iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

ASSESS THE AVAILABILITY OF DIGITAL TECHNOLOGY IN EDUCATION

Mohit Yadav,
Research Scholar, C.C.S University, Meerut
Dr. Himanshu Agarwal,
Professor, Faculty of Commerce, D.N. (PG) College, Meerut

ABSTRACT
Today, digital technology continues to evolve and advance rapidly. The development of new technologies such as artificial intelligence, machine learning, and blockchain is expected to drive further innovation and create new opportunities for businesses, education and individuals alike**.** As the digital education landscape continues to evolve, it is likely that we will see further advancements in the role that digital technology plays in transforming education in India and around the world. In the present research study the following components have been included to analyze the availability of digital technology in education: digital technology usage in classrooms, effectiveness of digital technology in improving learning experience, ease of access to digital technology, impact of digital technology on education quality, challenges to digital technology implementation.

Keywords:
Digital Technology, Education, Effectiveness, learning experience, ease of access, education quality

INTRODUCTION

Digital technology has a significant impact ever on education in India, transforming the way students learn and interact with educational content. The emergence of digital education has brought about a range of benefits for students, including increased access to quality education, improved learning outcomes, and greater flexibility in terms of time and location. One of the key contributions of digital technology in digital education in India has been the development of online learning platforms. These platforms provide students with access to a range of educational content, including lectures, videos, and other materials, which they can access from anywhere at any time. This has made education more accessible to students in remote areas or those who cannot afford to travel to attend classes. Another important contribution of digital technology in digital education in India has been the development of virtual learning environments (VLEs). VLEs enable students to engage with educational content in a more interactive and immersive way, allowing them to explore concepts and ideas in greater depth. VLEs also provide teachers with a range of tools and resources that they can use to create engaging and interactive learning experiences for their students**.**

Digital technology has also played a significant role in facilitating collaborative learning in digital education in India**.** Online platforms and VLEs provide students with opportunities to collaborate and work together on projects, enabling them to learn from each other and develop important teamwork skills. This has been particularly beneficial for students who may not have access to traditional face-to-face learning environments.

Digital technology in education in India has made a notable impact through the incorporation of artificial intelligence (AI) and machine learning (ML) to tailor learning experiences for students. Algorithms in AI and ML can assess student data, offering personalized suggestions for learning activities and resources that align with their specific needs and preferences. This has been shown to improve student engagement and motivation, leading to better learning outcomes.

Technology enables teachers to simultaneously connect with numerous students in various locations, serving as a valuable solution to address the shortage of teachers in the country. The initiative aims to enhance instructors' skills through the online portal DIKSHA, utilizing digital media for training. This digital network serves teachers nationwide, keeping them informed about innovative digital technologies and integrating a digital aspect into their professional lives; Ugur (2020). Online learning platforms, virtual learning environments, collaborative learning, AI and ML, and accessibility for learners with disabilities are just some of the contributions of digital technology in digital education in India. As the digital education

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

landscape continues to evolve, it is likely that we will see further advancements in the role that digital technology plays in transforming education in India and around the world.

The genesis of digital technology can be traced back to the early 19th century when the concept of binary code was first introduced by mathematician George Boole. Boole's work laid the foundation for modern digital computing by demonstrating that complex logical operations could be performed using a binary system of ones and zeros; Hounshell (1996).

In the early 2000s, the rise of mobile devices such as smartphones and tablets marked another major milestone in the history of digital technology. Mobile devices are designed to be portable and allow people to access the internet and other digital services from anywhere. This has created a new era of mobile computing, where people can work, shop, and communicates on-the-go; Goggin (2017). Today, digital technology continues to evolve and advance rapidly. The development of new technologies such as artificial intelligence, machine learning, and blockchain is expected to drive further innovation and create new opportunities for businesses and individuals alike**.**

REVIEW OF LITERATURE

Rajesh (2003) emphasized that the application of new ICTs in education within developing countries is challenging, and selecting the appropriate medium is crucial in achieving the objectives of using a particular medium. An examination of radio and TV as media for distance education in India highlights that access to the media, cost-effectiveness, user-friendliness, and pedagogic value are crucial factors that determine the growth and application of ICTs in education. Without adequate consideration of these factors, the use of ICTs in education will remain a formidable task.

