DLINE JOURNALS

International Journal of Information Studies

Print ISSN: 1911 8408
Online ISSN: 1911 8414

IJIS 2024; 16 (4)
https://doi.org/10.6025/ijis/2024/16/4/119-125

Exploring Emerging Educational Technologies in School Libraries: A Research Review

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Received: 28 June 2024
Revised: 2 August 2024
Accepted: 9 August 2024

ABSTRACT

This research informs about how emerging educational technology can serve in school libraries, how virtual reality, augmented reality, maker space artificial intelligence, and gamification technologies will impact school libraries, and what the impact will be on their use. Their impact on the school library. And what the effect will be.

These technologies promote self-study, creativity, and integration among students. They provide information about their use and address the challenges of access inequalities and digital literacy gaps. This explains why librarians, academics, and teachers collaborate to use them. Evidence-based practice requires continuous value analysis and research. School libraries have contributed to preparing students for the digital world by using emerging technologies to meet the challenges. School libraries strive to create a good learning environment.

Keywords: Virtual reality, Augmented reality, gamification, Artificial intelligence, Educational technology, school library, Emerging technology, Maker space, Digital Literacy, Educational games

1. Introduction

Nowadays, school libraries are not just repositories of books but have become centres of interest by incorporating modern educational technologies and facilitating learning. The entire world's education system has been transformed by the digital revolution. This research paper examines integrated school libraries, their impact on learning outcomes and the challenges and opportunities they present. This research informs about how these technologies affect school libraries and how a librarian can present his school library to his readers through these technologies by creating interest among students. "The paper considered emerging intelligent technologies for smart school libraries: a meticulous compendium. Emerging intelligent technologies are innovations in technologies, software, or applications that enable librarians to adequately prepare and present information content in an enticing way to users or learners, resulting in effective information service delivery. It pictured a smart school library as a smart center in the school library that makes learning and other educational activities interactive. Speed reading software, Plotagon, and mathematics problem-solving software were identified as emerging intelligent technologies that can be used for smart school libraries."

1.1. Emerging technologies and trends

Implementing well-established technology for library instruction has been the subject of extensive research. Nevertheless, choosing new instructional technology for libraries is the subject of little study. It can be challenging to define the term "emerging technologies" itself. Though library professionals often concentrate on information technology and education-related issues, a broader definition of emerging technologies encompasses revolutionary and transformative advancements expected to impact fields as diverse as stem cell research, biotechnology, and nanotechnology (Einsiedel, 2009).

Emerging technologies, inventions, and developments are continuing to meet user needs. According to Einsiedel (2009), emergent technologies are seen as forward-looking because they will inevitably deliver strategic benefit, frequently in aspirational ways.

Another standard prediction is that these technologies will revolutionize or completely change schooling. The New Media Consortium's annual Horizon Report is a well-liked resource for information on educational trends. It highlights important new technologies that will impact higher education in five years. According to Johnson et al. (2014a), tablet computing, wearable technologies, gaming, and gamification are among the growing technology trends influencing teaching and learning. Scholars, practitioners, and educators need to be open to considering whether or not our libraries and institutions should support these popular technologies. Anyone utilising educational tools should give this serious thought.

2. Emerging Educational Technologies in School Libraries

2.1. Speed Reading Software

This software aims to help students improve their reading habits, enhancing their understanding in various areas beyond academics. Reading accelerates cognitive development, breeds knowledge, and fosters success by allowing students to exchange ideas with more advanced minds. It improves vocabulary, memory, and creativity and fosters national educational growth. Speed-reading software teaches students to read quickly and improve reading comprehension, often including exercises, quizzes, and eye-strengthening training. Examples include Spreeder, The Lris Reading Program, eyeQ speed reading software, ReadSpeeder Software, Zap Reader Software, Spritz eReader.

2.2. The Plotagon Software

Plotagon is a three-dimensional information content creator that allows librarians to create valuable educational content for students. It provides essential information in digital and smart formats, such as presenting the history or culture of a specific group in a smart library setting. This helps explain complex situations and reduces stress during learning. Plotagon offers pre-made templates for various information content, allowing librarians to work as directors and designers, setting up settings according to their content. Its simplicity makes it easy to use.

