



PROSPECTS OF ARTIFICIAL INTELLIGENCE (AI) AND PERSONALIZED LEARNING IN INCLUSIVE EDUCATION INTEGRATED TO THE NATIONAL EDUCATION POLICY (NEP) - 2020

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26	Designing Learner-Centric Adaptive Learning Platforms: Insights from NEP 2020 Dr. G. Nithya	132
27	AI Enabled Personalized Learning for Inclusive Classrooms under NEP 2020 Dr. B. Rohini	136
28	Learner-Centric Digital Pedagogy: Adaptive Learning Platform Design in Line with NEP 2020 Dr. S. Kokilavizhi	142
29	Emotional Intelligence and Leadership Effectiveness in AI- Driven Organizations: A NEP 2020 Perspective Dr. T. Kiruthika	148
30	Ethical Considerations & Data Privacy (Collecting and Analyzing Sensitive Student Data for Personalization) Dr. G. Vignesh & Ms. B. Sri Durga	153
31	Aligning Artificial Intelligence and Yoga-Based Wellness with NEP 2020 for Inclusive and Personalized Education Dr. T. Sumadhi	157
32	Bridging the Critical Gap between Digital Proficiency and Employability Competence among Rural Students in Tamil Nadu's IT Sector Abhishek Narayan J	164
33	Building Teacher AI Literacy emphasized by the NEP 2020 Balamurugan R	172
34	From Policy to Practice: A Case Study on AI-Enabled Personalized Learning for Inclusive Education under NEP 2020 Dr. D. Padma & Mrs. S. Vishnu Priya	177
35	An Analysis on Adoption of Artificial Intelligence in Learning- Balancing Benefits and Risks among Commerce Students of selected Colleges at Coimbatore Region M. Akilesh, P. Sree Ram & Dr. S. Subha	181
36	Designing Adaptive Learning Platforms with NEP 2020's Learner Centric Approach B. Dharshinivishnupriya & Dr. R. Velmurugan	190
37	Artificial Intelligence in English Language Teaching: Aligning ELT with NEP 2020 Mr. M. Vairamuthu	199
38	Digital Application of NEP 2020 in Higher Education Dr. R. Ramya	202

LEARNER-CENTRIC DIGITAL PEDAGOGY: ADAPTIVE LEARNING PLATFORM DESIGN IN LINE WITH NEP 2020

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Abstract

The National Education Policy (NEP) 2020 emphasizes a paradigm shift from teacher-centered instruction to learner-centric education, promoting personalization, flexibility, and holistic development. In this context, adaptive learning platforms emerge as powerful digital tools capable of addressing diverse learner needs through personalized content delivery, real-time feedback, and data-driven instructional strategies. This research article explores the principles of learner-centric digital pedagogy outlined in NEP 2020 and proposes a design framework for adaptive learning platforms aligned with these principles. The study highlights key pedagogical, technological, and assessment-related components necessary for implementing effective adaptive learning systems in Indian education. The paper concludes by discussing challenges, opportunities, and future directions for learner-centric adaptive learning environments.

Keywords: NEP 2020, Learner-Centric Pedagogy, Adaptive Learning, Digital Education, Personalized Learning

Introduction

The rapid integration of digital technologies in education has transformed traditional teaching–learning processes. However, many digital platforms still replicate teacher-centric models, limiting learner autonomy and personalization. Recognizing this gap, the National Education Policy (NEP) 2020 advocates for learner-centric, flexible, and competency-based education supported by technology.

Adaptive learning platforms, powered by data analytics and artificial intelligence, enable personalized learning pathways tailored to individual learner needs, preferences, and pace. This research examines how adaptive learning platform design can operationalize NEP 2020's learner-centric vision and enhance digital pedagogy in contemporary educational contexts.

