



ENID-TEACH

www.enidteach.eu

**A GUIDE TO GOOD PRACTICES
IN FLEXIBLE DIGITAL PEDAGOGIES**

**Coordination: Savoir Devenir
Edition: Divina Frau-Meigs**



**Co-funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

TABLE OF CONTENT

INTRODUCTION Sonia Santoveña-Casal Universidad Nacional de Educación a Distancia (UNED) – Spain Project coordination	3
NOOC CONNECTED and CRITICAL METHODOLOGIES Divina Frau Meigs, Irma Velez and Adeline Bossu Savoir Devenir – France	4-7
NOOC COLLABORATIVE LEARNING AND RESEARCH METHODOLOGY Renata Gambino, Federica Abramo, Francesca Vigo, Salvatore Ciancitto University of Catania – Italy	8-11
NOOC ACTIVE AND GAMIFIED LEARNING Lina Morgado, Ana Afonso, António Quintas-Mendes, Filipe Penicheiro Universidade Aberta – Portugal	12-15
NOOC INVERTED METHODOLOGIES Mariya Monova-Zheleva, Yanislav Zhelev Burgaski Svoboden Universitet (Burgas Free University) – Bulgaria	16-19
NOOC DESIGN OF FLEXIBLE LEARNING DIGITAL PROGRAMS Sonia Santoveña-Casal, Rubén Gómez Méndez, M ^a Jesús Roldán Roldán, Eduardo López Bertomeo, Irene Méndez Sánchez Universidad Nacional de Educación a Distancia (UNED) – Spain	20-23
EMERGING TRENDS: Sustainability and Accessibility of OERs and Artificial Intelligence in Education Dario Assante MAG UNINETTUNO srl – Italy	24-25
CONCLUSION Sonia Santoveña-Casal, Divina Frau-Meigs, Lina Morgado	26-27

INTRODUCTION

ENID-Teach Project coordination

The 'Guide to good practices in flexible digital pedagogies' has been developed in the framework of the project European Network in D-Flexible Teaching (ENID-Teach), KA220-HED - Cooperation Partnerships in Higher Education, 2021-1-ES01-KA220-HED-000027551. This project has been coordinated from the Faculty of Education of the Universidad Nacional de Educación a Distancia (UNED) (Spain), with the essential support, supervision and advice of the Vice-Rectorate for Internationalisation and Multilingualism of this institution.

The COVID-19 crisis, between 2019 and 2023 (according to the World Health Organization), imposed different degrees of social isolation according to the evolution of the pandemic, which in turn brought about the need to adapt the education system and university learning processes to a digital model.

During that period, academic institutions responded to the urgency of the situation by taking decisions without a clear definition of the type of distance or blended learning model to be implemented. This resulted in the adoption of interim measures and adjustments that, in many cases, attempted to replicate the face-to-face model using digital environments, but without a sound or coherent pedagogical design.

Not surprisingly, at this juncture, institutions faced constraints in providing a structured and sustainable response. Among the main factors contributing to this difficulty was the insufficient training of teachers in digital skills and flexible pedagogical methodologies needed to meet the challenges of this new reality.

In this context, the European Network in D-Flexible Teaching (ENID-Teach) project was created as a response to the COVID-19 crisis, although its applicability transcends the pandemic situation. The ENID-Teach consortium members consider it essential to overcome the 'doing for the sake of doing digital' approach, which often generates the reversal of the proverbial "old wine in new wineskins".

The first objective of the ENID-Teach project is to strengthen the competences of university teaching staff in methodologies that enable them to adapt their online teaching and learning practices to the diverse profiles and needs of their student body. This purpose is approached from a time-efficient perspective, promoting a progressive training, oriented to the development of strategies and methodologies that foster flexible, distributed and digital learning.

The second objective of the project is to encourage the active participation of university professors and teachers in the construction of a distributed and cohesive cooperation network. The main purpose of this network is to facilitate the exchange of good practices, as well as to promote digital transformation in the university environment.

Both objectives have been successfully achieved.

On the one hand, ReColn-TaD, 'the International cooperation network for knowledge transfer and digital learning in the face of the post-COVID crisis', currently has more than 500 members. On the other hand, digital training has been provided to university teachers, focusing on flexible digital pedagogical practices, such as connected, critical, collaborative, investigative, active and flipped methodologies, as well as offering training for the design of flexible digital learning programmes.

To achieve this last objective, a methodology based on microlearning was used, through microlessons and Nano Open Online Courses (NOOCs), and a distributed pedagogical model. The microlearning programme is structured in micro-lessons or learning nuggets, offered in multiple formats. The content is organised in small modules to facilitate agile and efficient learning. The interconnection between the content fosters the acquisition of digital competences in a dynamic way, interweaving theory and practice with self-assessment activities, discussions and a final assessment, in a variety of interactive formats.

Five NOOCs (Nano Open, Massive and Online Courses) have been developed in five languages, offered in several editions. Each NOOC lasts 25 hours (approximately one week) and covers the main methodologies related to flexible learning. All courses are available under a Creative Commons licence, which guarantees that all their contents, including interactive Open Educational Resources (OERs), can be used and reused for training purposes, always respecting the terms of the licence.

