77

Digital Transformation in Higher Education

Dr. Priya Rao

Director-IQAC,

Avantika University, Ujjain, India

Dr. Nitin M Rane

Vice Chancellor,

Avantika University, Ujjain, India

Dr. Balasaheb Bhagaji Waphare

Principal,

MAEER'S MIT Arts, Commerce and Science College, Alandi, Pune

The digital transformation of higher education is rapidly reshaping the landscape of learning and teaching. In 2024, this evolution is anticipated to accelerate further, driven by emerging technologies and innovations aimed at enhancing the educational experience. Online learning stands out as a prominent trend in higher education's digital transformation. Offering students flexibility and affordability, online learning allows them to learn at their own pace and schedule. This trend is expected to continue growing in 2024, with more universities offering online courses and programs to meet the diverse needs of learners.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047**"

Page No. 1151

Artificial intelligence (AI) is another key trend shaping higher education. AI applications personalize learning experiences, provide feedback to students, and also assist in grading assignments. In 2024, AI is forecasted to become more sophisticated and widely integrated into higher education, revolutionizing how students learn and educators teach. The digital transformation of higher education presents both challenges and opportunities. However, by embracing new technologies and innovations, universities can create more engaging and effective learning experiences for students. As this field continues to evolve, higher education institutions must remain agile and proactive in adapting to the changing landscape to best serve the needs of their students and educators alike.

The digital transformation of higher education integrates eLearning technologies and offers innovative solutions to traditional learning challenges. Students can access a greater range of instructional resources and instructors through eLearning. E-learning allows students to obtain access to a variety of course offerings and expertise. It is useful for students who want to study a specific topic or field but have no access to it at their local college or institution.

Sorts of eLearning

The digital eLearning is available in several types of methods in college campuses including following methods.

1.   Adaptive and Fixed eLearning

Fixed eLearning, also known as linear or static eLearning, follows a predetermined structure where all learners progress through the same content in a uniform manner. Adaptive eLearning, on the other hand, tailors the learning experience to individual learner needs, adjusting content, pace, and difficulty level based on learner performance, preferences, and proficiency

2.   Synchronous and Asynchronous eLearning

Asynchronous eLearning refers to learning activities that learners engage in at their own pace and time, without the need for real-time interaction with professors or peers. Synchronous eLearning involves real-time interaction between learners, instructors, and peers through live sessions or virtual classrooms, such as Zoom meetings, Google Meet, online classes etc.
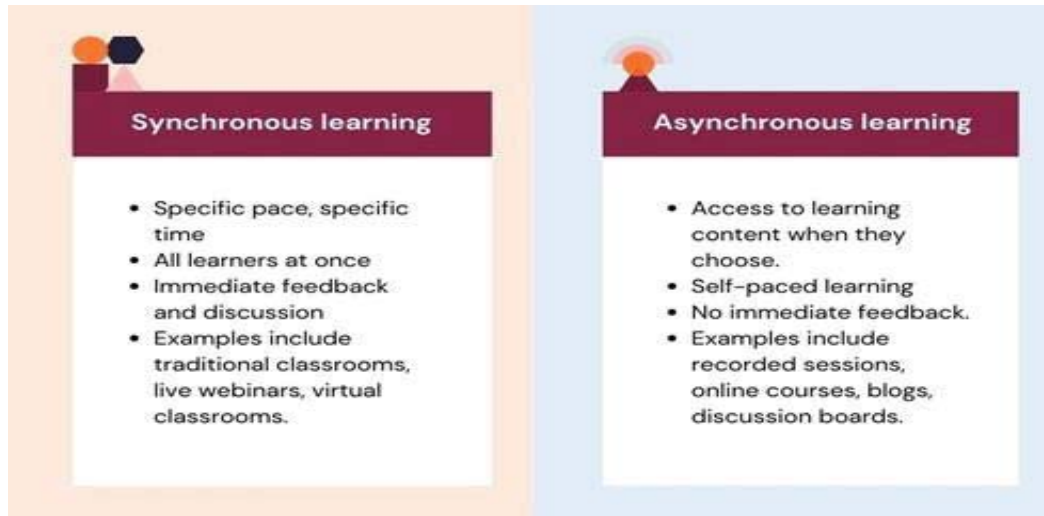
Vidhyayana - ISSN 2454-8596

An International Multidisciplinary Peer-Reviewed E-Journal
www.vidhyayanaejournal.org
Indexed in: Crossref, ROAD & Google Scholar

Synchronous learning
- Specific pace, specific time
- All learners at once
- Immediate feedback and discussion
- Examples include traditional classrooms, live webinars, virtual classrooms.

