

## **Digital Pedagogy in Educational Landscape: Teaching-Learning setting a novel prospect**

Sharmila Dutta\*, Dr. Arpana Singh\*\*

\*UGC- Senior Research Fellow, Diamond Harbour Women's University, Sarisha, South 24 parganas, West Bengal 743368, India. Email Id [sharmiladutta94@gmail.com](mailto:sharmiladutta94@gmail.com),

\*\* Assistant Professor, Diamond Harbour Women's University, Sarisha, South 24 parganas, West Bengal 743368, India. Email Id [arpanasinghh@gmail.com](mailto:arpanasinghh@gmail.com)

### **Abstract:**

The current technological era necessitates significant changes to the worldwide educational system, particularly the Indian one. After the COVID-19 pandemic transition era, basic pedagogy must give way to digital pedagogy. This digital pedagogy offers a fresh approach to ICT-based teaching and learning. Digital pedagogy refers to the use of modern technologies, such as cloud computing, multimedia, and others, to improve the educational experience or learning outcomes and give digital natives access to various advanced, flexible, and varied learning options. On the one hand, the current study explored the origins of digital pedagogy, how techno-pedagogical aspects can produce a hyper-globalized digital education system, and the connections between pedagogy, andragogy, and heutagogy. However, the teaching model based on digital pedagogy, the paradox of digital pedagogy, and the framework of digital pedagogy entering the new normal are also covered in this paper.

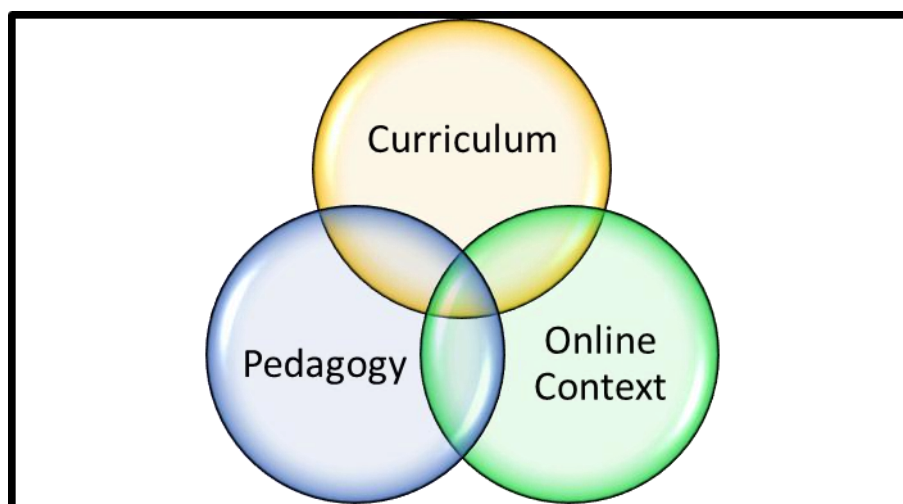
**Keywords:** *Andragogy, Digital Natives, Digital Pedagogy, Heutagogy, ICT.*

### **Introduction:**

Modern technology has been a blessing to the entire planet since before the 20th century. Technology advancements also enhance the teaching and learning process and the overall educational system. Over the past ten years, the K–12 educational system has been completely redesigned with the use of cutting-edge technology. A paradigm shift in the teaching and learning process is necessary to address the COVID-19 pandemic and move away from memorization in favour of developing 21st century's abilities. We must switch from traditional educational systems (such as the formal education system, in-person instruction, and chalk talk method) to more sophisticated digital ones (such as online learning, anytime-anywhere learning, m-learning, and virtual learning). Advanced communication systems and modern technology are employed.

Instead of addressing the global learning crisis, it aims to improve administrators' and instructors' technological proficiency and implement an actively learner-engaged learning system. Therefore, the employment of digital pedagogy and ICT-based teaching methodologies should be required in this transitional condition to maintain the educational system and improve the learning outcomes. The Greek words paidos and agogos, which translate as "leader of child," are the origin of the word pedagogy (Holmes & Abington-Cooper, 2000). Pedagogy is defined as the art of teaching, a scientific approach to comprehending the needs of each student, and appropriate practical knowledge of different teaching-learning techniques. This teaching strategy is only appropriate for in-person or formal education; it is not appropriate for remote learning or non-formal education. Because not all students are physically present in non-formal education systems, digital pedagogy has emerged. Online, hybrid, blended, and in-person learning environments can all benefit from the use of digital technologies in education. The five primary teaching approaches are as follows (1. Constructivism, 2. Collaborative, 3. Integrative, 4. Reflective, 5. Inquiry Based Learning). Constructivist theory is the foundation of digital pedagogy.