Burn and Thongprasert (2005) conducted a research study in Thailand to pinpoint the critical success factors in implementing Virtual Education Delivery (VED) and to explore methods for enhancing its adoption to achieve effective outcomes. The study delved into three cultural factors specific to Thai culture: high power distance, uncertainty avoidance, and collectivism. A research model was formulated, detailing the conceptual foundation of the cultural model. The study outcomes were outlined, and a strategic framework was suggested for the successful implementation of VED, with adaptability to various cultural settings. Additionally, an audit instrument was developed for the assessment and review of VED outcomes.

In a study by Buchanan et al. (2013), factors influencing the use of learning technologies among higher education faculty were investigated through an online survey conducted in a UK university. The study found that barriers to adoption of learning technologies were mainly due to structural constraints within the University and perceived usefulness of the tools. The use of online learning technology was associated with both these variables, along with Internet self-efficacy. These findings align more with the unified theory of acceptance and use of technology and the decomposed theory of planned behavior, which recognize facilitating or inhibiting conditions, rather than the classic technology acceptance model (TAM).

Simuforosa (2013) highlighted that the youth of today have unprecedented access to modern technology and use it in various ways, spending a significant amount of time engaging with devices such as cell phones, smart phones, video games, and the Internet. Recent evidence suggests that this may have negative effects on academic performance, leading to concerns about the impact of technology on educational attainment. This chapter aims to provide an overview of the relationship between adolescent usage of computers and academic performance, using a case study design and qualitative research methods such as interviews and focus group discussions to gather data.

Lee (2019) highlights the significance of online technology in advancing financial literacy and examines the attitudes of leaders in financial institutions. He concludes that online tools such as financial calculators, posting of information on websites, and communication through social media can be utilized for online financial literacy education. Collaborative efforts involving government, financial regulators, and educators are crucial for the success of these initiatives.

According to Rastogi (2019), the use of technology and information and communication technology (ICT) has permeated all aspects of life, including education. Traditional methods of teaching and learning are rapidly being replaced by internet-based education systems, such as smart classes with audio and visual systems, online tutorials, and e-books. While this transformation has advantages in terms of enhancing students' knowledge base and confidence, it also has drawbacks such as students becoming less focused on class lectures and not showing expected respect to their teachers. Additionally, students are exposed to unwanted information and sometimes engage in inappropriate activities.

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

Dhawan (2020) analyzes the strengths, weaknesses, opportunities, and threats (SWOT) of online learning and emphasizes the crucial role of technology proficiency in managing global crises and enhancing education. Hence, educational institutions should equip students with the required IT competencies.
Fedorova and Skobleva (2020) assert that the number of students enrolling in online classes has been increasing rapidly over the past few years, surpassing the number of students attending classes on campus. One of the major benefits of online education is that students rarely have to physically visit the campus, thus mitigating issues such as car parking and traffic. Therefore, the current global trend of online teaching is being viewed as mutually beneficial for all universities involved in this educational system.
According to Jayprakash (2020) education is a fundamental necessity for everyone, and in today's world, digital education has become crucial for enabling learners to have a more focused and diverse learning experience. Digital education offers a quicker and more accessible way for learners to obtain information compared to traditional sources such as schools, teachers, and print media. The study aims to explore the influence of technology and digitalization on education and learning in India, employing a questionnaire survey approach. The findings indicate that significant changes are anticipated in how universities and colleges deliver education in the forthcoming years. The widespread integration of digital technologies in education and assessment is not a fleeting trend but is expected to have a lasting impact on the future of education.
According to Siripongdee et al. (2020) the shift towards online education in higher learning necessitates a shift in our perspective regarding the needs of institutions and students. Theoretical courses can be efficiently delivered through online platforms, but practical courses necessitate in-person instruction for adequate supervision and guidance of students. Consequently, technology has the capability to accommodate larger class sizes while also remaining adaptable to address the specific needs of individual students.

OBJECTIVE OF THE STUDY

- To assess the availability of Digital Technology in Education.

RESEARCH METHODOLOGY

Research Design

The descriptive research designs have been adopted for the study.

Sampling Design

Researcher has employed stratified random sampling in the present study to gather data from various respondents.

Sample Size= 400 Respondents (students)

Area of Research Study

This study has been limited to Educational Institutes in Meerut District of Uttar Pradesh. The present research study has been conducted in Meerut district based on education institutions. The students of the institutions have been considered the population.

