Digital Pedagogy. Definition and Conceptual Area

Olimpius Istrate

University of Bucharest, Faculty of Psychology and Education Sciences, Teacher Training Department
olimpius.istrate@unibuc.ro

Abstract: Is there a digital pedagogy, as a distinct domain, different from general pedagogy and from any other pedagogy? If so, what are the aims, object of study, specific methods and principles of digital pedagogy? **What is digital pedagogy** and how does it articulate with education sciences? These are the questions of the beginning stage of an emerging area within the education sciences, where practice challenges us to expand the existing body of knowledge corpus and pedagogical methods.

The article contributes to the contextualization of the set of information, experiences and scientific knowledge, conditions, relationships, meanings orbiting the phrase „digital pedagogy". The term itself has been used for over 10 years – the first dedicated articles being from 2011, with elements of digital proto-pedagogy in 2004: Latham, apud Fyfe – but absorbing a series of much older concepts and practices, sometimes in a new way.

Keywords: pedagogical innovation, digital pedagogy, digital technologies, education innovation, education sciences, innovative pedagogies, open pedagogy, theory of education

When we refer to digital pedagogy, we have in mind a wide range of concepts, educational situations, techniques, teaching methods and strategies, resources and contexts, tools and educational applications within the sphere of an area named in various interchangeable ways and subdivisions, such as training computer-assisted, computer-mediated education, technology-mediated pedagogy, virtual learning/ training environments, digital curriculum, distance education, e-learning, online learning/ online pedagogy, web-based learning, cyberpedagogy, multimedia pedagogy, OER-enabled pedagogy, electronically-enabled pedagogy, hybrid pedagogy.

The common point is one of the following conditions:

- the direct use of digital technologies for educational purposes – for example, for teaching, learning, assessment or for educational management;

- ensuring the premises to use digital technologies in education – for example, through programs for the purchase of equipment or through adaptation of the curriculum or through training programs for the development of digital skills; or

- considering their potential in an educational context – for example, in the development of an educational policy or in instructional design, in estimating the opportunity to use (or not use) a tool or a digital resource.

Digital pedagogy overlaps to a certain extent with the fields of study of other focused pedagogies: open pedagogy, critical pedagogy, interactive pedagogy.

A definition for digital pedagogy

A definition and circumscription of the digital pedagogy domain starts from a good knowledge of pedagogy. This is because digital pedagogy is and will remain a projection of pedagogy in the digital space. Also, the definition of digital pedagogy requires a good knowledge of the technological possibilities translated into concrete educational situations – the experience of the last years shows that only certain aspects of the use of digital technologies in education have authentic value and can add new pedagogical meanings.

A working definition for digital pedagogy is given by JISC: "We define digital pedagogy as the study of how digital technologies can be used to best effect in teaching and learning" (JISC, 2020/ 2021), a completion of an older short definition: "In simple terms, a digital pedagogy is the study of how to teach using digital technologies" (Howell, 2013). Various definitions in the specialized literature are centred (exclusively) on the practical aspect of teaching and/or learning, sometimes in relation to certain pedagogical currents or in contrast to certain aspects of "traditional" education. In analysing the praxeological and epistemological area covered by the term digital pedagogy, we notice that it is rather a pedagogy of digitalization of education or a pedagogy for the digital age than a *digital pedagogy*.

In our opinion, the exploration of digital pedagogy can only be done in the extension of pedagogy, as the science and art of education – practice has shown that the effectiveness of educational situations with a digital component is rather contextual, it comes in the conditions where it benefits from a good pedagogical design, is integrated in a mixed/hybrid pathway, uses digital and non-digital resources and tools.