Asynchronous learning
- Access to learning content when they choose.
- Self-paced learning
- No immediate feedback.
- Examples include recorded sessions, online courses, blogs, discussion boards.

Fig 1: Difference between Synchronous learning and Asynchronous learning (Leah Zitter, 2022).

3. Interactive, collaborative eLearning vs individual eLearning

Collaborative learning involves students working together in groups or pairs, often facilitated by a teacher or professor, to achieve shared learning goals. This approach encourages interaction, discussion, and cooperation among peers, promoting active engagement and a deeper understanding of the material through shared exploration and problem-solving.

On the other hand, individual learning refers to students studying independently, often at their own pace and without direct collaboration with peers, while students are responsible for managing their own learning process, which may involve reading textbooks, completing assignments, conducting research, or watching educational videos.

4. Remote learning vs online learning

Remote learning refers to the delivery of education to students who are geographically separated from the professor or educational institution. Online learning, also known as distance education or eLearning, refers to the delivery of education entirely through digital technologies and the Internet.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047**"

Page No. 1153

During the pandemic (COVID 2019), students rely on digital tools and platforms like Zoom and Birthplace to continue their education remotely. These tools facilitate remote learning by enabling live video conferencing, virtual classrooms, and interactive discussions among students and teachers, such as Coursera.

5.   eLearning vs. digital learning

eLearning is a short form of electronic learning, which refers to the use of electronic technologies to deliver educational content and facilitate learning experiences. Digital learning encompasses a broader range of educational approaches and activities that leverage digital technologies to enhance learning experiences.

6.   MOOC vs. SPOC

MOOCs (massive open online course) are online courses intended to be reachable to a big number of students worldwide, SPOCs (small private online course) are online courses designed for smaller groups of learners, typically within a specific institution or organization, online courses deliver training using downloadable documents, videos, etc.

7.   Virtual classes vs. mobile learning

Virtual classes refer to live, interactive teaching sessions conducted online, typically using video conferencing software or virtual classroom platforms. Mobile learning, or mLearning, is the utilisation of mobile devices, including tablets and smartphones, for accessing learning materials and participate in learning activities. Example: virtual classroom such as Zoom.

8.   Social vs. adaptive learning

Social learning, also known as social and collaborative learning, social learning emphasizes the importance of interaction, collaboration, and shared experiences among learners in the educational process, such as group discussions on Zoom. Adaptive learning is a personalized approach to education that leverages technology to adapt instruction and learning experiences to individual learner needs and preferences.

Benefits to Higher Education

Fig 2: Benefits of digital transformation in higher education (Tristan Ovington, 2023)

Digital transformation in education offers numerous benefits, many of which revolve around the collection and analysis of student data to support their academic development and success.

1.   Performance tracking for students

Technology plays a crucial role in enabling educators and parents to monitor students' progress more efficiently and effectively. By digitizing various aspects of students' work, such as handwriting samples, creative projects, and academic assessments, educators can gain valuable insights into individual student performance and identify areas for improvement.

2.   Optimized outcomes using accurate data analytics

Analysing data collected through students' use of technology in the classroom can provide valuable insights that help educators track performance and improve outcomes. Data analysis enables educators to identify patterns and trends in student performance, allowing them to tailor instruction to meet the individual needs of students. By understanding each student's strengths, weaknesses, and learning preferences, teachers can provide targeted support and interventions that maximize learning outcomes.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
*"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047"***