Learner-Centric Pedagogy

Learner-centric pedagogy is an educational approach that places the learner at the core of the teaching–learning process. Unlike traditional teacher-centered models, this pedagogy emphasizes learners' individual needs, interests, abilities, and learning pace. The primary goal is to promote active engagement, autonomy, and meaningful learning rather than passive knowledge transmission.

In learner-centric pedagogy, students actively participate in constructing knowledge through exploration, collaboration, reflection, and problem-solving. Teachers act as facilitators, mentors, and guides who design learning experiences that encourage critical thinking and self-directed learning. This approach fosters deeper understanding, creativity, and lifelong learning skills.

Key Characteristics of Learner-Centric Pedagogy Include

- Personalized learning pathways,
- Experiential and inquiry-based learning,
- Continuous formative assessment, and
- Flexible curriculum design.

Learning environments are designed to accommodate diverse learning styles and promote inclusivity. Digital technologies further enhance learner-centric pedagogy by enabling adaptive content delivery, real-time feedback, and self-paced learning.

The National Education Policy (NEP) 2020 strongly advocates learner-centric pedagogy, emphasizing competency-based education, holistic development, and the integration of technology for personalized learning. By aligning pedagogical practices with learners' needs and real-world contexts, learner-centric pedagogy supports the development of critical thinking, creativity, and problem-solving skills essential for the 21st century.

Adaptive Learning

Adaptive learning is a technology-enabled instructional approach that personalizes the learning experience by dynamically adjusting content, pace, and assessment based on individual learner performance, preferences, and needs. Unlike traditional one-size-fits-all instruction, adaptive learning systems continuously analyze learner data to deliver tailored learning pathways that support mastery and engagement.

Adaptive learning platforms use data analytics, artificial intelligence, and learning algorithms to monitor learner progress in real time. Based on learner responses, the system identifies strengths, learning gaps, and misconceptions, and accordingly recommends suitable learning resources, activities, or assessments. This ensures that learners receive targeted support while progressing at their own pace.

Key Features of Adaptive Learning Include

- Personalized content delivery,
- Diagnostic and formative assessments,
- Real-time feedback, learning analytics,
- Self-paced progression.

These features promote learner autonomy, improve learning outcomes, and enhance motivation by aligning instruction with individual learning needs.

Adaptive learning aligns closely with learner-centric pedagogy and the principles of the National Education Policy (NEP) 2020, which emphasizes personalization, competency-

based education, and effective integration of digital technologies. When implemented effectively, adaptive learning systems can support inclusive, flexible, and outcome-oriented education, making them a critical component of modern digital pedagogy.

Digital Education

Digital education refers to the use of digital technologies, platforms, and resources to facilitate teaching, learning, and assessment. It encompasses online learning, blended learning, virtual classrooms, learning management systems, educational apps, and emerging technologies such as artificial intelligence, learning analytics, and virtual reality. Digital education enables learning to occur beyond the constraints of time and physical classrooms.

A key advantage of digital education is its ability to support personalized and learner-centric learning experiences. Through adaptive content delivery, interactive multimedia, and real-time feedback, digital education caters to diverse learning needs and learning styles. It also promotes self-paced learning, collaboration, and access to a wide range of learning resources.

The National Education Policy (NEP) 2020 recognizes digital education as a vital enabler for improving access, equity, and quality in education. The policy emphasizes the integration of technology to support flexible learning pathways, teacher professional development, multilingual content, and inclusive education. National initiatives such as DIKSHA, SWAYAM, and virtual labs exemplify NEP 2020's digital education vision.

Despite its potential, digital education faces challenges such as the digital divide, infrastructure limitations, and concerns related to data privacy and teacher preparedness. Addressing these challenges requires strategic planning, policy support, and capacity building to ensure that digital education effectively contributes to learner-centric and inclusive educational transformation.

Personalized Learning

Personalized learning is an educational approach that tailors learning experiences to individual learners' needs, abilities, interests, and pace. Rather than delivering uniform instruction to all learners, personalized learning adapts curriculum, teaching strategies, and assessment methods to support each learner's unique learning journey. The primary aim is to enhance learner engagement, mastery, and autonomy.