Definition:

> *Digital pedagogy is the part of pedagogy that studies the design, implementation and evaluation of educational situations comprising a significant component of digital technologies, as well as the necessary conditions for their implementation – synchronous and asynchronous interactions in virtual and mixed learning environments, learning management platforms and tools, digital educational resources, educational usage of various digital applications and tools, virtual assistants for learning and teaching, digital competences of teachers, educational policies and specific programs.*

In essence, digital pedagogy deals with education – principles and legalities, characteristics, limits – and the specificity of the field is given by the distinctive note that the digital component adds to learning, teaching methods, assessment of learning, learning content, learning conditions, as well as the extent to which it contributes to their efficiency. In situations where a teaching, learning and/or assessment experience supported by digital technologies cannot be transposed into the "analogue environment" without altering its essence (the learning objectives and/or the didactic strategy), then we can speak of innovation exclusive to the field of study of digital pedagogy.

> *However, digital pedagogy is not a science of education, but a part of pedagogy, a component of the system of education sciences.*

Is there a digital pedagogy without computers? asked Paul Fyfe, from Florida State University, in 2011, in an attempt to circumscribe a digital pedagogy for the humanities. Today, we could imagine various other digital tools and applications, more or less miniaturized, as well as more variants of digital interfaces, which do not necessarily require physical contact. In any case, we cannot limit the understanding of digital pedagogy to the tools we use (Fyfe, 2011) or, we would add, to the way we use digital tools today.

> *Conceptualizing educational applications of new media is a prolific exercise for the broad field of educational sciences.*

The certainties and hypotheses, the subtleties, and nuances of the area of intersection between digital technologies and education can only be revealed in the field of pedagogy, by referring to the rigors of traditional pedagogy, in direct relation with open pedagogy and in the perspective of the proposals of innovative pedagogies.

Digital pedagogy – an open pedagogy

In general, digital pedagogy has been defined and operationalized in convergence with the open pedagogy or open education. Open education "successfully fits into the new paradigm defined by fluidity of roles, learner-centeredness, distributed resources, virtual facilities, and asynchronous lessons" (Istrate, 2000). A multitude of overlaps of the two conceptual areas show us the interdependence between the constructs; to a small extent we can talk about digital pedagogy without considering the *open* attribute; symmetrically, the proposals of an open pedagogy today have no substance without the new technologies, because life, in the social, cultural, personal, professional dimensions, is today largely mediated or supplemented by the tools of the new technologies. In fact, the development of open and collaborative web technologies has been a major contributor to the emergence of the open pedagogy 'movement' – that emerged nearly half a century earlier with the Leicester Model – offering new educational resources, techniques and specific teaching methods (Paskevicius & Irvine, 2019) and, we would add, open pedagogy, in turn, provided the right ideological framework, justifying to a good extent digital education and favouring it in practice.

Among the first theorists of a 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 technology , (2) innovation and creativity, (3) sharing ideas and resources, (4) reflective practice, (5) people, openness and trust, (6) connected community, (7) learner generated, (8) peer review.
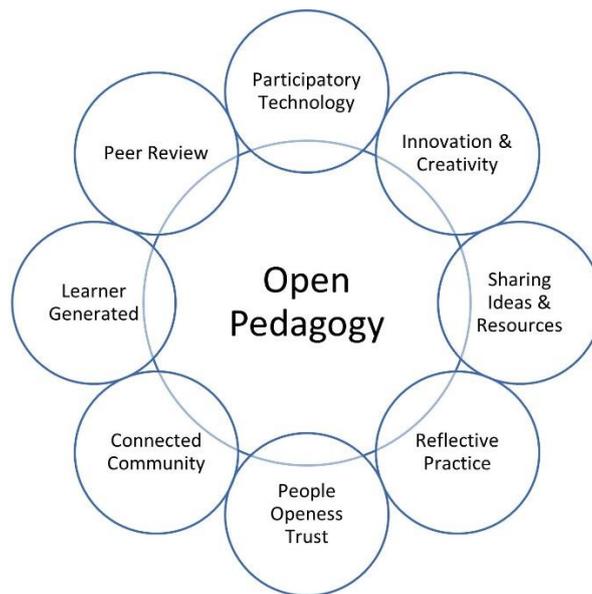

Fig. 1. Attributes of Open Pedagogy – Hegarty, 2015, based on Conole (2013)