Page No. 1155

3. Collaborative learning experiences

Digital learning has revolutionized collaboration in education by providing teachers and students with a wide range of tools and platforms to work together more effectively. Learning platforms allow teachers to easily create and manage groups of students based on their interests, abilities, or projects. These groups can collaborate on assignments, projects, and discussions, fostering teamwork and peer learning. tools like Google Docs, Twiddle, and Edmodo enable students to collaborate in real time on documents, presentations, and projects. Multiple users can simultaneously edit and contribute to a single document, facilitating seamless collaboration and collective problem-solving.
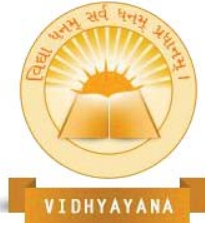
4. Curricula focused on the future

Integrating future-oriented subjects such as robotics, artificial intelligence, and automation into school curricula is crucial to preparing students for the rapidly evolving workforce and technological landscape. skills related to robotics, artificial intelligence, and automation are becoming increasingly valuable in the workforce. By introducing these subjects in schools, students are better prepared to meet the demands of future job markets and pursue careers in emerging fields.

Future-oriented subjects provide students with opportunities to apply theoretical knowledge to real-world problems and challenges. Hands-on experiences with robotics, AI programming, and automation systems enable students to develop practical skills and problem-solving abilities that are highly sought after by employers.

5. Stronger teacher-parent synergies

Parental engagement in their children's academic progress plays a crucial role in supporting student success and well-being. Automation enables schools to electronically deliver progress reports and attendance updates to parents in a timely and efficient manner. By automating the process of sending out these reports, parents receive timely updates on their child's academic performance and attendance, allowing them to stay informed and involved in their child's education.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
*"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047**"*

Page No. 1156

6. Time-saving opportunities

In today's fast-paced world where time is of the essence, digital transformation can offer significant time-saving benefits, especially for students facing long commutes to educational institutions. In many cities, especially outside of metropolitan areas, access to a fully developed public transport system may be limited, resulting in students spending several hours commuting each day, digital courses can provide a valuable solution for students, regardless of their geographic location.

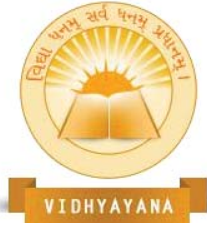### Challenges of Digital Transformation

Fig 3: Challenges in Higher Education.

The challenges in the digital transformation of higher education can be summarized as follows:

1. Prioritization

Universities often prioritize urgent tasks over important long-term investments, favouring immediate results over critical capability-building efforts. This tendency can lead to delayed or inadequate digitization efforts, as institutions may lack the necessary resources or strategic planning to execute comprehensive digital transformation initiatives effectively. To address this challenge, developing a prioritization plan for digital investments is essential. This plan should outline a roadmap for systematic organizational transformation, guiding the allocation of resources and efforts in a sequential manner. By establishing clear priorities and investing strategically in digital capabilities, universities can overcome the tendency to focus solely on urgent matters and ensure sustainable progress towards digital maturity.

Volume 10, Special Issue 1, October 2024

"An International Multi-disciplinary, Multi-lingual Online Conference on"
*"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047"***

Page No. 1157

1. Decentralised Decision Making

When decision-making in universities is decentralised, it leads to adjournments in implementing large-scale resolutions in addition to projects. Conversely, when control as well as decision-making is centralized within IT systems are often effective. Balancing scale and speed in decision-making coordination is crucial. To ensure success, an organizing model for digital transformation should be dynamic ambidextrous. This model aims to balance separation and integration over time, allowing universities to leverage the benefits of decentralized decision-making while maintaining efficiency through centralized control when necessary. By adopting this approach, universities can navigate the complexities of digital transformation effectively and achieve their strategic objectives in a timely manner.

2. Human Resistance to Change

Higher education institutions face the primary challenge of the resistance to change among faculty members, in their journey towards digital transformation. This resistance can significantly hinder the adoption of digital technologies, especially when it involves adapting to new teaching methods, learning settings, and models. Academic professionals, who often prioritize job security, may be apprehensive about changes that threaten their stability. To overcome this obstacle, successful organizations promote a vision of digital maturity among their staff. Implementing small-scale pilot projects can offer tangible evidence of the potential benefits of change, thereby easing uncertainties or doubts surrounding job security. Additionally, it is crucial to develop orientations and training programs tailored to educational professionals, emphasizing the positive aspects of technology adoption while addressing concerns about job insecurity. By nurturing a culture of openness to change and providing adequate support and education, institutions can effectively overcome resistance and facilitate a smooth transition towards digital transformation.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
*"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047**"*