DATA COLLECTION METHOD

Primary Data

In the present study the primary data has been collected from the students of educational institutions. The questionnaire has been designed on the basis of objective of the present study.

ANALYSIS REGARDING AVAILABILITY OF DIGITAL TECHNOLOGY IN EDUCATION

Table 1: Analysis of data for “How often do you use digital technology in your classroom?”

Components	Number of Respondents	Per Cent
Daily	68	17
A few times a week	82	20.5
Once a week	76	19
Rarely	96	24
Never	78	19.5
Total	**400**	**100**

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

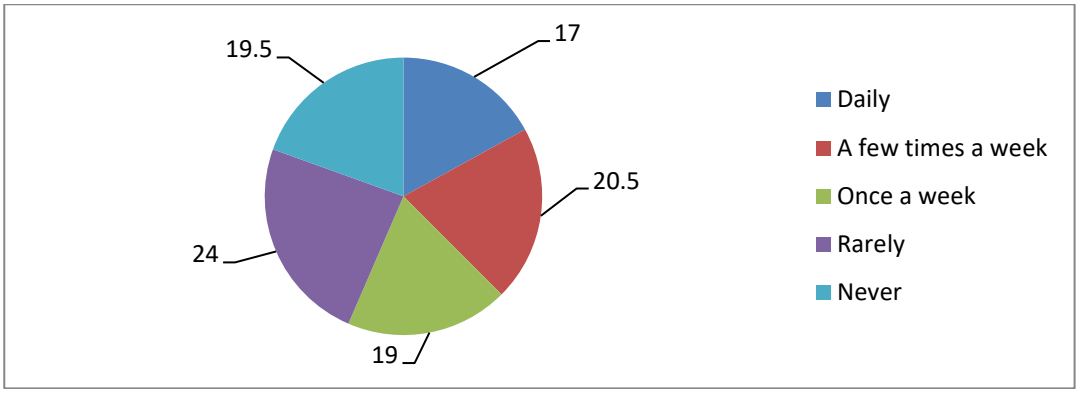

Figure 1: Analysis of data for "How often do you use digital technology in your classroom?"

Analysis: The above figure clearly shows that almost one sixth of students agreed that they used digital technology daily in their classrooms, almost one fifth at few times in a week and once a week, 24 per cent replied to rarely whereas 19.5 per cent said that they never used the digital technology in their classroom.

Table 2: Analysis of data for "How effective do you think the current digital technology available in your classroom is in improving your learning experience?"

Components	Number of Respondents	Per Cent
Highly effective	94	23.5
Moderately effective	104	26
Slightly effective	68	17
Not effective	42	10.5
Don't know	92	23
Total	**400**	**100**

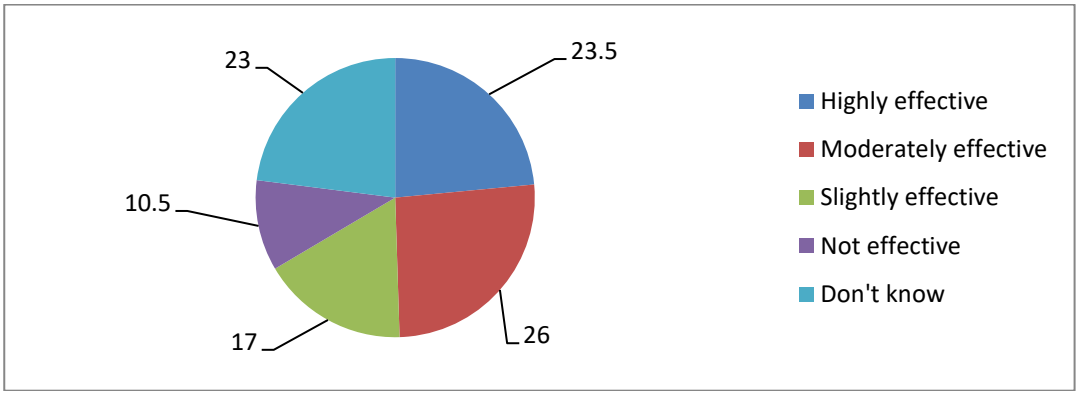

Figure 2: Analysis of data for "How effective do you think the current digital technology available in your classroom is in improving your learning experience?"

Analysis: The result reveals that majority of respondents were agreed to highly and moderately effective that the current digital technology available in their classroom is improving their learning experience, almost one sixth were agreed for slightly effective, almost one tenth were agreed for not effective and 23 per cent don't know about it.