2.3. Mathematics Problem Solving Software

This is an interesting and educational app that educates and enhances young students' problem-solving skills in mathematics. They are intended to help young students anxious about math learn it more easily. School librarians developed software that presents mathematical problems in comprehensible form using realia and pictures. It aids in number subtraction, addition, multiplication, and division. Options include Mathguru, Crocodile Mathematics, Maths Solver, and *iMathematics*. These tools minimise tension and apprehension, enhancing learners' ability to manipulate numbers. They are also user-friendly mathematical modelling tools.

2.4. Spelling Software

It teaches students how to spell words and improves their spelling ability. Spell checkers are used in spelling software to help users improve adequate spelling abilities by correcting misspelt words. Using the spell check tool is a good way to guarantee that young students have high-quality spelling skills. Spelling software teaches beginners about word pronunciation and meaning. Spelling software examples include School Zone Spelling, Spell Blaster, and Spell Track.

2.5. The Collaborative Board

School librarians can utilize collaborative boards to interactively display and disseminate material to a specific set of users/learners. The collaboperative board has amazing advantages for library instruction. The collaborative board in a smart library allows school librarians to create, organize, save, and modify lesson content, as well as draw, colour, raise, and reduce objects, making learning more enjoyable and fostering collaboration between teachers and students, similar to a large computer tablet.

2.6. Virtual Reality (VR) and Reality (AR)

Virtual reality creates unity among students and helps them learn the subject more interactively. These apps include virtual field trips, engaging historical re-enactments, and interactive science simulations. These technologies provide students with certainty and experiential learning opportunities The students' understanding of these things has a profound effect on the mind. AR Wave Students use AR glasses, apps, and software overlays to transform digital information into real-life experiences. VR is also a technology that allows various experiments to be done by computer, providing a situation that is very similar to the real environment, which changes like the movement of the fingers.

2.7. Maker Space

It is a place where students and teachers can come together in a school or library to create, invent, design, prototype, analyze, build, craft, or draft. Students can do this alone or in a group. Various high- and low-tech tools and materials can be used for this.

- These maker spaces in school libraries give students the experience of writing, creating, analyzing and solving problems
- Three printers are ready with robotics, kits and electronics components. Maker spaces encourage innovation and creativity
- A maker space allows students to learn together by encouraging collaboration and developing 21st-century skills such as critical thinking and communication.

3. Artificial Intelligence

It is a technology that simulates human intelligence with machines, mainly used in computers. AI-powered educational tools are being leveraged to provide personalised learning experiences, adaptive assessments, and intelligent tutoring systems in school libraries. These technologies assist educators in tailoring instruction to individual student needs.

- Artificial intelligence and educational tools enhance learning by adapting to students' needs and preferences.
- Properly intelligent teaching systems provide appropriate feedback and guidance. Enhance students' comprehension and mastery.

• Artificial intelligence algorithms analyse student program data to identify improvement areas and make recommendations for personalised learning.

4. Gamification

Gamification is a technology that teaches the hard aspects of learning through games. It stores data in the cloud and uses it when needed. Methods to use sight, hearing, and touch skills are advantageous for children.

• Educational games make learning fun and bring fun to them.

• Makes active student participation.

• Gamified learning environment makes students learn the achievements to trace their progress in reaching their goals. Impact on learning outcomes: the application of emerging educational technologies in school libraries has positively impacted learning and achievement.

• Improved usage. The deeper knowledge and understanding. Increased retention is the result of the usage of this technology

• Personalised learning experiences for students, consider divergent learning styles and abilities.

• Better academic performance and self-satisfaction of students. Challenges and opportunities: though there are many main challenges to its accomplishment, some of the opportunities are given below

• Though it has many advantages, adopting emerging educational technologies has faced challenges like regional disparities, infrastructure limitations, and literacy gaps.

• Sufficient training and professional development should be provided for teachers to integrate technology into teaching and learning practices.

• Collaboration between librarians, academics, technologists, and other stakeholders is determined to utilize emerging technologies to their fullest potential.

• Continued evaluative research is essential to judge the effectiveness of these technologies and guide evidence-based practice.

5. Internet of Things and RFID

IoT technology uses information-collecting and identification technologies to connect things and communication networks. IoT technology links items and people in virtual-related technologies, primarily used in libraries, to upload real-time book status to the library administration information system using RFID electronic tags. RFID self-checkout services and book location services are examples of IoT-supported services. These systems include an embedded electronic tag, a reader, and an information management system. The tag contains basic information about the book, which the reader uploads to the system for patrons' borrowing and returning operations.