Thus, digital pedagogy becomes "a method of empowerment" (Waddell & Clariza, 2018), by which learners are stimulated to take on the exploration of the world and of themselves. Anyway, when learning has conditions to overcome the classroom space and time, we are already talking about (premises for) a decentralization of educational authority (Boczar & Jordan, 2022). In the same rationale, the openness offered by digital education makes a major contribution to participation and civic engagement (through "critical digital literacy" – Polizzi, 2021), in a world where the social is increasingly intertwined with the digital, influencing the imaginaries of civic life, in a utopianism-dystopianism dialectic (ibid.) that can be shaped by education.

According to some authors, influenced by studies on MOOC-type initiatives in the area of adult education, open pedagogy can be considered a melange between design, algorithms and personalized adaptive technologies, on the one hand, and connections between learners, on the other hand, to make the learning process effective and participatory (Benneaser et al., 2016). In this perspective, most of the benchmarks of open pedagogy are anchored in

digital pedagogy: "Although technology […] is not unique to open pedagogy, sharing and open licensing of student artefacts generally involves use of digital technologies." (Clinton-Lisell, 2021).

In the new reality, the ecology of learning provides a mixed learning space, where multiple actors use a variety of tools, relationships and didactic approaches (Wals, 2020, apud Aroles and Küpers, 2022). According to the same author, in accordance with the new reality, the new pedagogy is:

- relational – showing deference to people, places and other species;
- critical – allowing (and encouraging) criticism and questioning;
- actional – pursuing change/ improvement;
- ethical – opening the way for ethical considerations and moral dilemmas;
- political – confrontational, challenging routines, systems and structures when it seems justified (p. 75).

So here is a significant revolution in the formulation of expectations from education, to which digital pedagogy has a major contribution, both in terms of defining implementation possibilities and in the pace of dissemination and integration in practice.

Digital pedagogy – an innovative pedagogy

Perhaps the most important contribution of thinking about digital pedagogy is actually bringing back pedagogy to a current trajectory, in a dynamic and effervescence to ensure its relevance, utility, value in the present times. The theoretical and practical progress of the field of educational science comes from the incorporation of surrounding influences and opportunities, closer (imperative) or more distant (wish-list), to which it gives a particular meaning and legitimacy. That is why, far from being on the periphery, digital pedagogy is today the cutting edge of pedagogical innovation, the main source of change in educational theory and practice.

Digital pedagogy is the cutting edge of pedagogical innovation.

„*So often in our discussions of online education and teaching with technology, we jump to a discussion of how or when to use technology without pausing to think about whether or why*" (Morris & Stommel apud Heidebrink-Bruno, 2014). The situation is indeed frequent, and the observation reminds of the need to connect to an authentic pedagogical core, as well as of the practiced habit of experienced teachers to look primarily at the potential outcome of the learning process, choosing methods and tools according to the most generous and efficient route possible. This is the digital pedagogical competence. It is built on a specific pedagogical culture, at the intersection between (classical) pedagogy and digital pedagogy, an area where the rules, principles, known theories are nuanced and recrystallized taking into account new contexts, a wealth of resources, different relationships and different possibilities for interaction between teacher(s) and students, between students, between students and the content of learning. In design, the decisions that give shape to a learning path **incorporate more and more unusual approaches**, in an endeavour of practical and theoretical reconfiguration, with new principles and strategies such as *gamification, empowerment education, flipped-classroom*, or with new purposes and ways of organization, in the perspective of integrating multimedia educational resources or artificial intelligence.