Page No. 1158

3. Digital Tech Talent Gaps

The lower digital literacy among faculty members presents a significant hurdle in higher education institutes' journey toward digital transformation. The advent of new teaching approaches as well as learning tools, such as digital platforms, video conferencing, learning using simulation and collaborative tools, necessitates adaptation by faculty members. As higher education systems strive to keep pace with global developments, embracing new teaching paradigms and environments becomes imperative. Given that current students are digital natives, faculty members must innovate in their digital teaching approaches to engage effectively. Another challenge in integrating digital technologies successfully is the generational gap between tech-savvy students and faculty members who may require learning and adaptation. Addressing this gap entails policies that promote infrastructure development and foster conducive learning environments. Moreover, there is a pressing need for faculty training to enhance their digital competencies, enabling them to leverage technology effectively in their teaching practices. By addressing these challenges comprehensively, higher education institutions can navigate the complexities of digital transformation and better prepare students for success in the digital age.

4. Fine ROI View

Finally, it's observed that institutions of higher education often commit mistakes while assessing the business case or ROI (return on investment) for the digital efforts. Business cases for basic digital skills must encompass gradually evolving or challenging actions to quantify. For instance, they should consider more competent operations as well as automation to save costs and time of faculty. Additionally, they should account for better enrolment, retention, and on-time graduation rates resulting from the improved student experience facilitated by digital transformation initiatives. By accurately assessing these benefits alongside traditional ROI metrics, universities can better justify their digital investments and realize the full potential of their transformation efforts.

Digital Transformation Trends

eLearning notes that there are two main business areas that digital transformation is affecting:

- **Service**

Digital transformation often involves creating new products and services while also updating existing ones to leverage digital technologies and meet the evolving needs of users.

Example: While offering online programs, educational institutions may create new online programs, such as an online MBA program, to cater to students who prefer the flexibility and accessibility of online learning. These programs provide students with the opportunity to earn a degree remotely, typically through a combination of asynchronous coursework, virtual lectures, and online collaboration tools.

- **Operations**

Digital transformation is revolutionizing various administrative processes in education, making them more efficient, accessible, and user-friendly.

Example: In Admission and Graduation Applications, educational institutions are increasingly adopting digital platforms and online portals for students to apply for admission to programs or courses and to submit graduation applications. These digital systems streamline the application process, allowing students to submit required documents, pay fees, and track their application status online.

eLearning highlights several trends through which colleges and universities are implementing their digital transformation strategies:

1. **The Internet of Things (IoT)**

The IoT involves connecting everyday objects and devices to the internet, enabling them to collect and exchange data, communicate with each other, and be remotely monitored and controlled. In higher education institutions, the IoT can be leveraged to enhance campus operations, resource management, and sustainability efforts.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
*"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047**"*

Page No. 1160

For example, intelligent thermostats can regulate heating and cooling systems based on occupancy patterns and ambient temperatures, ensuring that classrooms and other campus spaces are only heated or cooled when necessary. Similarly, smart lighting systems can adjust brightness levels and turn off lights in unoccupied areas to conserve electricity.

2. Security

As educational institutions increasingly leverage IoT devices and collect vast amounts of student data, cybersecurity becomes a top concern. The expansion of IoT devices amplifies the potential attack surface and increases the volume of sensitive information that could be compromised if adequate security measures are not in place. By leveraging UEBA technologies, institutions can identify and respond to cybersecurity incidents in real time, enhancing their ability to protect student data and mitigate risks. Additionally, UEBA solutions enable proactive threat hunting and incident response, helping educational institutions stay ahead of emerging security threats.

3. Augmented Reality & Virtual Reality

AR and VR technologies are revolutionizing education by providing immersive, interactive, and engaging learning experiences that enhance student learning outcomes, foster collaboration and creativity, and prepare students for success in the digital age. Colleges and universities are embracing AR and VR as part of their digital transformation strategies to create more dynamic, inclusive, and effective learning environments for students.

4. Blockchain Technology

Blockchain technology is revolutionizing various aspects of education, offering new opportunities for data management, credential verification, and secure transactions.

