THE 19TH EDITION OF THE INTERNATIONAL CONFERENCE
EUROPEAN INTEGRATION
REALITIES AND PERSPECTIVES

Digital Pedagogy - The Model of Reconstruction of Training and Evaluation Strategies in Higher Education

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Abstract: In an era of continuous digitization, teachers turn to new technology to adapt to their students' universe and to be updated in this constant educational paradigm change. The article contributes to contextualizing the information, experiences, scientific knowledge, conditions, relationships, and meanings regarding the phrase "digital pedagogy" seen as a part of pedagogy, a component of education sciences. In this sense, the specificity of the field is given by the distinctive note that the digital component adds to didactic methods, the evaluation of school progress, contents, and learning conditions, as well as the extent to which it contributes to their efficiency.

Keywords: online training; digital teaching; digital content; open resources

1. Introduction

Digital pedagogy is an emerging field that integrates digital technologies into educational processes, transforming both teaching and learning methods.

Digital pedagogy focuses on integrating digital technologies in teaching and learning processes to improve the quality of education and adapt it to the needs and challenges of contemporary society. This involves using digital devices, platforms and applications, and online resources to facilitate access to knowledge, personalization of learning, and collaboration between students and teachers.

Digital pedagogy refers not only to the use of technology in education but also to the development of new pedagogical methods and strategies that harness the potential of these technologies to stimulate students' creativity, critical thinking, and autonomy. It proposes a dynamic, interactive, and flexible education model that responds to students' individual needs and prepares for a society increasingly dependent on digital skills.

Digital pedagogy can be challenging to define in just a few words. In his introduction to the MLA Digital Pedagogy Unconference (2013), Brian Croxall provides a broad definition of digital pedagogy: "Digital pedagogy is the use of electronic elements to enhance or change the experience of education.". Digital pedagogy is not only about using technologies for teaching but rather about approaching these tools

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from a critical pedagogical perspective. So, it is essential to use digital tools carefully. Still, it is even more important to decide when not to use them, especially how much attention you pay to the impact of digital tools on learning.

Digital pedagogy has been defined and operationalized in convergence with open pedagogy or open education.

Among the first theorists of digital open pedagogy, along with Gráinne Conole and her approaches that foreshadow new educational approaches in an "open world," Bronwyn Hegarty (2015) proposes a model with eight interrelated features for open pedagogy: (1) participatory technologies, (2) innovation and creativity, (3) sharing ideas and resources, (4) reflective practice, (5) people, openness and trust, (6) interconnected community, (7) learner-driven, (8) assessment collegiate.[1]
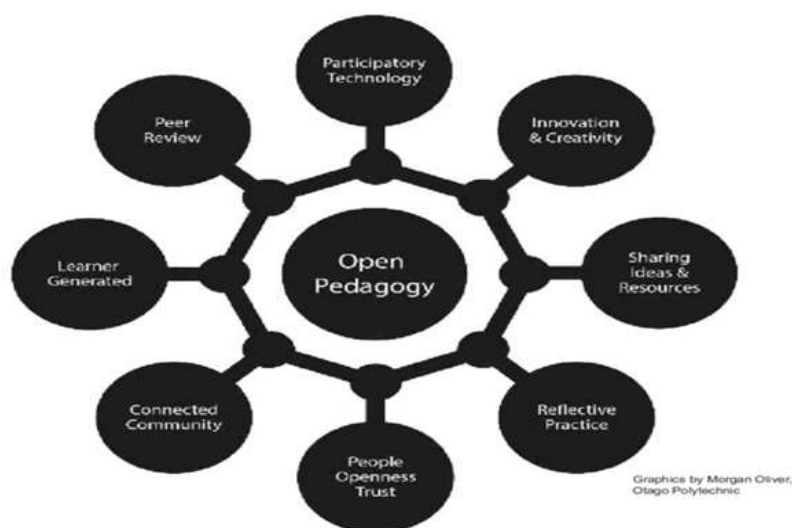

Figure 1. Attributes of Open Pedagogy.
Source: Hegarty, 2015

Digital pedagogy studies the design, development, and evaluation of educational situations with a significant component of digital technologies and the necessary conditions for their development. It mainly covers synchronous and asynchronous interactions in virtual and blended learning environments, learning management platforms and tools, digital educational resources, educational valences of various digital applications and tools, virtual assistants for learning and teaching, teachers' digital skills, academic policies, and specific programs (Istrate, 2022, pp. 3-10).