Diagram 1: Fundamental elements of Digital Pedagogy



The need for online and distance learning is growing in this digital age, and the use of digital pedagogy is becoming more and more common as a result of the fact that it enables teachers to use a variety of digital tools to teach (e.g., Immersive technology can be used in the classroom as a form of digital pedagogy). On the other side, digital pedagogy is crucial to producing digital natives and meeting the demands of the younger generation by offering a multifunctional digitalized educational system.

### **Objectives:**

The major objectives of this paper are:

1. To ascertain the PAH Continuum in teaching-learning environment;
2. To find out the historical perspective of digital pedagogy;
3. To highlight the Techno-Pedagogical aspect for hyper globalization;
4. To analyse the new application software for support, Revised Bloom's Taxonomy;
5. To discuss briefly the past, present, and future scenario of digital pedagogy through web technology;
6. To point out the paradox of digital pedagogy.

### **Research Questions:**

1. What is the PAH Continuum in teaching-learning environment?
2. What is the historical perspective of digital pedagogy?
3. Why is the Techno-Pedagogical aspect highlighting for hyper globalization?
4. What is the new application software for support, Revised Bloom's Taxonomy?
5. What is the past, present, and future scenario of digital pedagogy through web technology?
6. What are the paradoxes of digital pedagogy?

### **Methodology:**

The nature of this paper is mostly descriptive. Its sole source of data is secondary data. All of the information was gathered from a variety of sources, including journals, e-books, websites, reports from different organizations, and pieces that were published in local, national, and

international newspapers. A quick overview of the evolving landscape of digital pedagogy in the educational system will be provided in this presentation.

### **Historical Perspective of Digital Pedagogy :**

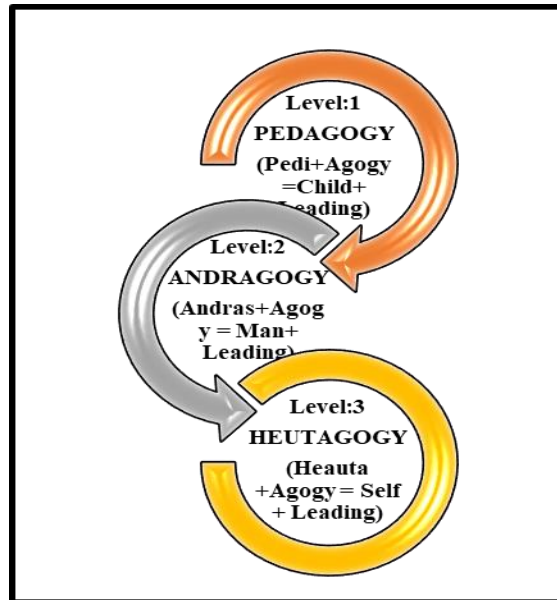
The Greek tradition of philosophical discourse, particularly the Socratic method of inquiry (470–399 BCE), was the first to propose the idea of teaching. Heinrich Pestalozzi in particular was regarded as the founder of modern teaching. The man credited with founding modern education is John Amos Comenius. Then, Paulo Reglus-Neves Freire, a Brazilian philosopher and educator, promoted the idea of critical pedagogy. The idea of digital pedagogy was developed in the early 20th century through distance learning, which was conducted through mail-delivered correspondence courses. Pedagogical concepts originated in European monasteries some thirteen centuries ago. It is the art and science of teaching children, according to Knowles (1973). Alexander Kapp first coined the term "andragogy" in 1833 to characterize Plato's method of instruction, which formalized Socratic concepts (Nottingham Andragogy Group, 1983). Andragogy is "the art and science of teaching adults," according to the Merriam Webster Dictionary Online (2014). Heutagogy is self-directed learning, whereas pedagogy is child-centered learning and andragogy is adult student-directed learning. Hase and Kenyon of Southern Cross University in Australia produced the seminal work on heutagogy in 2000. Compared to pedagogy and andragogy, heutagogy is a far more comprehensive approach. Students are taught how to acquire the abilities and skills through heutagogy.