Table 3: Analysis of data for "How easy is it for you to access digital technology in your educational institution?"

Components	Number of Respondents	Per Cent
Very easy	54	13.5
Somewhat easy	90	22.5
Neutral	58	14.5
Somewhat Difficult	106	26.5
Very difficult	92	23
Total	**400**	**100**

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

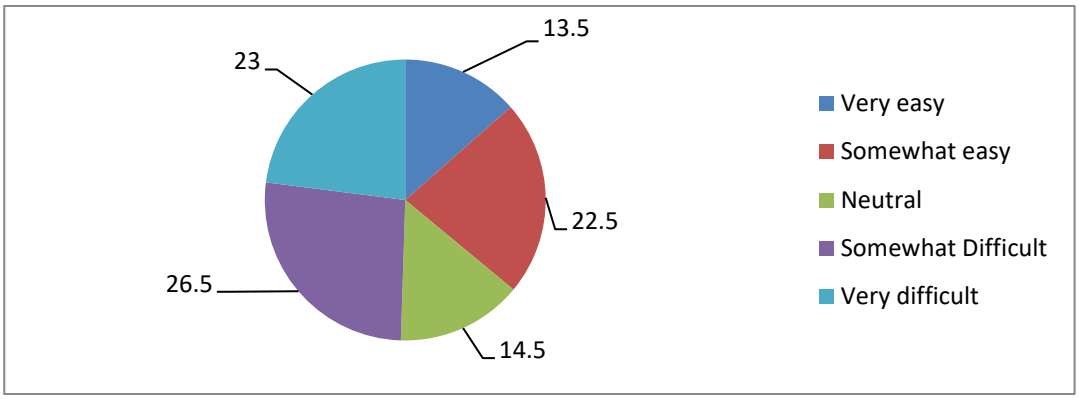

Figure 3: Analysis of data for "How easy is it for you to access digital technology in your educational institution?"

Analysis: It was found that only 13.5 per cent respondents felt very easy to access digital technology in their educational institution, 22.5 per cent for somewhat easy, 14.5 per cent were neutral, 26.5 per cent were felt somewhat difficult whereas 23 per cent agreed for very difficult.

Table 4: Analysis of data for "How do you think the availability of digital technology has impacted the quality of education in India?"

Components	Number of Respondents	Per Cent
Significantly improved	152	38
Slightly improved	122	30.5
No impact	24	6
Slightly worsened	60	15
Significantly worsened	42	10.5
Total	**400**	**100**

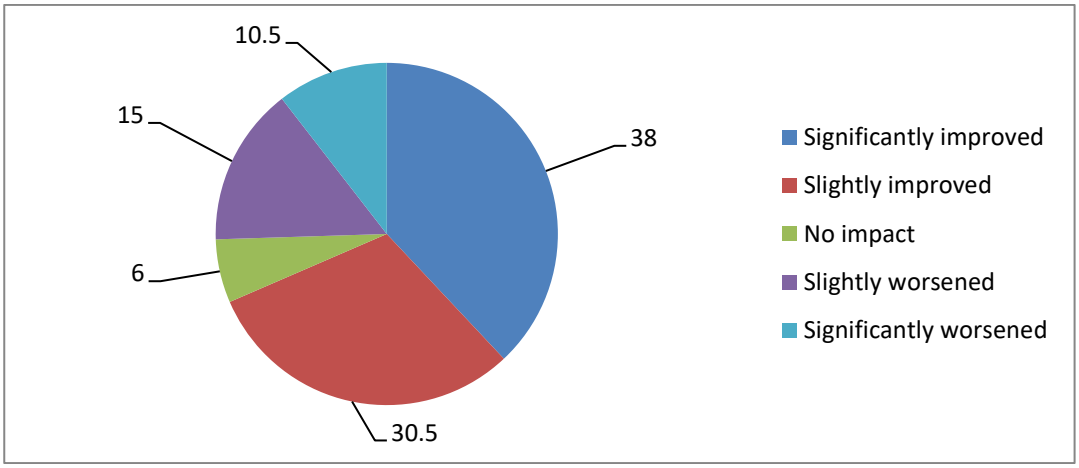

Figure 4: Analysis of data for "How do you think the availability of digital technology has impacted the quality of education in India?"