2. Preliminary Considerations

One of the main advantages of digital pedagogy is accessibility. Digital technologies allow access to educational resources from any corner of the world, regardless of physical location or socio-economic context. Online learning platforms, MOOCs (Massive Open Online Courses), and educational applications contribute to the democratization of education.

In a digital setting, the teacher is not just a provider of information but a facilitator of learning. They must guide, support, and inspire students, emphasizing the development of critical thinking and

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[1] https://educatia-digitala.ro/pedagogia-digitala-definitie-si-arie-conceptuala/.

problem-solving skills. Teaching becomes more personalized and interactive, supporting a student-centered learning process.

Digital technologies also allow the adaptation of didactic materials to the needs of each pupil or student. Artificial intelligence (AI)- based learning platforms can analyze users' learning pace and interests, providing them with personalized resources that respond to their skill level.

Communication technologies, such as collaboration platforms and educational social networks, allow better interaction between students, teachers, and colleagues. In the digital environment, geographical barriers do not limit collaboration, and exchanging ideas and knowledge becomes more fluid.

Digital platforms enable real-time assessment of student progress and provide immediate feedback. These adaptive assessments allow for dynamic course adjustments and rapid teacher interventions when difficulties arise.

Although digital pedagogy offers significant opportunities, it also presents challenges. Issues of digital inclusion, unequal access to technological resources, and the limited skills of some students or teachers in using new technologies need to be addressed. There is also the risk of depersonalizing education and decreasing direct human interaction.

Another essential aspect is the safety of personal data. As more and more educational platforms go online, teachers and students must be aware of data protection and the necessary security measures to prevent abuse or security breaches.

Both teachers and students must develop digital competencies to benefit from digital pedagogy fully. This involves continuous training and adaptation to new, rapidly evolving educational tools and technologies.

In digital pedagogy, teaching methods are adapted to effectively integrate digital technologies and facilitate learning in an interactive and personalized way.

3. The Most Relevant Teaching Methods Used in this Context:

Online collaborative learning

This method involves using collaboration platforms such as Google Classroom, Microsoft Teams, or other applications to allow students to work together regardless of their location. Teachers create group activities that stimulate the exchange of ideas and collaborative problem-solving.

Project-Based Learning (PBL)

Technology allows students to create complex projects using digital resources such as multimedia presentations, videos, blogs, or websites. Projects may include online research, the use of digital applications for design, programming, video editing, and real-time collaboration with peers.

Personalized learning

Digital platforms can adapt the content according to each student's pace and level. Through algorithms and artificial intelligence (AI), learning platforms can suggest additional resources, personalized exercises, or assignments based on student performance, creating an individualized learning process.

Gamification of learning

Gamification involves integrating game mechanics (e.g., points, medals, levels) into the learning process to motivate students. Educational platforms, such as Kahoot!, Quizizz, or Duolingo, use playful elements to make the learning process more engaging and interactive.

Flipped Classroom

In this method, students study the material at home using online resources (educational videos, podcasts, articles) and use classroom time to deepen knowledge through hands-on activities, discussions, or collaboration under teacher guidance. Access to digital materials and online learning platforms facilitates this model.

Simulation-based learning and virtual reality (VR)

Virtual reality technologies and simulations allow students to experience complex situations or concepts in a safe and interactive environment. For example, virtual laboratories or simulations of scientific phenomena will enable the exploration and understanding of abstract concepts through direct experimentation.

Webinars and online courses

Teachers can hold live or recorded classes via video conferencing (Zoom, Google Meet). This format allows access to global expertise, inviting experts from various fields or participating in international educational events.

Inquiry-based learning and digital exploration

Students are encouraged to conduct their research using digital resources, such as online databases, digital libraries, academic websites, and other virtual resources, to discover new knowledge and build critical understanding.

Learning through microlearning

Microlearning involves using short, focused learning modules that can be accessed quickly on mobile or desktop devices. Educational platforms offer short lessons, quick tests, or infographics that help students retain information more effectively, giving them a modular and flexible structure.

Online assessment and real-time feedback

Assessment in the digital environment allows students to test their knowledge and skills through online tests, quizzes, interactive projects, and digital assignments. Automated assessment tools provide immediate feedback, allowing for rapid teaching strategy or student learning path adjustment.

These teaching methods reflect how digital pedagogy can transform learning through technology, providing more varied and personalized opportunities for students and stimulating active engagement in the educational process.

An effective didactic method in higher education is online collaborative learning. This teaching method uses digital technologies to facilitate teamwork and collaboration between students, regardless of their physical location. It allows students to interact and collaborate in real-time or asynchronously, using digital platforms and communication tools, to solve problems, develop projects, and build knowledge together.

