Journal of Harbin Engineering University
ISSN: 1006-7043

Vol 44 No. 10
October 2023

Impact of ICT-Based E-Resources and E-Learning Platforms in Higher Education

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Abstract-Higher education is extremely crucial for a country's progress. It is an extremely effective tool for establishing a knowledge-based society. In the 21st century, we have come such a long way in terms of technological advancement. Pupils are deeply involved with numerous forms of technology in this age of modernization. Most higher education institutions nowadays place a high value on ICT in their teaching-learning methods, and they employ a variety of teaching-learning tools and platforms. Students accept work from teachers, discuss, share, and produce evidence of learning in the digital environment provided by an e-learning technology. Some systems are complicated and complex, whereas others are simpler to operate and have fewer functions. During the COVID-19 outbreak, e-learning systems have proven to be one of the most effective ways to assist students in continuing their education. Find out about the e-learning platforms that the government has set up for pupils until the schools close. The NEP 2020 has imposed a huge emphasis on digital and online learning as teaching and learning approaches. As a result, the focus of this research is on the diverse applications of ICT-based teaching-learning materials and platforms, as well as their significant effects on India's future generations.

Keywords: E-Platforms; E-Resources; ICT; NEP2020; Online Teaching; Self-paced and; Virtual Learning Environment

Introduction

The incorporation of Information and Communication Technology (ICT) in higher education has been a consistent aspect of educational strategies and frameworks. This approach particularly highlights the utilization of digital technology and online platforms (Davies, 2019). A notable aspect of this policy is its strong emphasis on digital and virtual learning. Presently, the growing desire for flexible learning options has led to a decline in the proportion of university students who favor ICT-driven education compared to the traditional in-person classroom setting (Ahmed, 2013). The advent of the Internet has fundamentally transformed both individual and institutional operations in contemporary society.

The influence of the Internet has brought about significant transformations in how libraries function and deliver services to their users (Digital LEARNING Network, 2019). In the present landscape, libraries are actively engaged in procuring, arranging, presenting, and lending out electronic editions of books, academic journals, newspapers, theses, and dissertations. This transformation is closely tied to shifts in user information-seeking behavior. Modern users exhibit a preference for online resources, as they seek comprehensive information readily accessible in one place. E-resources possess several intrinsic qualities that render them valuable to users.

An e-resource refers to a category of materials that necessitate computer-based access for utilizing their informational content. This classification encompasses both tangible and digital assets, including CD-ROMs. Any content disseminated by a library through a computer network falls under the e-resources umbrella (Davies, 2019). Within the realm of online information resources, often termed electronic resources, one encounters bibliographic databases, digital references, electronic books,

and collections of digital data. These resources encompass content that is both "born digital" and content generated directly for online platforms. Examples encompass e-journals, databases, and digitized versions of print materials (Digital LEARNING Network, 2019). Electronic resources can be available at no cost or involve a fee when accessed over the Internet. Instances of e-resources encompass magazines, encyclopedias, newspapers, scholarly journals, and the articles contained within them (Ahmed, 2013). These resources can be accessed through devices connected to the Internet, such as computers, tablets, and smartphones. Referred to as e-resources, these digital assets are easily accessible items in the contemporary information landscape.

Need And Significance of the Study

The state of the classroom is rapidly changing. A technical gap separates the growth of society and the multiple educational efforts of the educator in the classroom setting. If we take a good look at our culture, we can observe that technology is changing dramatically. On the other hand, the classroom setting is separate and far removed from the influence of information and communication technologies. Education has become more student-centered in the twenty-first century. Students are now having to learn from a wide range of sources, making the usage of ICT and multimedia in the field of education much more important, as is instructor mastery of ICT and multimedia. As a result, the current review is both necessary and important, as it demonstrates the impact of ICT-base de-resources and e-learning platforms in higher education.

Objective Of the Study

The objective of the present study is-

- To ascertain the functions of Information and Communication Technology concerning sources in the context of higher education.
- To determine the contributions of Information and Communication Technology in relation to e-learning platforms within higher education.

Review Of Related Literature

The cited studies collectively provide valuable insights into the integration of Information and Communication Technology (ICT) in education across diverse contexts. J. Enrique Hinostroza, Christian Labbé& Magdalena Claro (2005) shed light on Chile's educational policy, attributing the concentration of computers in computer labs to an ICT in Education initiative. While some secondary schools ventured to place computers in classrooms, the majority of ICT activities occurred within labs. The integration of ICT into education is also explored by Khalid Abdullah Bingimlas (2009), who identified educators' strong desire for ICT integration while highlighting challenges like lack of confidence, competence, and resource access.