In fact, digital pedagogy brings a fresh vision of how to teach and learn, but also of what is taught. The new forms of organization of the learning path sometimes shed a different light on the learning contents, forced to adapt to other dimensions, benefiting from more efficient ways of traversing, interpreting and re-signifying, processing, practicing, internalizing, re-creating, co-creating. Digital technologies facilitate documentation, identification of problems and possible solutions, approach to real life, communication between those involved, structuring of the deconstruction and reconstruction process, contact with experts, finding resources, exposure of results and (public) validation of the approach. But the abundance of possibilities is both an opportunity to use multiple and enhanced elements in the didactic process, as well as a potential obstacle in focusing on relevant learning results and the efficient use of time – conventional pedagogical strategies and established algorithms must incorporate new aspects regarding the selection of relevant and scientifically validated contents, the reinterpretation of the expected learning outcomes, the transposition of work tasks in collaborative (remote) work contexts, ensuring access, techniques to motivate and involve all team members in learning activities, strategies to encourage independent learning, elements of digital security and student safety in the online environment. The vast and unstructured content publicly available in digital format reinforces the educators' role as facilitator, who has the task, on the one hand, of guiding students to valid sources of knowledge, relevant for the intended learning objectives, and on the other hand part of familiarizing them

with ways to identify, evaluate, discern between authentic knowledge/ valuable ideas and alternative sources, unrelated to the corpus of information and values in the widely accepted sphere.

> *Digital pedagogy brings more pedagogy into practice.*

Pedagogy is still a field in continuous innovation, as long as the current pedagogical knowledge constitutes a foundation for new hypotheses and theories, but mostly a tool to understand and appraise new educational practices. For example, in a *soft pedagogy* approach, brought to the fore by the great pedagogue John Dewey in 1916, digital tools and resources make today possible a form of *edutainment* and fuel a "pedagogy of discoveries", where interest for school subjects and for scientific fields it is awakened, induced, cultivated in students – a process of seduction necessary to reveal to students the relevance and meaning of what they are learning, so that they engage in learning and (passionately) discover knowledge, modes of action , values.

How might we reimagine analog teaching in terms of the digital? (Fyfe, 2011). This is the starting point, with various interpretive openings, from the transposition of education as such in the new environment, to the complete reformulation of learning paths.

In the attempt to do digital education, we start from elements that are known, tried, validated over time. Usually, we try to transpose conventional situations into the digital environment, using the same ways of organizing the group of learners, the same manner of interaction, the same teaching and assessment methods. In a first instance, what changes is the type of teaching material and the type of product of the activities – they are usually richer in multimedia elements – as well as the fact that some synchronous work sessions are remote, mediated by videoconferencing applications. A second phase aims at handling differently the time for teaching, learning and assessment, integrating asynchronous sessions and changing the conventional order or shifting the emphasis: for example, in the *flipped classroom*, independent learning precedes and partially substitutes teaching; also, formative assessment is more "natural" in the digital environment, it becomes to a greater extent a necessary tool and at the same time at hand, both for the teacher and for the learner.

> *In most cases, teachers are turning to new digital tools and resources to organize conventional teaching experiences. The innovation specific to digital pedagogy is where digital educational situations can no longer be transposed (back) into the analogue environment.*

We notice that we currently have no situations and learning paths that cannot be described by the concepts that precede the digital. Innovation is more about the form and not the essence, aiming to optimize, to make teaching and learning more efficient. Basically, we are still in the space of pedagogy, although it is true that the educational situations that we expect to carry out remotely (synchronously or asynchronously) or in *blended learning* format require sometimes a different design.

Digital pedagogy is pedagogy

Open education is not a new concept – the "open classroom approach", the *Leicestershire Model* or the *Informal Classroom* in the mid-twentieth century in Great Britain proposed an open didactic methodology that was gradually embraced in other education systems (J. Featherstone, 1967 , apud Mai, 1978). Also, distance (online) education and computer-assisted instruction do not come with novel approaches in terms of curriculum design or didactic model used, neither in general or in higher education (Blewett, 2016; Aroles and Küpers, 2022). The proposed innovations are gains at the level of the field as a whole, many of them being also taken up in conventionally organized classes (offline, unplugged or physically "face-to-face"). At least for now, the set of concepts, knowledge and methods of digital pedagogy are not distinct from a "conventional model" of understanding education. This is where a large part of the specialists in the field fall, with a view expressed synthetically as "the influence of technology should not be overrated", with the idea that technology is only a tool and must follow the instructional design field – what makes a learning activity effective are the psycho-pedagogical principles.