4. Features of Online Collaborative Learning

• Continuous interaction—Students can collaborate in real-time or asynchronously through online platforms such as Google Classroom, Microsoft Teams, Slack, or other educational applications. Communication can occur through text messages, video calls, document sharing, and multimedia resources.

• Diversity of resources—Online collaboration allows students to access and use a diverse range of digital resources (articles, videos, shared documents), facilitating the process of research and documentation. The resources are constantly updated, providing access to recent information.

• Roles and Responsibilities – Each team member can have a specific role within a project, thus stimulating the assumption of responsibilities and the development of team task management skills. Students are encouraged to share their ideas and collaborate towards common goals.

• Digital collaboration tools:

• Google Docs or Microsoft OneNote allows collaborative editing of documents in real-time.

• Trello or Asana are project management platforms that help teams track the progress of tasks.

• Padlet or Miro are used for brainstorming and organizing ideas visually.

• Real-time feedback – While collaborating online, students and teachers can provide instant feedback, facilitating continuous correction and improvement of work. This contributes to a dynamic and flexible learning process.

• Developing digital and social skills – Online collaboration helps develop technology skills and teaches students to communicate effectively, resolve conflict, and work together to achieve common goals. These skills are essential for the professional future in a digitized society.

5. Advantages of Online Collaborative Learning:

• Increased accessibility – Students can collaborate regardless of geographic location, reducing physical barriers and providing worldwide access to expertise and knowledge.

• Flexibility—Teamwork can take place at any time, as digital tools allow asynchronous collaboration without imposing strict synchronization on students' schedules.

• Active and engaging learning – Active involvement in problem-solving and project creation stimulates students' critical thinking, creativity, and motivation.

Challenges in online collaborative learning:

• Lack of face-to-face interaction—Online-only collaboration can diminish certain aspects of human interaction, such as nonverbal gestures and empathy.

• Uneven digital skills – Students or teachers with limited digital skills may have difficulty using collaborative platforms effectively.

• Time Management – In asynchronous collaborations, it can be challenging to synchronize activities or maintain a steady pace of teamwork.

Examples of online collaboration activities:

▪ Group projects on collaborative platforms

▪ Students can collaborate on a project using digital platforms such as Google Docs, Google Slides, Microsoft OneNote, or Microsoft Teams.

▪ Examples of projects include:

▪ Creating a research article or report – Students collaborate to write a research paper, sharing tasks (research, writing, editing) and contributing equally.

▪ Multimedia presentations—Teams can create interactive presentations on online platforms by adding text, images, videos, and graphics.

▪ Design projects—Students can collaborate on creating posters, infographics, or product prototypes using tools like Canva or Miro.

▪ Learning through online brainstorming

▪ Idea boards—Using apps like Padlet or Miro allows students to add ideas to a shared digital whiteboard, comment on, and develop their peers' ideas. This method can be used for project brainstorming, problem-solving, or generating creative ideas.

▪ Making collaborative videos

▪ Students can collaborate to create educational videos using apps like WeVideo or Animoto. *Examples of activities include:*

o Video Documentary—Teams of students can make a documentary about a topic of common interest, collaborating to write the script, shoot, and edit the video content.

o Video Tutorials – Students can create step-by-step tutorials to explain a concept or technical skill.

o Collaborative problem-solving

o Team Coding and Programming—Students can collaborate to create apps, websites, or games Using collaborative programming platforms like Repl—it or GitHub.

o Collaborative Mathematics: Students can solve math or physics problems together using interactive platforms like Desmos or GeoGebra, where they can build graphs and analyze data in real time.

o Collaborative reading journal

o Online Journals and Magazines—Using platforms like Blogger or Google Sites, students can collaborate on a reading journal or digital magazine, where everyone contributes book reviews, reflections, or opinion pieces.

o Virtual laboratories

o Team Science Experiments—Simulation platforms such as PhET or Labster allow students to collaborate to conduct virtual science experiments, analyze results together, and discuss observations.

o Gamification and online competitions

o Quizzes and competitions on gamification platforms – Educational platforms such as Kahoot!, Quizizz, or Socrative allows students to participate in interactive games and quizzes in teams or individually in friendly competitions to answer educational questions.

o Creating collaborative mind maps

o Mind mapping—Using apps like MindMeister or Coggle, students can collaborate to create mind maps that organize the key concepts and ideas of a topic, each contributing parts of the main theme.

These activities stimulate creativity, critical thinking, and collaboration skills, essential in modern digital education.

Online collaborative learning is, therefore, an essential element of digital pedagogy. It promotes teamwork, creativity, and the development of skills essential for students' digital future.