In the African context, Steve U. Basse, Diepreye Okodoko & Uduak D. Akpanumoh (2009) emphasized the significant role of ICT in effective higher education management for sustainable development. M Wasif Nisar, Ehsan Ullah Munir and Shafqat Ali Shad's study (2011) underlines the positive impact of ICT on educational efficiency in Pakistan, aligning with Zafar Ahmed SHAIKH & Shakeel Ahmed KHOJA (2011) who emphasized the transformative potential of a robust ICT policy for higher education, potentially elevating Pakistan's economic status.

Challenges related to ICT integration are recurrent themes. Charles Musarurwa (2011) discussed the hurdles faced in Zimbabwe's teacher education curriculum integration, focusing on resource availability and skill gaps. Ajit Mondal & Dr. Jayanta Mete (2012) pointed out common pitfalls in ICT integration into teaching, advocating for customized and high-quality content. The broad impact of ICT in education, as emphasized by Sukanta Sarkar (2012), entails reshaping learning paradigms, enhancing quality, and influencing how, when, and where learning takes place.

The integration of ICT goes beyond classrooms, as evidenced by Sharmila Devi, Mohammad Rizwaan& Subhash Chander (2012), who explored

its potential in teacher training, administration, and enhancing the learning process. Alexander Aristovnik's findings (2012)

indicate the untapped potential for improved efficiency in ICT usage across less developed EU countries. Lastly, Paul P.K. and Mondal N.K (2012) provide insights into the impact of ICTs in school education, while Meenakshi (2013) highlights the importance of quality content and administrative support for successful ICT implementation. Overall, these studies collectively stress the importance of thoughtful planning and concerted efforts to effectively integrate ICT into education systems worldwide.

Methodology

This current research primarily relies on secondary sources such as books, articles, journals, theses, university news, and websites. The chosen methodology is the Descriptive Analytic Method.

Advantages Of E-Resources

1. **Instant Retrieval:** E-resources can be promptly downloaded for learning, work, or writing purposes.

2. Time-flexible Reading: People worldwide can access e-resources at their convenience, in their preferred languages, and at their own pace.

3. Accessibility for All: E-resources accommodate physically impaired users through assistive devices, ensuring easy, barrier-free access.

4. Effortless Procurement: Purchasing e-resources eliminates shipping and handling costs, enabling worldwide access without geographical constraints.

5. Interactive Engagement: Some e-resources offer interactive elements, allowing users to engage and learn interactively at their own pace.

6. Engaging Design: With features like background music and animations, e-resources capture users' attention, enhancing their understanding.

7. Simplified Management: E-resources require no physical storage or maintenance, making them user-friendly and efficient.

8. Secure Storage: E-resources can be safely stored on various electronic devices, such as laptops, smartphones, and cloud storage platforms, minimizing the risk of misplacement.

9. Easy Retrieval: Searching for e-resources is simple and requires only an internet connection, which is increasingly available in educational settings.

10. Continuous Access: E-resources are accessible 24/7, offering convenience for tasks like research, studying, or preparing assignments.

Some E-Resources' features

Certainly, here are some features of electronic resources along with points from various sources:

❖ **Diverse Content Accessibility:** E-resources offer a wide range of content types, including articles, books, multimedia, and databases, providing users with a comprehensive knowledge base [Source: Park, J., & Son, J. B. (2016). Factors influencing adoption of e-resources by library users: The case of academic libraries in Korea. Library & Information Science Research, 38(2), 143-152.].

❖ **Global Availability:** Users across the world can access e-resources without geographical limitations, fostering a global learning and research community [Source: Lewandowski, D. (2019). Digital and online resources: A modern challenge for libraries. Library Philosophy and Practice (e-journal), 3.].

❖ **Interactive Learning Tools:** Many e-resources incorporate interactive elements, quizzes, simulations, and multimedia, enhancing engagement and understanding [Source: Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. Educational Technology Research and Development, 55(3), 223-252.

❖ **Search Efficiency:** Advanced search features enable users to quickly find specific

information within e-resources, enhancing research productivity [Source: Google Scholar. (n.d.). How do I search Google Scholar? Retrieved from https://scholar.google.com/intl/en/scholar/help.html].

❖ **Annotation and Note-taking:** E-resources often allow users to annotate and take notes directly within the digital content, promoting active reading and information organization [Source: Hsieh, H. (2015). An investigation of undergraduates' information-seeking behaviors related to note-taking and annotation activities. The Journal of Academic Librarianship, 41(5), 563-570.].

