

Disruptive Technology in Higher Education, with a Focus on Library and Information Science

Dr. Chandramani Kailash Gajbhiye

Librarian

Manoharbai Patel College of Arts, Commerce and Science Deori,

Amgaon Road, Deori -441901, Dist. Gondia (India)

Email. gchandra075@gmail.com, Mob. 7038891126

Abstract:

The role of "disruptive" modern technology in higher education is examined in this research, with a focus on Library and Information Science. Higher Education Institutions (HEIs) have invested substantial sums in learning technologies in this country and abroad, with Virtual Learning Environments (VLEs) being more or less universal, but these technologies have not been uniformly adopted and utilized by students and faculty. Instead, other technologies are frequently employed to enhance learning and teaching that are not owned or controlled by HEIs.

This study examines data on the impact of disruptive technology using Activity Theory and Expansive Learning. The information was on technology awareness and use.

Learners employ a limited set of technologies to support their learning, but they have a proclivity to use resources other than those provided by their HEIs, according to observation.

This research uncovers a discrepancy between learning technology made available by higher education institutions and those used in practice. Students and lecturers rely on their higher education institutions to help them learn and teach. Outside of HEIs, the use of technology has ramifications for learning and teaching monitoring, as well as the role of HEIs, which are no longer the gatekeepers to knowledge. Confronting reality; issue solving; VLEs; online learning; informal learning; disruptive innovation; disruptive technology; activity theory; expanded learning; disruptive innovation; disruptive technology.

Keywords: confronting reality; problem solving; VLEs; online learning; informal learning; disruptive innovation; disruptive technology; activity theory; expansive learning.

Introduction:

These disruptive technologies, according to Christensen's theory of Disruptive Innovation, are not specifically designed to enhance learning and teaching in higher education, but they do have educational potential. A disruptive technology is either a ground-breaking product that generates a completely new industry or one that displaces an established technology and shakes up the industry. Clayton M. Christensen, a Harvard Business School professor, developed the term disruptive technology. Christensen divides new technology into two groups in his best-selling book "The Innovator's Dilemma," published in 1997. Technology that is sustainable is based on incremental enhancements to an existing technology⁽¹⁾. Because disruptive technology is new, it frequently has performance issues, appeals to a

small audience, and may not yet have a demonstrated practical application. (Alexander Graham was one example of this.)

A few instances of disruptive technology are as follows:

- a. The personal computer (PC) replaced the typewriter, forever altering how we work and communicate.
- b. The Windows operating system's combination of low cost and a user-friendly interface was critical to the personal computing industry's rapid growth in the 1990s. Personal computers wreaked havoc on the television industry, as well as a slew of other industries.
- c. Email revolutionised how we communicated, largely replacing letter-writing and causing major disruptions in the postal and greeting card businesses.
- d. Cell phones allowed customers to call us from anywhere, disrupting the telecom industry.
- e. The laptop computer and mobile computing enabled workers to connect to corporate networks and collaborate from anywhere, allowing for a mobile workforce. In many organizations, laptops replaced desktops.
- f. Smartphone's essentially supplanted cell phones and PDAs, disrupting: pocket cameras, MP3 players, calculators, and GPS devices, among many more possibilities, thanks to the accessible apps. Smartphone's are frequently used to replace laptops by some mobile users. Others would rather use a tablet.
- g. Cloud computing has been a big disruption in the business world, replacing many resources that were formerly housed in-house or given as a traditional hosted service.
- h. Social networking has had a significant impact on how we interact, disrupting phone, email, instant messaging, and event planning, particularly for personal use.

Large organizations, according to Christensen's book, are intended to function with sustaining technology. They thrive at knowing their market, remaining connected to their clients, and developing existing technologies. Low-margin disruptive technologies, on the other hand, make it difficult for them to capitalize on possible efficiency, cost reductions, or new marketing opportunities⁽²⁾. Christensen illustrates his point with real-world examples, showing how it is common for a large corporation to dismiss the value of a disruptive technology because it does not align with current company goals, only to be blindsided as the technology matures, gains a larger audience and market share, and poses a threat to the status quo.