Example: In Credential Verification, blockchain technology enables colleges and universities to securely issue, store, and verify academic credentials, such as degrees, diplomas, certificates, and transcripts. By recording academic achievements on a blockchain-based credentialing system, institutions can ensure the integrity, authenticity, and immutability of student records, preventing fraud and unauthorized alterations. Students can share their digital credentials with

employers, educational institutions, and other stakeholders, allowing for seamless verification of qualifications and credentials across borders and institutions.

5. Artificial Intelligence & Machine Learning

Artificial Intelligence (AI) and Machine Learning (ML) are revolutionizing various aspects of education, including teaching, learning, student support, and administrative processes. AI and ML algorithms analyse student data, learning preferences, and performance metrics to personalize learning experiences and tailor instruction to individual needs. AI-driven automation tools reduce manual tasks, save time, and optimize resource allocation, enabling staff to focus on more strategic initiatives and student-facing activities.

6. Chatbots

Colleges and universities deploy AI-powered virtual assistants and chatbots to provide instant support and assistance to students, faculty, and staff. Virtual assistants can answer questions, provide information about courses, programs, and campus services, schedule appointments, and offer personalized recommendations.

7. ADA Compliance

Making education accessible to everyone is a fundamental requirement under the Americans with Disabilities Act (ADA), and digital transformation plays a crucial role in enabling colleges and universities to meet and exceed these accessibility standards. Transcription services, in particular, are invaluable tools that can greatly enhance the learning experience for hearing-impaired students by providing them with accurate and comprehensive access to lecture content.

8. Big Data Analytics

Big data analytics refers to the process of analysing large and complex datasets to uncover insights, patterns, and trends that can inform decision-making and drive innovation. In higher education, big data analytics involves leveraging advanced analytical techniques and technologies to analyse vast amounts of data collected from various sources within the

institution, including student information systems, learning management systems, financial records, research databases, and administrative systems.

Growth of the Global Digital Education Market

The landscape of education is rapidly evolving, with online learning becoming increasingly mainstream alongside traditional classroom-based education. Digital technologies are integrated into classroom settings to enhance content delivery and student engagement. Particularly in the United States, the COVID-19 pandemic has accelerated the adoption of online learning, with 66% of Americans showing increased motivation to seek out online educational opportunities.
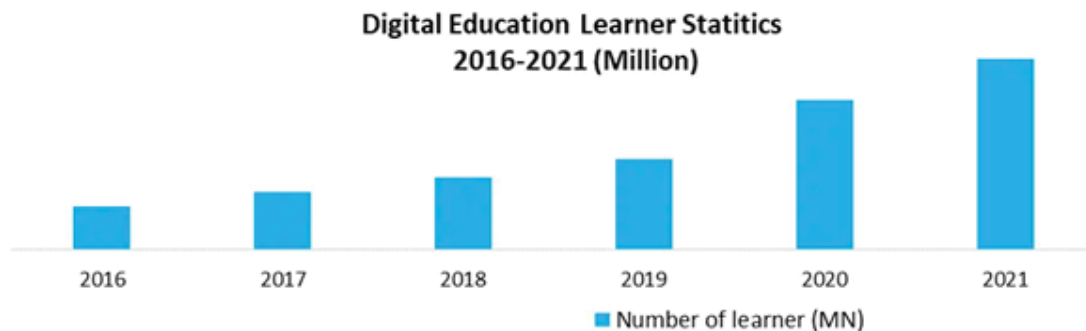

Fig 4: Digital Education Learner Statistics (MMR, 2023).

This surge in demand for online learning presents a significant opportunity for creators and companies operating within the knowledge economy, with expectations of exponential growth. In 2022, the top 10 educational institutions experienced a notable 10% increase in online enrolment compared to traditional enrolment methods.

Moreover, there is a growing interest among high school students in online programming courses, with 42% of them being females and 62% males. Notably, a substantial portion of online learners, totalling more than 41.6%, are individuals aged 30 and above, highlighting the appeal of online education to adult learners seeking to enhance their skills or pursue career advancement opportunities.

Volume 10, Special Issue 1, October 2024
"An International Multi-disciplinary, Multi-lingual Online Conference on"
*"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047"***

Page No. 1163

Fig 5: Growth of market size in US$ Billion (MMR, 2023).