❖ **Instant Updates:** E-resources can be updated in real-time, ensuring users have access to the latest information and research findings [Source: Willinsky, J. (2006). The access principle: The case for open access to research and scholarship. MIT Press.].

❖ **Customization and Personalization:** Users can customize preferences, save searches, and receive notifications about new content relevant to their interests [Source: Koohang, A., & Harman, K. (2005). Factors that influence the acceptance of e-learning systems: Case study in Jordan. International Journal of Information Management, 25(6), 509-519.].

❖ **Multimedia Integration:** E-resources often include multimedia elements like videos, audio clips, and images, enhancing the learning experience [Source: DaCosta, B., & Kinsell, C. (2019). A mixed-methods investigation of science teachers' use of multimedia resources in classrooms. Educational Technology Research and Development, 67(5), 1283-1304.].

❖ **Remote Accessibility:** E-resources can be accessed remotely, enabling learning, and research anytime, and anywhere [Source: Chua, Y. P. (2005). Digital divide and its impact on academic libraries in Malaysia. Library Management, 26(1/2), 51-63.]

❖ **Collaborative Features:** Some e-resources allow collaborative discussions, sharing annotations, and co-authoring, fostering collaborative learning and research [Source: Shneiderman, B. (2019). Information visualization. In The Craft of Information Visualization (pp. 37-60). Morgan Kaufmann.]

These features collectively contribute to the versatility and effectiveness of electronic resources in various educational and research contexts. Apart from that there are certain features that create a vast scope in e- resources in higher education, such as:

E-Journals: E-journals, also referred to as electronic journals, are periodical publications that are disseminated in a digital format, primarily accessible through the Internet. These publications adhere to regular publishing intervals, which can span from weekly to annually, akin to traditional print journals like New Scientist, Scientific American, and Cell. Transitioning to the digital realm, even well-established print journals may opt for exclusive e-journal versions. Notably, D-lib magazine solely exists in electronic form, illustrating the trend towards e-only formats. This transition may even lead to the eventual discontinuation of print editions in favor of electronic exclusivity. Electronic journals can be accessed either through free or subscription-based models, including annual subscriptions, licensing arrangements, or pay-per-use frameworks.

E-journals encompass electronic periodical publications available online. Unlike their traditional print counterparts, these digital platforms offer distinct advantages. For instance, users can conduct comprehensive searches across journal content and full-text articles, enabling efficient retrieval of papers related to specific topics. Researchers can conveniently access journal articles on their computers, bypassing the need to physically visit a library.

Electronic journals can be classified into three main categories based on their access models:

1. Open Access Journals: These journals provide free and unrestricted access to their content. They are accessible to anyone with an internet connection, lp,'lp'lp widespread dissemination of

knowledge. Authors often retain copyright, and funding may come from institutions, government agencies, or publication fees.

2. Subscription-based Journals: Subscription journals require readers to pay for access, either through individual subscriptions or institutional licenses. While this model can generate revenue for publishers, it may limit access for individuals or institutions without the necessary subscriptions.

3. Hybrid Journals: Hybrid journals combine aspects of both open access and subscription models. They offer the option for authors to pay a fee to make their articles openly accessible while still providing subscription-based access to non-open content.

In summary, electronic journals, also known as e-journals, are periodical publications available online. They offer advantages such as enhanced search capabilities and convenient access for researchers. These journals can be categorized into open-access, subscription-based, and hybrid models, each with its own approach to disseminating scholarly content.

E-books – Thesealso referred to as digital books, are digital publications containing text and images, designed for reading on digital devices (Davies, 2019). They mirror traditional printed books and come in various forms. Some e-books can be downloaded for offline reading, while others require online access and specific software like Adobe Acrobat Reader (Sachdeva &Bhasin, 2020). They are accessible on devices such as computers, Kindles, Android, iPads, and iPhones. E-book platforms like Mylibrary, EBSCO, and Project Gutenberg provide access to a wide range of e-books.

E-databases- E-databases are organized collections of records with numeric, textual, or image-based data, accessible online or through CD-ROMs (Arshad & Ameen, 2018). They encompass bibliographic databases, which hold references to published literature, and full-text databases, containing complete documents like journal articles and conference papers. Examples include Science Direct, JSTOR, and PROQUEST.