The three pillars of transformational learning theory—psychological (shifts in self-perception), convictional (revision of belief systems), and behavioral (lifestyle changes)—are where the idea of digital pedagogy first emerged. A crisis in life causes Jack Mezirow, the creator of transformative learning theory (1978), to change his perspective due to a "disorienting dilemma." The metamorphosis refers to how learners modify their schemes (certain attitudes, beliefs, and emotional responses). This kind of education fosters independent thought.

Lastly, it is noticed that the approach of digital pedagogy comes out from the concept of TPACK model (technological pedagogical content knowledge, Mishra & Koehler, 2006). TPACK model mainly developed by three types of knowledge (1. CK for content knowledge, 2. PK for pedagogical knowledge, 3. TK for technological knowledge). Here technological pedagogical knowledge describes interaction between technological tools and specific pedagogical practices, while pedagogical content knowledge describes the relationship between

pedagogical practices and specific learning objectives, finally technological content knowledge tells the relationships among technologies and learning objectives.

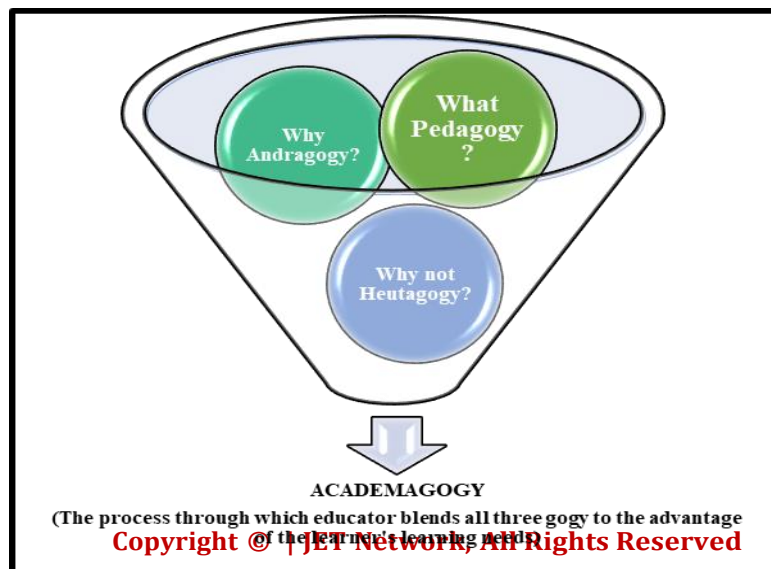
Diagram 2: PAH Continuum



### Techno-Pedagogical aspect for Hyper Globalization:

The three pillars of transformational learning theory—psychological (shifts in self-perception), convictional (revision of belief systems), and behavioral (lifestyle changes)—are where the idea of digital pedagogy first emerged. A crisis in life causes Jack Mezirow, the creator of transformative learning theory (1978), to change his perspective due to a "disorienting dilemma." The metamorphosis refers to how learners modify their schemes (certain attitudes, beliefs, and emotional responses). This kind of education fosters independent thought.