In a dialectic that has marked the last two decades, other specialists notice major changes in pedagogy determined by new technological models and practical possibilities not anticipated by theory, unfitting the existing theories – in other words, in this equation, "pedagogy should not be overestimated". Certainly, today, beyond open educational resources and virtual learning environments, we are dealing with new ways of approaching teaching and learning (Paskevicius and Irvine, 2019) – the influence of technology is major, every passing day. However, after waves of programs and

initiatives centred on equipment and connectivity, whose learning outcomes were not up to expectations, the trend has been to prioritize pedagogy, to put it "(back) where it belongs" – in a current expression: "*Zoom is not enough*".

The answer remains somewhere in the middle, subordinated to a dualist model rather than a segregationist one (Hofkirchner, 2021, p. 40-41). A transformation of pedagogy under the pressures of technology is often indicated: "*if you're using the same pedagogy with a stick and sand as you are using with a high-speed computer network, you really don't understand teaching and learning*" (Downes, 2011). Symmetrically, the technology brought to education must follow the basic rules of pedagogy: having and knowing how to use digital tools and resources does not necessarily mean that you (must) build effective educational situations with their help.

Is an attempt to demarcate pedagogy from digital pedagogy justified? A very good answer can be found in the journal Hybrid Pedagogy (2012): "*Digital Pedagogy is precisely not about using digital technologies for teaching and, rather, about approaching those tools from a critical pedagogical perspective. So, it is as much about using digital tools thoughtfully as it is about deciding when not to use digital tools, and about paying attention to the impact of digital tools on learning.*"

We can obviously talk about a step forward for the field of educational sciences as a whole. It is primarily an ideological phenomenon, part of our contemporary culture and the constantly evolving conditions in the professional and social areas, where expectations from a learning activity are marked by more pragmatism (*feedforward*), which changes relationships and didactic communication (*feedback*) in the sense of awareness of external variables related to roles and relative performance in society as a whole. Respect for otherness, inclusion, key competences and personal development (soft skills), transdisciplinarity, project-based approach, authentic assessment are projections in education of this contemporary ideology.

> *Digital technologies have proven their potential to open up education, to transform it, to show a plausible direction for "reinvention" on foundations not only technological but (rather) cultural, social, professional, economic, but mostly humanistic.*

The most important benefit of the effort to articulate a digital pedagogy consists in developing the capacity of the teachers to design, carry out and evaluate effective, useful educational situations adapted to the times and to the learners. In the European Union, the Digital Competence Framework for Educators (DigCompEdu) formulates the operational aspects of digital pedagogy, organized into 22 elementary pedagogical competencies organized into 6 areas (Redecker, 2017). Similarly, in the United States, digital pedagogy is one of the eight indicators in the National Standards for Quality Online Teaching (NSQ 2019), actually targeting the same "pre-digital" pedagogical concerns: communication, collaboration, interaction between learners, their motivation, individualization and personalization of learning paths, learning monitoring and assessment etc.

"*Teaching without digital technology is an irresponsible pedagogy*", said someone at the dawn of digital education (David Parry, 2009, apud Fyfe, 2011), and the meaning of this challenge launched at an early, enthusiastic stage, where technologies showed a lot of potential, is rather an invitation for educators to understand the advantages of new media in order to know when, how, if and why to integrate them into teaching practice. Equally, it can be a warning against unreasonable, limiting conservatism. The subsequent reformulation adequately reflects the concerns of contemporary educational theorists and practitioners: "*It is irresponsible to teach with technology without a digital pedagogy*" (Fyfe, 2011).

With or without the "digital" addition, pedagogy today incorporates the achievements and promises of technology, in hypothetical scientific extensions in the process of crystallization, sometimes implausible, often valuable, sometimes sterile. It is likely that, after a period of intense searches and rediscoveries, digital technologies will find a place, prominent of course, in an enriched pedagogy and based on new frameworks, in chapters dedicated to teaching methods, external conditions of learning, learning climate, classroom management and others, and in certain situations the education will be digital in a natural way, in a *sine qua non* cohabitation.