6. Digital Learning Platforms

School libraries are increasingly integrating digital learning platforms that offer communicative and individual learning experiences. Digital learning platforms often include characteristics like virtual classrooms, multimedia resources, and adaptive learning technologies. With this platform, students can learn confidence while speaking, improve their imagination power, and experience learning with joy and fun. Ex: *kidlit tv*, Khan Academy Kids, Write the world, Pixton.

6.1. Digital Resources and E-books

With the shift towards digital learning, school libraries are expanding their collections to

include digital resources such as e-books, online databases, and educational apps. These resources provide students with access to information and learning materials anytime, anywhere.

6.2. Data Analytics and Learning Analytics

Educators use data analytics and learning analytics tools to track student progress, identify learning gaps, and personalise instruction in school libraries. These insights help optimise teaching strategies and support student achievement.

6.3. Digital Citizenship and Online Safety

As students engage more with digital technologies, school libraries play a crucial role in teaching digital citizenship skills and promoting online safety practices among students.

6.4. Voice Control

A new generation of wireless toys utilizes technology trends like the Internet of Things, artificial intelligence, and machine learning to create personalized interactions between items and children. These toys challenge traditional teaching methods by allowing children to interact with experts, helping them achieve their digital educational goals.

6.5. Unplugged

Unplugged technology provides constant access to vast amounts of information, making modern libraries use it in calm settings to promote concentration and focus. These spaces, often called "unplug zones" or "digital escape spaces," can benefit professional and personal experiences, especially for reflective work duties.

6.6. Robots

Initially introduced in industrial settings, robots have since expanded to work, education, research, and home environments. Libraries like the Joe and Rika Mansueto Library in Chicago and Connecticut's Westport Library have successfully employed robots. These institutions can assist displaced workers in acquiring new skills and improving existing ones, enabling them to transition to new jobs in environments where robots significantly impact workflow.

Exploring these emerging educational technologies in school libraries can provide valuable insights into how libraries evolve as dynamic learning spaces supporting 21st-century skills and academic goals.

7. Implementing emerging intelligent technologies in school libraries is facing opposition due to various issues

Several factors influence the usage of new intelligent technology in school libraries, including...

7.1. Absence of Technological Literacy

Technical literacy involves using appropriate tools effectively to solve problems and manage information, but many school librarians lack the necessary technical know-how.

7.2. Poor Attitude of Library Personnel

Library personnel's success is largely determined by their attitude towards modern technologies. Technophobia among librarians limits motivation to use intelligent technology effectively, leading to manual service rendering and potential interference with users'/learners' time. This concerning attitude towards new technologies is affecting library operations.

7.3. Poor Funding

The cost of purchasing and installing modern technology in school libraries is prohibitively high, hindering the adoption of intelligent tools. Funding is crucial for the smooth operation of institutions, and school libraries often lack the necessary funds to acquire this modern equipment.

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7.4. Power Outage

This is due to a temporary disruption of power, particularly the electric supply. School libraries face challenges in implementing sophisticated technologies in Nigeria due to an inadequate

power supply. To function correctly, intellectual libraries' facilities require electronic supplies. The lack of Fluctuation in power supply presents a significant impediment to the usage of these technologies.

Knowing that school libraries are facing various problems in achieving infrastructural libraries impacts students' educational achievements.

8. Recommendations and Conclusion

The codification of Emerging Educational Technologies in school libraries has immense potential to change teaching and learning. Such as Speed Reading, The Plotagon, Maths Problem Solving, Spelling Software, Virtual Reality, Augmented Reality, MakerSpace, Artificial Intelligence and Gamification Control Academics Engagement Creativity Delivers Personalized Learning Experiences.

To enhance students' digital skills, educators can participate in professional development opportunities and collaborate with industry partners to stay updated with the latest digital tools and platforms, thereby overcoming challenges in building relevant and updated digital literacy curricula. However, it is crucial to challenge digital literacy as an access infrastructure to ensure that all students get equal opportunities. Through collaboration through continued research, school libraries can unlock the potential of emerging technologies to empower learners and prepare them for success in the digital age.

Digital literacy is an essential skill for students in the current digital age. Educators can enhance students' digital learning skills by incorporating digital media into classroom lessons, teaching online safety, and encouraging exploration, collaboration, critical thinking, problem-solving, and productivity tools, thus preparing them for future success.

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