Diagram 3: Process in between Pedagogy-Andragogy -Heutagogy



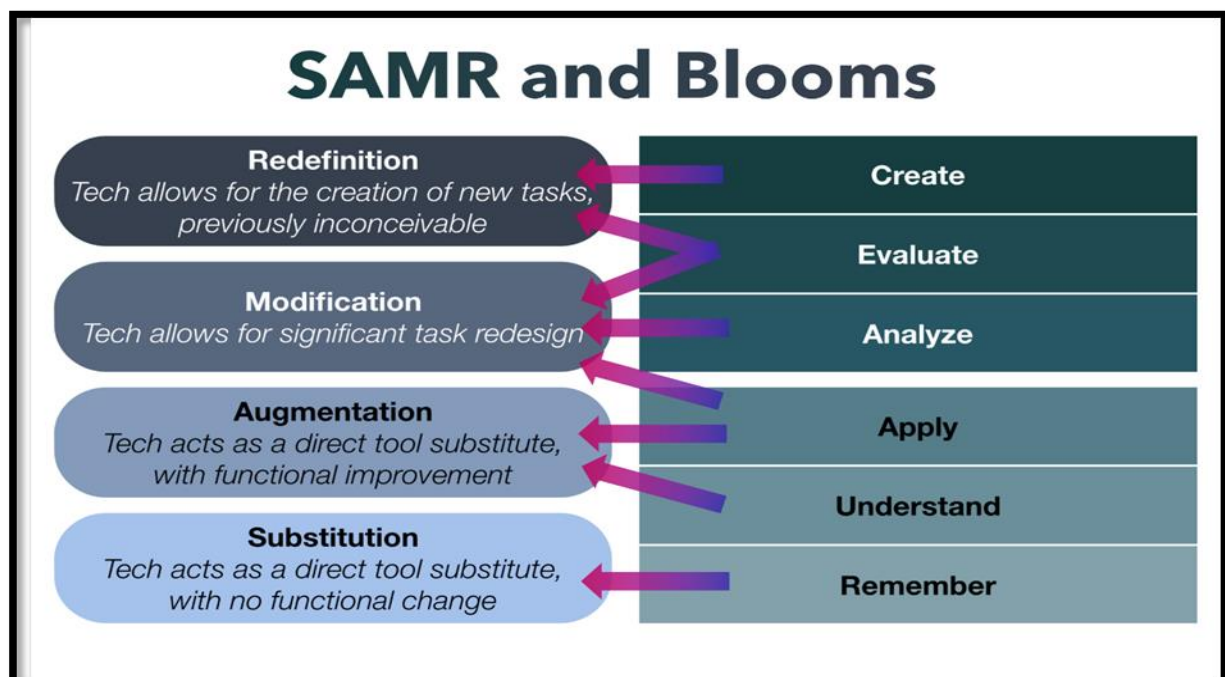
### Digital Pedagogy based Model:

The two primary frameworks listed below are available for use by teachers. Although these are not rigid technological models that we must adhere to, their concepts and ideas aid in the creation of effective learning experiences. We must consider how laptops will affect kids' learning when we begin implementing them in our classrooms. The SAMR+ and TPACK Models allow us to assess our technological integration efforts. The four stages of technology integration in the SAMR+ Model and how they impact the TPACK model. Both of these models have gained widespread acceptance and have been utilized recently to guide teachers in the incorporation of digital pedagogy.

#### ➤ SAMR Model

Dr. Ruben Puentedura pioneered the SAMR+ Model, which helps and enables educators to create, plan, and implement technology-based digital pedagogy. The teacher's primary goal is to create a basic ladder that connects the top and lower levels of SAMR+ to the upper and lower levels of Revised Bloom's Taxonomy.

Diagram 4: SAMR Model & Revised Bloom's Taxonomy





Source: <https://www.linkedin.com/pulse/student-engagement-educational-technology-samr-model-dr-sean-nufer/>

