281/zenodo.15532180

As illustrated in Figure 10, 61% of educators favor the use of text and images in PowerPoint presentations, while 16% prefer online or offline videos and merely 23% opt for textbooks during classroom instruction. According to the Center for Innovative Teaching and Learning (CITL, n.d.), PowerPoint can serve as an effective medium for conveying information and enhancing student engagement. When designed and implemented effectively, PowerPoint can offer valuable strategies to enhance the educational experience (Center for Teaching & Learning, n.d.).

Findings

The integration of information and communication technology (ICT) in education is an undeniable reality, supported by substantial evidence that advocates for the adoption of these technologies in both online and traditional classroom settings. A significant number of students are utilizing ICTs in various forms to enhance their academic pursuits, and societal acceptance of these technologies has notably increased in educational and professional environments. Educators are increasingly incorporating ICT tools, such as PowerPoint presentations, into their teaching methodologies and are promoting their use in students' daily studies and preparation for competitive examinations. Students frequently employ smart-phones with internet access to view educational videos and live lectures pertinent to their subjects, as well as to read texts both online and offline. Additionally, online education allows students to allocate time for other preferred activities. A majority of students acknowledge that ICTs contribute to the enhancement of their English communication skills. Notably, 72% of students believe that information and communication technology has the potential to augment their knowledge. However, despite the numerous advantages, over 50% of students perceive Smart-phones as a distraction in their educational journey, as they can lead to excessive time spent on social media and other non-productive activities. Therefore, it is essential to adopt a focused approach when utilizing smart-phones for educational purposes. Like any tool, ICTs possess both advantages and disadvantages; thus, when leveraged effectively, they can be immensely beneficial.

Conclusion

Information and Communication Technologies (ICTs) are recognized as catalysts for various transformations, encompassing information management and dissemination, modifications in work environments, educational methodologies, scientific inquiry, and beyond. In diverse settings such as workplaces, businesses, educational institutions, and recreational activities, ICTs play a crucial role. Educators are tasked with fostering effective learning environments, as ICT enhances both teaching and learning processes. The integration of the Internet and interactive technologies into formal educational frameworks is imperative, given their significance for the future of education. ICTs possess the capacity to empower marginalized individuals and communities by enhancing their access to knowledge and resources. As technology continues to evolve and diversify, the nature of work and other pursuits is also undergoing transformation. Despite facing numerous challenges, the integration of ICTs in education has progressed across all levels, offering solutions to a variety of issues that could facilitate the incorporation of ICTs in educational contexts while simultaneously elevating the quality of education.

Recommendation

Online education is perceived to be more cost-effective than traditional classroom education, allowing many students who cannot afford the latter to pursue their studies through digital platforms. The importance of Information and

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Communication Technology (ICT) in the contemporary digital era is undeniable; therefore, this study advocates for the integration of ICT in educational settings and beyond. However, it is crucial that such technology is utilized judiciously to prevent students from deviating from their academic objectives.

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