> *Attempts to limit education to "conventional" spaces and frameworks, in what is called "traditional" education, are a refuge for an anachronistic, reductionist, reality-impassive pedagogy.*

Between "traditional" pedagogy and "innovative" pedagogies is a biunivocal relation. As the new didactic approach models and the use of technological resources in education fuel the new pedagogy, theories validated by practice, over time, should be the starting point for new pedagogical hypotheses, and ensure a theoretically valid construction. We need to pay more attention to the value of authentic pedagogy for today's everyday practice.

> *The digital environment has created new spaces and horizons for education. And education is the object of study of pedagogy.*

We still need to explore how technology, open access and the school without walls are changing the way we can do education, as well as the long-term effects of this education for the individual, communities, society. We still have to justify and prepare the transition to a new stage, in which education policy makers, decision-makers, teachers, parents understand, accept and promote or demand new, adapted ways of working, which incorporate to a significant extent digital technologies and open education.

However, whether we call it digital, multimedia, remote, innovative, interactive, it is *pedagogy* – a lively, open to new, transformative and, above all, useful pedagogy.

Bibliography

* * * (2012) What is Digital Pedagogy? *Hybrid Pedagogy*, https://hybridpedagogy.org/tag/what-is-digital-pedagogy/

Aroles, J., & Küpers, W. (2022). Towards an integral pedagogy in the age of 'digital Gestell': Moving between embodied co-presence and telepresence in learning and teaching practices. *Management Learning, 53(5)*, 757–775. https://doi.org/10.1177/13505076211053871

Benneaser, J. et alii (2016). Design of Open Content Social Learning That Increases Learning Efficiency and Engagement Based on Open Pedagogy. *Turkish Online Journal of Educational Technology – TOJET*, v15 n1 p20-32 Jan 2016. Online: https://eric.ed.gov/?id=EJ1086219

Blewett, C. (2016). From traditional pedagogy to digital pedagogy: Paradoxes, affordances, and approaches. In: M.A. Samuel, R. Dhunpath, and N. Amin (Eds). *Disrupting Higher Education Curriculum*. Leiden, The Netherlands: Brill.

Boczar, A., & Jordan, S. (2022). Continuity during COVID: Critical digital pedagogy and special collections virtual instruction. *IFLA Journal, 48(1), 99–111*. https://doi.org/10.1177/03400352211023795

Clinton-Lisell, Virginia (2021). Open Pedagogy: A Systematic Review of Empirical Findings. *Journal of Learning for Development*; Vol 8; No 2. Online: http://oasis.col.org/handle/11599/3895

Dewey, J. (1916/ 2001). Democracy and education. An introduction to the philosophy of education. University Park, PA: The Pennsylvania State University. Online: https://www.gutenberg.org/files/852/852-h/852-h.htm

Downes, S. (2011) Why isn't it about the pedagogy? [WWW] Online: http://www.downes.ca/post/54552 , accessed May 2016

Fyfe, P. (2011). Digital Pedagogy Unplugged. *Digital Humanities Quarterly, Volume 5, Number 3*. Florida State University. https://www.digitalhumanities.org/dhq/vol/5/3/000106/000106.html

Hegarty, B. (2015). Attributes of Open Pedagogy: A Model for Using Open Educational Resources. *Educational Technology, 55(4)*, 3-13. Retrieved August 2, 2021, from http://www.jstor.org/stable/44430383

Heidebrink-Bruno, A. (2014). A Pedagogy of Discovery: Reflections on Teaching Tech to Elementary Students. *Hybrid Pedagogy*. https://hybridpedagogy.org/pedagogy-discovery-reflections-teaching-tech-elementary-students/ Visited Dec. 2022

Hofkirchner, W. (2021). Digital Humanism: Epistemological, Ontological and Praxiological Foundations. In P. Verdegem (Ed.), *AI for Everyone?: Critical Perspectives* (pp. 33–48). London: University of Westminster Press. https://doi.org/10.16997/book55.c

Howell, J. (2013). Teaching with ICT. Digital Pedagogies for Collaboration and Creativity. South Melbourne: Oxford University Press.