Analysis: It was found that mostly the respondents were agreed that the availability of digital technology has impacted the quality of education in India, 30.5 per cent agreed for slightly improved, only 6 per cent agreed for no impact whereas 15 per cent agreed for slightly worsened and 10.5 per cent for significantly worsened.

Table 5: Analysis of data for "What are the biggest challenges to the availability of digital technology in education in India?"

Components	Number of Respondents	Per Cent
Infrastructure	88	22
Cost	56	14
Teacher training	26	6.5

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

Student access to devices	148	37
Content Quality	82	20.5
Total	**400**	**100**

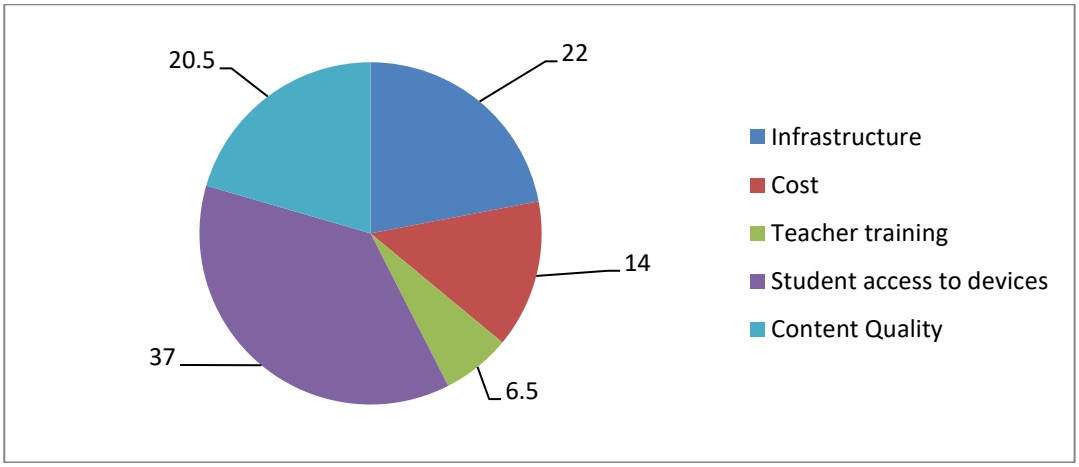

Figure 5: Analysis of data for "What are the biggest challenges to the availability of digital technology in education in India?"

Analysis: The result reveals that 22 per cent felt infrastructure is the biggest challenge to the availability of digital technology in education in India, 14 per cent agreed for cost, only 6.5 per cent agreed for teachers training, 37 per cent agreed for student access to devices and 20.5 per cent for content quality.

INTERPRETATION OF DATA RELATED TO AVAILABILITY OF DIGITAL TECHNOLOGY IN EDUCATION

1. Digital Technology Usage in Classrooms

The survey data illustrates the frequency of digital technology usage in classrooms among students. Almost one sixth of the students reported using digital technology daily, indicating a significant portion of students who have integrated technology into their daily learning routines. Additionally, almost one fifth of students reported using digital technology a few times in a week or once a week, suggesting a substantial number of students who engage with technology on a regular but less frequent basis. On the other hand, 24 percent of respondents reported rare usage of digital technology, indicating that a significant minority still have limited exposure to digital tools in the classroom. Furthermore, 19.5 percent of students reported never using digital technology in their classrooms, indicating a notable percentage of students who have not yet experienced digital integration in their learning environments.

2. Effectiveness of Digital Technology in Improving Learning Experience

The survey findings reveal that a majority of respondents viewed the current digital technology available in their classrooms as highly and moderately effective in improving their learning experience. This positive perception indicates that many students find value in using digital tools for their educational pursuits. Additionally, almost one sixth of respondents found the technology to be slightly effective, while almost one tenth considered it not effective. Moreover, 23 percent of respondents were uncertain about the effectiveness of the available digital technology. This suggests a need for further exploration and feedback to understand the varied perspectives on the impact of digital technology on learning experiences.

3. Ease of Access to Digital Technology

The survey data shows that a relatively small percentage of respondents i.e. 13.5 percent) felt very easy to access digital technology in their educational institutions. However, a larger proportion of respondents i.e. 22.5 percent found it somewhat easy to access digital technology. Additionally, 14.5 percent of respondents expressed a neutral stance on the ease of access. On the other hand, a significant percentage of respondents i.e. 26.5 percent found it somewhat difficult to access digital technology, while 23 percent found it very difficult. This indicates that there are challenges in ensuring smooth and equitable access to digital technology in educational institutions.