➤ TPACK Model

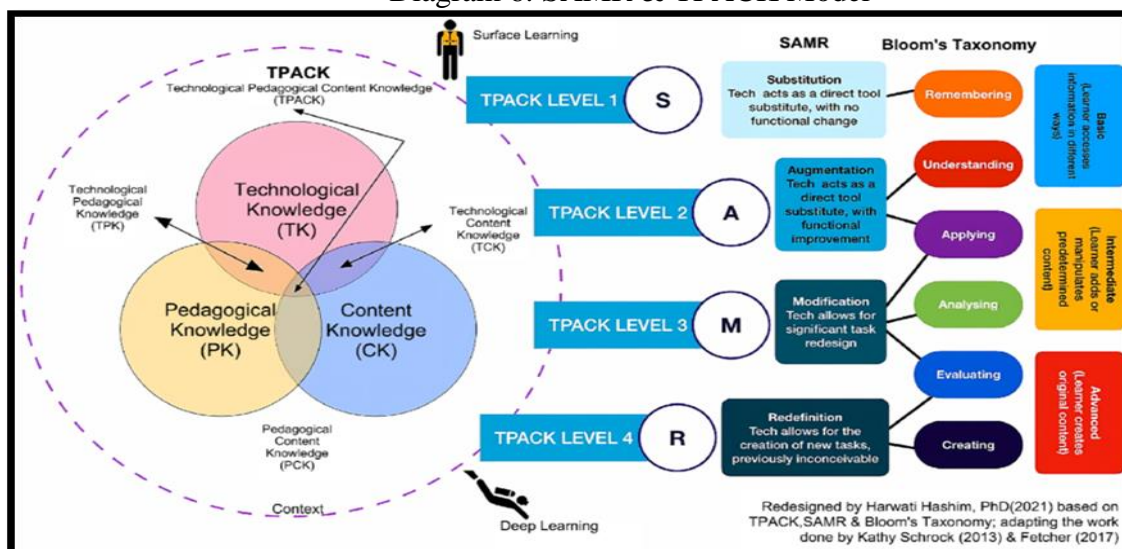
Technological Pedagogical and Content Knowledge, or TPACK, is a term coined by Mishra and Koehler (2006). Realizing how we can be excellent educators in a digital classroom is beneficial. The three primary knowledge domains of technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) are the emphasis of TPACK. TPACK's final output will vary from classroom to classroom based on the conditions of the students, the teachers, and the surroundings.

Diagram: 5 Dimension wise TPACK

TPACK Constructs	Definition	Example
TK	Knowledge about how to use ICT hardware and software and associated peripherals	Knowledge about how to use Web 2.0 tools (e.g., Wiki, Blogs, Facebook)
PK	Knowledge about the students' learning, instructional methods, different educational theories, and learning assessment to teach a subject matter without references towards content	Knowledge about how to use problem-based learning (PBL) in teaching
CK	Knowledge of the subject matter without consideration about teaching the subject matter	Knowledge about Science or Mathematics subjects
PCK	Knowledge of representing content knowledge and adopting pedagogical strategies to make the specific content/topic more understandable for the learners	Knowledge of using analogies to teach electricity (see Shulman, 1986)
TPK	Knowledge of the existence and specifications of various technologies to enable teaching approaches without reference towards subject matter	The notion of Webquest, KBC, using ICT as cognitive tools, computer-supported collaborative learning
TCK	Knowledge about how to use technology to represent/research and create the content in different ways without consideration about teaching	Knowledge about online dictionary, SPSS, subject specific ICT tools e.g. Geometer's Sketchpad, topic specific simulation
TPACK	Knowledge of using various technologies to teach and/represent and/ facilitate knowledge creation of specific subject content	Knowledge about how to use Wiki as an communication tool to enhance collaborative learning in social science

Source: [https://www.researchgate.net/figure/Definition-and-examples-of-TPACK-dimensions\\_tbl1\\_290044779](https://www.researchgate.net/figure/Definition-and-examples-of-TPACK-dimensions_tbl1_290044779)

Diagram 6: SAMR & TPACK Model



Source: [https://www.researchgate.net/figure/Combination-of-TPACK-SAMR-and-Blooms-Taxonomy\\_fig1\\_372692853](https://www.researchgate.net/figure/Combination-of-TPACK-SAMR-and-Blooms-Taxonomy_fig1_372692853)