Personalized learning environments emphasize learner choice, flexible learning pathways, and competency-based progression. Learners are encouraged to take ownership of their learning through goal setting, self-assessment, and reflection. Teachers function as facilitators and mentors, guiding learners based on data-informed insights rather than standardized instructional plans.

Digital technologies play a crucial role in enabling personalized learning. Adaptive learning platforms, learning analytics, and artificial intelligence analyze learner data to recommend customized content, activities, and assessments. These tools provide real-time

feedback and targeted interventions, helping learners address learning gaps and progress at their own pace.

The National Education Policy (NEP) 2020 strongly supports personalized learning as part of its learner-centric vision. By promoting flexibility, multidisciplinary learning, and technology-enabled education, NEP 2020 positions personalized learning as a key strategy for improving learning outcomes, inclusivity, and holistic development. When effectively implemented, personalized learning fosters critical thinking, creativity, and lifelong learning skills essential for the 21st century.

Challenges for Learner-Centric Adaptive Learning Environments

Challenges

Despite their transformative potential, learner-centric adaptive learning environments face several challenges. One of the most significant barriers is the **digital divide**, particularly in developing regions, where limited access to devices, reliable internet connectivity, and digital infrastructure restricts equitable participation. This undermines the inclusive goals of learner-centric education.

Another major challenge is **data privacy and ethical concerns**. Adaptive learning systems rely heavily on learner data to personalize instruction, raising issues related to data security, consent, transparency, and algorithmic bias. Ensuring ethical data usage and compliance with regulatory frameworks remains a critical concern.

Teacher preparedness and resistance to change also pose challenges. Many educators lack adequate training in using adaptive technologies or integrating them effectively into pedagogy. Without proper professional development, adaptive platforms risk being underutilized or misaligned with curricular goals.

Additionally, the **high cost of development and maintenance** of adaptive learning platforms—particularly those incorporating artificial intelligence—can limit scalability. Designing contextually relevant, multilingual, and curriculum-aligned content further adds to complexity.

Opportunities for Learner-Centric Adaptive Learning Environments

Learner-centric adaptive learning environments offer substantial opportunities to enhance educational quality and outcomes. One of the key advantages is **personalized learning at scale**, enabling institutions to address diverse learner needs while maintaining consistency in learning standards.

These environments support **competency-based education** by allowing learners to progress based on mastery rather than time, aligning closely with NEP 2020's focus on learning outcomes. Continuous formative assessment and real-time feedback help identify learning gaps early and provide targeted interventions.

Adaptive learning platforms also promote **learner autonomy and engagement** by offering flexible learning pathways, self-paced progression, and interactive content. This fosters motivation, self-regulation, and lifelong learning skills.

From an institutional perspective, **learning analytics and data-driven decision-making** offer insights into learner performance, curriculum effectiveness, and instructional design, enabling continuous improvement of teaching-learning processes.

Conclusion

Learner-centric adaptive learning platforms represent a significant step toward realizing the vision of NEP 2020, which emphasizes personalized, flexible, and competency-based education. By leveraging digital technologies, artificial intelligence, and data-driven insights, these platforms can provide customized learning pathways, real-time feedback, and continuous assessment, ensuring that learners progress at their own pace and according to their individual needs.

While challenges such as the digital divide, data privacy, and teacher readiness persist, the opportunities for enhancing learner engagement, autonomy, and holistic development are substantial. Effective implementation of adaptive learning systems can support inclusive education, foster critical thinking and creativity, and strengthen lifelong learning skills.

Future directions point to the integration of advanced AI technologies, accessible and multilingual content, and alignment with national digital ecosystems to ensure scalability and sustainability. In conclusion, when thoughtfully designed and pedagogically aligned, learner-centric adaptive learning environments have the potential to transform education in India, making it more personalized, equitable, and aligned with 21st-century learning goals.

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