Assessment in digital pedagogy is a process adapted to the use of modern technologies. It aims to measure student progress and provide personalized and immediate feedback. Digital technologies bring new opportunities for assessment, enabling both traditional and innovative methods, such as automated, continuous, and formative assessment and personalized real-time feedback.

Types of assessment in digital pedagogy:

- Digital formative assessment

This assessment aims to provide continuous feedback and monitor student progress during learning. Online educational platforms (Google Classroom, Moodle, Edmodo) allow teachers to provide quick feedback through tests and quizzes and comments on assignments uploaded by students.

Examples: Online quizzes (Kahoot!, Quizizz), quick surveys (Mentimeter), and practical exercises on interactive platforms.

- Digital summative assessment

This type of assessment takes place at the end of a learning unit or a course and measures the level of knowledge and skills acquired by students. Digital platforms allow secure online exams or tests with automated feedback.

Examples: Online tests on platforms such as Google Forms or Microsoft Forms, exams on Moodle or Blackboard.

- Evaluation through digital projects

Students can be assessed on complex digital projects such as making a video, multimedia presentation, blog, or research paper. The assessment is based on clearly defined criteria such as creativity, synthesis, and presentation.

Examples: projects made on collaborative platforms (Google Slides, Canva, WeVideo) and digital portfolios (Google Sites, Seesaw).

- Self-assessment and peer assessment

Digital platforms allow students to self-assess using predefined rubrics or checklists. Peer review also allows students to provide feedback to each other, developing critical and collaborative skills.

Examples: Peer-to-peer assessments on platforms such as Peergrade or Turnitin and self-assessment through rubrics offered on learning management platforms (LMS).

- *Adaptive tests* use algorithms to adjust the difficulty of questions based on students' previous answers. This allows for a personalized assessment, depending on each student's level and progress.

Examples: Platforms that use adaptive assessment, such as IXL or DreamBox Learning, adjust content as the student progresses.

- *Evaluation through a digital portfolio*

Students can create digital portfolios to document their work over time. These portfolios allow teachers to assess student progress and provide feedback based on their continued development.

Examples: Digital portfolios on platforms like Google Sites, Seesaw, or Microsoft OneNote.

• *Assessment through simulations and virtual labs*

Digital simulations and virtual labs allow students to interact with complex concepts in science fields. Teachers can assess student performance in these online experiential activities.

Examples: Simulation platforms and virtual labs such as PhET, Labster, or Tinkercad for engineering.

• Evaluation through gamification

Gamification platforms, which integrate game elements into the learning process, allow students' progress to be assessed through scores, levels, and rewards. These assessments can be more attractive and motivating for students.

Examples: Assessment through gamified quizzes on Kahoot! or Quizizz, learning through educational games on Duolingo, Classcraft, or Minecraft Education.

6. Advantages of Digital Assessment:

o Immediate Feedback: Students quickly receive results and feedback on their performance, allowing them to correct errors and adjust their learning strategies.

o Customization: Adaptive tests and digital assessments can be customized to each student's pace and level.

o Accessibility and flexibility: Students can participate in assessments from any location, which provides greater flexibility in the learning schedule.

o Detailed progress analysis: Digital platforms provide detailed analysis and report on student progress, facilitating continuous and formative assessment.

o Time-Saving: Automated assessments, such as quiz marking, save time for both students and teachers.

o Challenges in digital assessment:

o Plagiarism and cheating: Online assessments can raise issues of plagiarism or test cheating, which is why additional security measures are needed, such as proctoring (digital proctoring) and anti-plagiarism software.

o Unequal access to technology: Students need access to quality devices or internet connections, which can create inequities in the assessment process.

o Depersonalization of assessment: Automated assessment can limit human interaction and in-depth understanding of student needs.

Assessment in the new context of digital pedagogy opens up new possibilities for effectively measuring students' knowledge and skills. It is flexible, fast, and personalized. However, careful integration is required to overcome the challenges associated with the technology.

7. Conclusion

Digital pedagogy redefines education, offering new learning, collaboration, and assessment methods adapted to the needs of an increasingly digitized society. It does not replace traditional pedagogy but complements it, emphasizing a personalized, flexible, and accessible education that prepares students for the challenges and opportunities of the digital age. However, to maximize the benefits of digital pedagogy, a balanced approach is needed where technology is used ethically, equitably, and effectively.

In conclusion, digital pedagogy redefines how education is offered and received, offering numerous opportunities for innovation and challenges that educational system actors must address to ensure effective, inclusive, and safe learning.

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