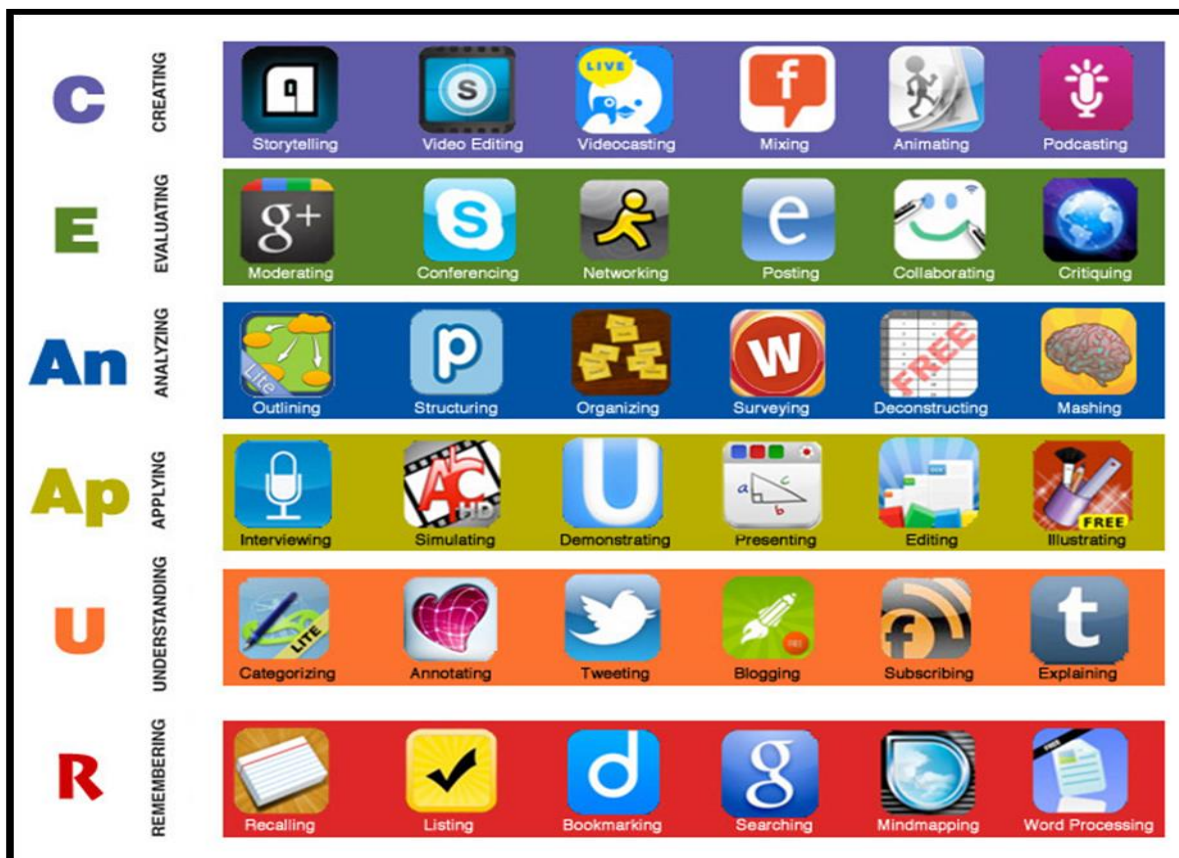
### New application software for support, Revised Bloom's Taxonomy:

Using technology-based digital tools, digital pedagogy boosts problem-solving, discovery learning, and student engagement. It may include open educational resources such as digital learning management systems, e-books, Massive Open Online Courses (MOOC), visual aids, and digital storytelling. There are many technologies available today to support digital pedagogy, but choosing the appropriate one can quickly become a daunting undertaking. In online, mixed, or traditional classroom settings, these tools can be utilized for evaluations, communication, and interaction among students and for creating and delivering information. They are as follows:

#### Tool Kits:

- Diigo: Social bookmarking tool for collaborative collection of bookmarks on a topic
- Dipity: Create a sharable visual timeline
- Express Scribe: Transcribing content from audio to text
- Tableau Public: Turn datasets into sharable visualization
- Voyant: Text analysis tool

Source: <https://theipadplayground.weebly.com/blooms-taxonomy.html>





Application Software:

- Blackboard Ally: digital content in an accessible format
- Blackboard Collaborate Ultra: Real-time meeting software that integrates learning management system
- Camtasia: Screen recorder and video editor
- H5P: Modify and reuse content of blackboard in at any time
- Kahoot: Game based learning platform
- Padlet: Transfer in-class to online activities and can brainstorming by posting to a virtual white board
- PeerScholar: Build transferable and metacognitive skills in the process of creating, revising and reviewing self and peer assignments
- Turnitin: Check grammar and providing feedback on the content authorship
- WeVu: Learners and instructors can comment in- line with a vedio which they made

WordPress: Content authoring, blogging

**Paradox of Digital Pedagogy:**

In the twenty-first century, education is a public utility. We now use digital mode to serve our educational approaches to stay up with the huge and diverse student body. This allows us to recognize the issues that students, teachers, and stakeholders face in light of the new digital pedagogy.