Istrate, O. (2000). Educația la distanță. Proiectarea materialelor. Botoșani: Editura Agata. Online: agata.ro/olimpius-istrate-educatia-la-distanta-proiectarea-materialelor

Jaekel, A.-K., Scheiter, K., & Göllner, R. (2021). Distance Teaching During the COVID-19 Crisis: Social Connectedness Matters Most for Teaching Quality and Students' Learning. *AERA Open, 7*. https://doi.org/10.1177/23328584211052050

JISC (2020/2021) Digital Pedagogy Toolkit. Helping academics to make informed choices when embedding digital into the curriculum. https://www.jisc.ac.uk/guides/digital-pedagogy-toolkit

Kukulska-Hulme, A., Bossu, C., Charitonos, K., Coughlan, T., Ferguson, R., FitzGerald, E., Gaved, M., Guitert, M., Herodotou, C., Maina, M., Prieto-Blázquez, J., Rienties, B., Sangrà, A., Sargent, J., Scanlon, E., Whitelock, D. (2022). Innovating Pedagogy 2022: Open University Innovation Report 10. Milton Keynes: The Open University

Latham, S. (2004). New Age Scholarship: The Work of Criticism in the Age of Digital Reproduction. *New Literary History, 35*, 411 – 426. https://doi.org/10.1353/nlh.2004.0043

Mai, R. P. (1978). Open education: From ideology to orthodoxy. *Peabody Journal of Education, 55*(3), 231-237. doi:10.1080/01619567809538192

Niemi, H. (2021). AI in learning: Preparing grounds for future learning. *Journal of Pacific Rim Psychology, 15*. https://doi.org/10.1177/18344909211038105

NSQ National Standards for Quality. (2019). Quality online teaching. Third Edition. The Virtual Learning Leadership Alliance (VLLA) and Quality Matters (QM).

Paskevicius, Michael; Irvine, Valerie (2019). Open Education and Learning Design: Open Pedagogy in Praxis. *Journal of Interactive Media in Education, v2019 n1* Article 10 2019. https://eric.ed.gov/?id=EJ1228587

Polizzi, G. (2021). Internet users' utopian/dystopian imaginaries of society in the digital age: Theorizing critical digital literacy and civic engagement. *New Media & Society, 0*(0). https://doi.org/10.1177/14614448211018609

Redecker, C. (2017). European Framework for the Digital Competence of Educators: DigCompEdu. Punie, Y. (ed). EUR 28775 EN. Luxembourg: Publications Office of the European Union. https://doi.org/10.2760/159770

Sampson, D., Ifenthaler, D., Spector, J.M., Isaias, P. (eds.) (2014). Digital Systems for Open Access to Formal and Informal Learning. Springer International Publishing Switzerland. https://doi.org/10.1007/978-3-319-02264-2

Strommel, J. (2014). Critical Digital Pedagogy: a Definition. *Critical Digital Pedagogy/ Hybrid Pedagogy*. https://hybridpedagogy.org/critical-digital-pedagogy-definition/

Väätäjä, J. O., & Ruokamo, H. (2021). Conceptualizing dimensions and a model for digital pedagogy. *Journal of Pacific Rim Psychology, 15,* 1–12. https://doi.org/10.1177/1834490921995395

Waddell M., Clariza E. (2018). Critical digital pedagogy and cultural sensitivity in the library classroom. *College and Research Libraries News* 79(5): 228–233. https://doi.org/10.5860/crln.79.5.228

Wiley, David; Hilton, John Levi III (2018). Defining OER-Enabled Pedagogy. *International Review of Research in Open and Distributed Learning*, Volume 19, Issue 4, Septembre 2018. https://doi.org/10.19173/irrodl.v19i4.3601