4. Impact of Digital Technology on Education Quality

The survey results suggest that most respondents agreed that the availability of digital technology has impacted the quality of education in India. A considerable portion i.e. 30.5 percent agreed that it has slightly

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

improved the quality of education. However, a smaller percentage i.e. 6 percent believed that digital technology had no impact on education quality. Additionally, 15 percent of respondents agreed that the impact was slightly worsened, while 10.5 percent felt that it was significantly worsened. This reveals a diversity of opinions on how digital technology influences education quality, with a majority perceiving a positive impact, but a significant minority expressing concerns or negative experiences.

5. Challenges to Digital Technology Implementation

The survey findings highlight the various challenges to the availability of digital technology in education in India. According to respondents, the biggest challenge is infrastructure, with 22 percent of them identifying it as a significant obstacle. Cost is another noteworthy concern, as indicated by 14 percent of respondents. Teachers' training was viewed as a challenge by only 6.5 percent of respondents, suggesting that educators may generally feel more equipped to integrate technology into their teaching. Student access to devices emerged as a substantial concern, with 37 percent of respondents recognizing it as a challenge. Furthermore, 20.5 percent of respondents noted content quality as an area requiring attention. These findings underline the importance of addressing infrastructure limitations, cost barriers, and ensuring equitable access to devices and quality educational content to facilitate successful integration of digital technology in education.

CONCLUSION

In the present research study the following points have been included to analyze the availability of digital technology in education: digital technology usage in classrooms, effectiveness of digital technology in improving learning experience, ease of access to digital technology, impact of digital technology on education quality, challenges to digital technology implementation. The analysis of students' responses regarding the availability of digital technology in education in India provides valuable insights into the current state of digital integration and its impact on the learning experience. The results reveal that while a significant portion of students have embraced digital technology in their classrooms, there are still students who have limited exposure to such tools. The perceived effectiveness of digital technology in improving the learning experience highlights its potential value, but diverse opinions exist on this matter, warranting further exploration and feedback. Challenges such as infrastructure limitations, cost barriers, and access to devices and quality content are prevalent, underscoring the need for comprehensive strategies to address these obstacles.

REFERENCES

- Buchanan, T., Sainter, P. & Saunders, G. (2013). Factors Affecting Faculty Use of Learning Technologies: Implications for Models of Technology Adoption. *Journal of Computing in Higher Education,* 25(1), 1-11.
- Burn, J. & Thongprasert, N. (2005). A culture-based model for strategic implementation of virtual education delivery. *International Journal of Education and Development using ICT,* 1(1), 32-52.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems,* 49(1), 5-22.
- Fedorova, E.P. and Skobleva, E.I. (2020). Application of Blockchain Technology in Higher Education, *European Journal of Contemporary Education,* 9(3) 552-571.
- Hounshell, D. A. (1996). The evolution of industrial research in the United States. Cambridge University Press.
- Jayaprakash, M.G. (2020). Impact of Technology and Digitization in Indian Education and Learning: A Critical Analysis, *Ilkogretim Online - Elementary Education Online*, 19(4), 7676-7681.
- Lee, H. W. (2019). Applying Online Educational Technology to Foster Financial Literacy: Financial-Institution Leaders' Insights. *The Qualitative Report*, 24(10), 2625-2654.
- Rajesh, M. (2003). A Study of the problems associated with ICT adaptability in Developing Countries in the context of Distance Education, *Turkish Online Journal of Distance Education*, 4(2).
- Rastogi, H. (2019). Digitalization of education in India – An analysis, *International Journal of Research and Analytical Reviews,* 6(1), 160-167.
- Simuforosa, M. (2013). The Impact of Modern Technology on the Educational Attainment of Adolescents, *International Journal of Education and Research*, 1(9), 1- 8.
- Siripongdee, K., Pimdee, P., & Tuntiwongwanich, S. (2020). A blended learning model with IoT-based technology: Effectively used when the COVID-19 pandemic? *Journal of Education and Gifted Young Scientists*, 8(3), 905-917.

iJETRM
International Journal of Engineering Technology Research & Management
www.ijetrm.com

- Ugur, N. G. (2020). Digitalization in higher education: A qualitative approach. *International Journal of Technology in Education and Science*, 4(1), 18-25.