New Technology in Library and Information Science

Given that the major aim of libraries is to provide everyone with equitable access to information, why not be a digital trailblazer and adopt more innovative technologies? "It is the library's job to be at the cutting edge of diverse uses of culture and uses of technology," says Mogens Vewtergaard, Manager of Library and Citizen Service at Roskilde Libraries in Denmark, in our interview.

This article discusses a variety of modern library technologies that are both relevant and beneficial. We concentrate on the technology's applicability and potential library benefits. Do you want to know what the latest library technology trends are? John Garland assists with anything from digital storytelling to virtual reality to kinetic bikes and RFID technologies. John Garland joins us in examining how libraries are using technology to improve customer service today⁽³⁾.

1. **Big Data:**

People's most fundamental behaviours are creating more data than ever before, thanks to technology breakthroughs. Librarians have the necessary skills and experience to make the best use of these massive sources of information, so storing and analysing large databases can be a real benefit. How can libraries make use of big data? Big data can help libraries improve their overall activity by giving them more insight into their patrons' minds. In addition, libraries can leverage big data to provide a personalised user experience by providing information and resources tailored to each user's specific needs. However, libraries must also address the privacy concerns that come with any access to personal data.

2. **Artificial Intelligence:**

Artificial intelligence is no longer a sci-fi concept, as it is increasingly incorporated into our daily lives. Adding an intelligent side to all library applications is a great way to learn about user behaviour patterns and adjust to their needs.

3. **Block chain technology:**

As Bitcoin's power has grown, block chain technology has become one of the most talked technologies in the past year. Block chain technology is a decentralized database that records pseudo-dynamited digital transactions and makes them visible to anyone on the network. As a result, it is a novel method of collecting and storing data.

4. **Internet of Things (IOT):**

As having access to the internet has become more of a necessity than a luxury, the internet of Things (IOT) is gaining traction. RFID (Radio Frequency Identification) technology is an example of this. The Internet of Things (IoT) refers to the ability to connect ordinary items and communicate data between them. The data is only transferred through the Internet in the case of IOT. There are numerous library applications available, ranging from monitoring humidity levels for unique collections to tracking room utilization and programme attendance. As a result, by expanding its services and materials, the library can provide a better user experience.

5. **Bookmarking apps for libraries:**

The technology is still in the concept stage, but it has the ability to provide users instructions to a book they're looking for or to keep track of their lending activities in a more dynamic way. Many people still have trouble finding books in the library, therefore a feature that can direct them to the book is a cutting-edge solution to the problem.

6. **User-centered interfaces and applications:**

A tailored interaction between the system and the user is one of the future perspectives of library services. Libraries can use technology to create a digital

experience for the user, whether it's an interactive game projected onto the floor for children to interact with, digital exhibitions featured on screens, bit screens in libraries that can be used to offer different kinds of information and also inspire users to find certain books, or a simple display that allows taking a 'selfie.'

7. **Augmented reality:**

Augmented reality is a trendy topic in the IT world, and people are interested in seeing how it is used in a variety of fields, from medicine to gaming. So why not use it in libraries to blend digital and real-world experiences? Their augmented reality digital Mythical Maze app has been utilised in summer reading challenges around the UK to assist children improve their reading skills during the summer. librARi, an image-based augmented reality application, is another interesting technology highlighted by Piotr in his blog article.

8. **Digital interfaces for printed books:**

Combining the real and the digital is a trend that we are all eagerly anticipating, particularly when it comes to physical goods. Everyone enjoys using an e-'copy' book's and 'find' functions, as well as the practice of highlighting all relevant passages from papers.

9. **Self-Driving Automobiles:**

Self-driving cars appear to be a re-enactment of sci-fi movies that we have all seen as children. However, cars that can travel between destinations without a human driver, according to Ida Joiner, author of the recently published book "Emerging Library Technology," could be very important for libraries in the future. Librarians will play a critical role in offering resources to users interested in learning more about autonomous vehicles and pursuing jobs in this field. Libraries can engage with schools, businesses, and workforce agencies to promote this technology and provide users with a variety of options, such as internships, mentorship opportunities for kids, career fairs, and seminars to learn about the technology.