The projected growth of the online education market in India is indeed substantial. According to your provided information, it's expected to reach US$ 6.87 billion by 2029.
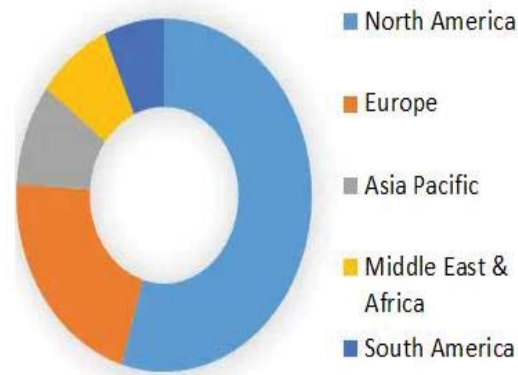

Fig 6: Regional Analysis in 2022 (%) (MMR, 2023).

Percentages of digital transformation within higher education across different regions:

- North America: 55%

- South America: 5%

- Middle East: 7%

- Asia Pacific: 10%

- Europe: 23%

These percentages represent the approximate distribution of digital transformation efforts in higher education across these regions. It suggests that North America has the highest level of digital transformation in this sector, followed by Europe, Asia Pacific, the Middle East, and South America, respectively.
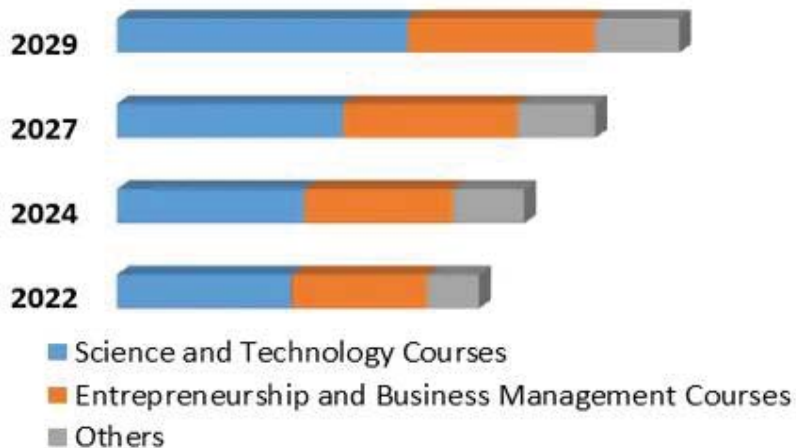

Fig 7: Course Type Segment Overview (MMR, 2023).

The Indian government is taking significant strides to advance digital education in the country, recognizing the importance of digitization in higher education. With universities and colleges increasingly adopting digital technologies, coupled with growing internet penetration and student demand, India is moving towards a digital education landscape.

According to an analysis by MMR (MMR, 2023), the online education market in India is projected to reach US$ 6.87 billion by 2029, particularly in higher education. This growth is attributed to the government's focus on integrating online education programs, bolstering digital infrastructure, and addressing the rising demand for upskilling among students.

Government initiatives are aimed at elevating the standard of digital infrastructure across India to facilitate the effective utilization of innovative educational tools. These efforts are geared towards creating an environment conducive to digital learning, ensuring accessibility and quality education for all students across the nation.

Volume 10, Special Issue 1, October 2024

"An International Multi-disciplinary, Multi-lingual Online Conference on"
"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a Viksit Bharat@2047"

Page No. 1165

References:

1. MMR (2023), "Digital Education Market: Global Industry Analysis and Forecast 2023-2029", https://www.maximizemarketresearch.com/market-report/global-digital-education-market/

2. Tristan Ovington (2023), "Digital transformation in education: Deliver the right technology", https://www.digital-adoption.com/digital-transformation-in-education/

3. Leah Zitter (2022), "Digital Transformation of Higher Education in 2024 (+Examples)", https://whatfix.com/blog/digital-transformation-in-higher-education/

Volume 10, Special Issue 1, October 2024

"An International Multi-disciplinary, Multi-lingual Online Conference on"
"From Tradition (IKS) to Tomorrow (NEP 2020): Multidisciplinary Conference for a **Viksit Bharat@2047"**

Page No. 1166