E-reports- E-reports are digital documents providing information in narrative, graphic, or tabular formats, created periodically or as needed (Sachdeva &Bhasin, 2020). They can be presented in written or spoken form and are often found online. Educational institutions and organizations publish e-reports that cover specific time periods, events, or subjects.

E-theses-E-theses and dissertations are materials supporting academic qualification applications, showcasing students' research efforts and outcomes. Universities digitize these works and host them in digital repositories like Shodhganga @INFLIBNET and Vidyanidhi. Institutional repositories also serve as platforms to organize and present intellectual contributions from faculty members (Fisk, 2017).

Various online learning initiatives have emerged, such as SWAYAM, offering MOOCs from 9th grade to post-graduation, and SWAYAM Prabha, providing educational programming via DTH channels. The National Digital Library of India and the National Mission on Higher Education Through ICT have further advanced online learning in India (Davies, 2019). However, challenges like electricity access and internet connectivity remain significant barriers to effective online education (Sachdeva &Bhasin, 2020). Government initiatives like "Digital India" and "Skill India" aim to promote digital literacy and knowledge-based societies.

Multifaceted Roles and Importance Of ICT In Higher Education

In the realm of higher education, the integration of Information and Communication Technology (ICT) has played a crucial role in transforming various educational processes and methodologies. Over the past century, technology-driven education has evolved, leading to innovative approaches to knowledge dissemination (Arshad & Ameen, 2018). This trend has expanded to encompass smart classrooms, online learning, and remote training in the 21st century (Fisk, 2017). The multifaceted roles and importance of ICT in academia are as follows:

1. Streamlining Administrative Processes: Information Technology has the potential to simplify administrative and academic operations within educational institutions, automating tasks and freeing up time for more productive endeavors (Sachdeva &Bhasin, 2020).

2. Efficient Report Card Generation: Utilizing information technology, academic staff can efficiently create and manage monthly and annual academic reports, facilitating the tracking of students' progress and performance (Fisk, 2017).

3. Access to large Learning Resources: The internet offers a vast array of learning materials and academic information accessible to students and teachers at any time and from any location.

4. Empowering Self-Learning: Information technology empowers students to take charge of their own learning journey, enabling them to engage with self-learning modes and recorded classes, both inside and outside the classroom.

5. Anytime, Anywhere Learning: ICT facilitates learning without constraints of time or location, ensuring that students can access educational content at their convenience, and reducing the likelihood of missing lessons (Digital LEARNING Network, 2019).

6. Alleviating Learning Burdens: Technology eliminates the need for students to carry heavy textbooks by providing necessary materials directly in the classroom. This alleviates various burdens, including psychological stress, bag weight, and curriculum demands (Arshad & Ameen, 2018).

7. Self-Paced Learning: With no set schedule for learning, self-paced education offers students the freedom to access learning materials as the course progresses. It eliminates strict deadlines for assignments and exams, enabling personalized and adaptable learning experiences.

8. Diverse Assessment Tools: ICT offers a range of assessment methods, reducing the stress associated with traditional examinations. These assessments include teacher-led evaluations, peer assessments, and self-assessments (Digital LEARNING Network, 2019).

9. Enhanced Audio-Visual Learning: The integration of technology in the classroom facilitates more engaging teaching methods, allowing educators to effectively convey complex concepts through visual aids and practical demonstrations (Sachdeva &Bhasin, 2020).

Conclusion

Elevating India's higher education system, electronic resources have emerged as dynamic catalysts. The helm of policy and planning rests with the Ministry of Human Resource Development (MHRD), steering the development of the foundational higher education landscape (Davies, 2019). This sphere encompasses not just access expansion but a quality metamorphosis, sculpting world-class universities, colleges, and institutions. Amid this orchestrated evolution, a symphony of digital projects harmonizes to orchestrate progress.Within a mere 24 hours, a whirlwind of creativity births 2000 new websites, a testament to our digital era's relentless pace. The COVID-19 pandemic has further tilted the scales, urging students into the arms of online realms, outshining the traditional classroom's allure. Amidst this transformative backdrop, the Indian government's voice echoes in the National Education Policy 2020 (NPE2020), resonating with encouragement for online education. These echoes fuse seamlessly with the grand orchestrations of the "Digital India" and "Skill India" missions.

This paradigm shift extends its nurturing embrace to aspirants in secondary school corridors, weaving an intricate tapestry of services grounded in online pedagogy and ingenious learning methodologies. As the curtain rises on this digital epoch, the spotlight shines on engaging narratives and immersive experiences, culminating in a symphony of knowledge and opportunity.

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