- Digital infrastructure, high-speed internet, and supporting devices such as desktop, laptop, tablet, or mobile phone are the essential elements needed to facilitate online learning. Even after the Right to Education was declared, these crucial components of online learning have further widened the access gap between the upper and middle classes and between rural and urban areas in terms of network accessibility.
- Skill training and digital material have always involved feedback and two-way conversation, which may not be possible in an online setting. Nonetheless, it is accomplished in labs and classrooms. Without actual laboratory experiments, it is hard to imagine pupils studying biology, physics, and chemistry.
- A significant portion of today's untrained human capital is emerging from online education. They will eventually enter the workforce, encounter employability issues, and require a considerable amount of time to become proficient and

integrate into the nation's high-yield workplace. Due to disparities, rural and underprivileged areas have struggled with a lack of digital infrastructure.

- The majority of conversations in a digital learning environment take place via chat, email, etc. The college environment isn't conducive to improving social contact. As a result, no social ties can develop between the instructor and the student.
- Even though many fake and unaccredited degrees are still offered online. These scammers damage employers' trust in online programs in addition to the legitimacy of online certificates.
- Some students desire the motivation to attend the in-person lesson. However, to complete the assignments and submit them on time, self-motivation and discipline are required in online classes. As a result, the dropout rate in online learning is extremely high.
- The vast majority of people in India, a multilingual nation, live in rural areas. The majority of online pedagogical courses offer English-language content. As a result, people who cannot speak English have difficulty accessing language content.
- One of the biggest challenges in rural areas is the maintenance and upgrade of digital equipment; few teachers have received formal training in digital technology. Government budgetary constraints are primarily to blame for this.

### **Digital Pedagogy stepping to a New Normal**

While the National Education Policy (NPE) 2020 seeks to digitally reform the education system in a push towards an Atmanirbhar Bharat, the UNESCO IITE served as the virtual platform for the 2020 Global Smart Education Conference with the theme "Artificial Intelligence and Future Education." Now is the right time to consider bridging the gap between digital pedagogy and web technology.

Table 1: Digital Pedagogy with Web Technology

Dimension	Pedagogy @1.0	Andragogy @2.0	Heautagogy @3.0
Learner Dependence	Dependent	Indenpendent	Interdependent
Learning resources	Teacher-driven and controlled	Learner and teacher controlled	Teacher and Learner provided
Learning Reasons	Gaining next level	Increasing performance	Learning potential unplanned, non-linear
Learning focus	Subject-centred	Problem-centred	Problem-oriented
Curriculum	Learn what society expects	Learn what they need to know	Redefine their learning needs as they learn
Motivation	External motivation	Internal motivation	Self-efficacy driven
Teaching role	Process-designer director	Collaborator	Capability-builder
Maturity of the Learner	Require significant guidance in the learning process	Bring real-world experience to learning	Highly mature in the learning process and experience
Applicability in online environment	Flipped classroom model	Well-suited for online environment	Formal online classroom is optional
Locus of control	Teacher	Teacher/Learner	Learner
Cognition Level	Cognitive	Metacognitive	Epistemic
Education Sector	Schools	Adult education	Doctoral Research
Knowledge production context	Subject understanding	Process negotiation	Knowledge creation
Learner S experience	Received	Formal and Informal	Lifelong
Learning Outcomes	Knowledge, grade	Competency	Capability

### Conclusion:

This study aimed to investigate the historical background of digital pedagogy, the significance of digital pedagogy in fostering digital citizenship, and the concept of the "digital global village." Since educators play a transformative role, all educators should be proficient in the use of digital pedagogy in their regular classroom instruction. Therefore, a shift in perspective and appropriate self-efficacy about technology are crucial in the twenty-first century, particularly in addressing the pressing issues of the day. Therefore, it is hoped that creating an

understanding web complex, hosting workshops, conferences, and training programs based on digital pedagogy for teachers will increase their interest in using ICT and digital pedagogy, raise their level of competency, and ultimately help them overcome all the challenges associated with teaching and learning with technology.

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