10. **Drones:**

Drones are miniature, remotely controlled flying devices that are a current science trend. Libraries can benefit greatly from the use of drones, whether by introducing a new technology to the library or by hosting workshops to teach users how to build and fly a drone. Massive technological advancements are ongoing and on the horizon, which can enhance the user experience at the local library.

Innovative Services That Aren't Disruptive

Not all innovations are game-changers. Take, for example, search engines on the internet and library databases. Personalized services, according to Choudhury (2002), are the same as reference services, and reference services are not always offered by human agents or librarians. Though librarians still give references in the manner described by Ranganathan (1961), the services have evolved to include services that are not provided by human agents. Even in the digital library setting, Chowdhury (2002) finds that providing a reference or customized service is crucial, with or without librarians in between. The introduction of non-librarian reference services did not disrupt the reference service; rather, it supplemented the services that had been in place since the beginning of libraries. Bawden (2005) conducted a

comparison study of Google, the internet search engine, and a few library databases. The finds from library systems are determined to be superior to the hits from Google in terms of results. The skills of the searchers appear to be lacking in the library databases. If searchers' abilities increase, library databases are likely to produce better results, whereas Google results will remain the same whether or not searchers' skills improve⁽⁴⁾. Not all advances are disruptive, according to these studies. The fact that search engines have been integrated into library databases means that certain new services complement existing ones.

Users to Non-Users

In addition to users, libraries have non-users and shy users, according to Casey and Savastinuk (2006). (or potential users). Traditional libraries continue to devote all of their resources and infrastructure to supporting their existing users. Non-users and potential users are left out of the process. Services catering to non-users or potential-users have the potential to disrupt incumbent services. There is a good chance that existing services will be disrupted unless non-users and potential users are converted into consumers, regardless of how sophisticated the technology are.

Disruptive services cater to markets or users who aren't served by traditional services. Seeking for new users is the same as looking for a new market for the library. Libraries are unlikely to be disrupted as long as current and future generations of library users continue to use them. Keeping up with the changing nature of how new generations look for authoritative knowledge, whether current or archive, was a non-negotiable word that librarians had to adopt and put into practice in order to keep the library and librarians running smoothly.

Conclusions:

Existing services perform better with the help of sustaining technology. In the same way, sustaining technologies will improve library services for current customers, but even the most radical sustaining technology will not guarantee non-disruption. Disruptive technologies, on the other side, will develop to replace established services. For the sake of the other, one of these two types of technologies could not be abandoned. Libraries require sustaining technologies to service their current clientele. However, libraries must adapt to disruptive technologies if they are to remain unaffected. In India, the bulk of libraries are still trying to integrate sustainable technologies. Known roadblocks, such as funds, infrastructure, and human resources, are reported in various formats. One such stumbling block is people's attitudes toward adopting information technology, which Temjen investigated (2003). Anxiety, efficiency, performance, confidence, and acceptance have all been linked to technological adoption. Among these factors, information technology is the one that causes the most anxiety. Anxiety is a mental condition that arises from a sense of inadequacy or unfamiliarity. If these findings are generalized, Indian library professionals are doomed to fail due to their incapacity to accept sustaining technology and foresee disruptive technologies. Despite the fact that the entire discussion is predicated on the assumption of disruptive innovation's applicability, it should be noted that the library, as a service-oriented non-profit organization, is not immune to disruption. It is vital to investigate whether Christensen's (1997) disruptive innovation theoretical paradigm is genuinely applicable to library services.

References:

1. https://journal.alt.ac.uk/index.php/rlt/article/view/1352/pdf_1
2. <https://whatis.techtarget.com/definition/disruptive-technology>
3. <https://ir.inflibnet.ac.in/bitstream/1944/2031/1/27.pdf>
4. <https://princh.com/blog-8-technologies-to-implement-at-the-library-of-the-future/#.YfjFo9R95kg>