Finally, the ENID-Teach Project Coordination would like to express its sincere thanks to the Vice-Rectorate for Internationalisation and Multilingualism, whose support has been essential for the realisation of this project. We would also like to thank all the researchers, academics, members of the ReColn-TaD network and especially the project partners, whose work and collaboration throughout the three years of the project have contributed significantly to the development and success of this project.

NOOC CONNECTED and CRITICAL METHODOLOGIES

Savoir Devenir

Main concepts

The NOOC Connected and Critical Methodologies (CCM) aims at introducing participants to the interpersonal and critical use of digital tools and social networks in educational scenarios. It relies on design learning and project-based learning, and its attendant competences such as communication and collaboration.

The NOOC focuses on connectivism as a method that favours the acquisition of knowledge and the appropriation of diversified pedagogical practices through digital connections and interactions (Siemens, 2005; Downes, 2010). Technology is used to produce interactive resources that help to connect distant actors (in time, space and culture) to each other and to non-human agents (software, databases, applications, etc.).

These interactions within multiple systems of meaning imply to follow the principles of connectivism (Siemens, 2005):

- Encourage exchanges with a diversity of opinions and resources
- Create contacts with experts or specialised information sources
- Use non-human processes (e.g. databases containing specific knowledge management)
- Help to identify future knowledge needs to implement the right strategies, activate the right levers
- Support the development and sustainability of contacts for lifelong learning, including through social networks
- Develop the ability to make connections between areas of knowledge, ideas and concepts
- Emphasise the importance of the value of knowledge sources, their relevance and validity
- Facilitate decision-making while raising awareness to the relevance and timeliness of the information used and its context.

Throughout the process, these interactions and principles can foster the “epistemic maturity” of learners, defined as a reflective and distanced overview on the learning processes (Frau-Meigs and Bossu, 2016). Epistemic maturity posits that peer-to-peer interaction, particularly through social media, changes not the nature of knowledge but the circuits of validation and recommendation of content (Serres, 2012).

However, in this context of highly connected learning, disinformation threatens the circuits of validation and recommendation of scientific content and creates distrust instead of fostering the trust that is needed for interactive learning (Frau-Meigs 2019). Learners need to be trained to use social networks and online communities with increased vigilance, so that they assess the value of their resources and choose them for their relevance and validity, while being wary of their own cognitive biases (Pasquinelli and Broner, 2021).

Consequently, NOOC CCM recombines connected learning with critical thinking, defined as “the ability to calibrate correctly one's confidence in information, through a process of evaluating the epistemic quality of that information, in order to make a decision” (Eduscol, 2021).

The development of critical thinking is based on the four essential relationships, with their attendant competences, related to information and its uses in academic disciplines:

- The relationship to learners (trust, empathy...)
- The relationship to content (epistemology and quality scientific information)
- The relationship to technology and media (control of the choice of resources and awareness of the way information is produced and shared on social media)
- The relationship to the brain (cognitive biases, fact vs opinion...)

Pedagogical scenarios and strategies

The repertoire of pedagogical strategies in connectivist and critical learning involves reducing the use of the transmissive mode (lectures, tutorials) and offering student-centred projects. The challenge is to engage learners as co-actors in their learning, using human and digital tools to carry out their projects. They can create content and cooperate with others on a task, which ultimately leads to their empowerment.

These strategies involve:

- Choosing a student-centred topic (after discussion with the learner)
- Focusing on the authenticity of the experience (yours, the learners, ...)
- Mobilising several connectivist and critical thinking principles and competences and making them explicit to gain support
- Evaluating the sources of information to ensure the integrity of the knowledge acquired

NOOC CCM invites teachers to gauge these strategies and weave them with their pedagogical posture, adopting several degrees of freedom, without being locked in a single one, due to the rapid changes in content and format fostered by technological tools increasingly driven by AI-Systems. Connected and Critical postures encourage teachers to be “EX-centred”, that is to say to depart from a top-down approach and to place their relation to the student at the centre of the pedagogical situation:

- The Ex-ploratory posture suggests the need to update one's knowledge and exercises one's curiosity to inform and train oneself
- The Ex-ercised posture suggests a certain epistemic maturity and makes more frequent use of digital technology in its practice
- The Ex-perimented posture suggests full awareness of the evolutionary dimension of online resources and content and is open to inter-creativity.

Connected and Critical Resources

Digital resources have been enriched by connectivity. Their evolution has become more complex as the number of possible functionalities has increased:

- Simple content repositories, close to pre-digital media such as paper or film (such as pdf or ppt deposited on a course platform for example)
- Content associated with intelligent tools (such as online databases or social sharing networks)
- Aggregation of contents, tools and services that offer numerous opportunities for collaboration and knowledge production (such as wikis or collaborative websites).

These resources can be coupled with the choice of pedagogical postures:

- In the Ex-ploratory posture, it is possible to use resources that have already been designed, put online by colleagues or experts, like an interactive PDF. This is an effective form of “recycling”, giving access to content in a non-synchronous way.
- In the Ex-ercised posture, it is possible to look for OERs to adapt to a new course. It is a form of “reallocation”, that gives value to work done by others and takes advantage of recommendations on social networks.
- In the Ex-perimented posture, it is necessary to create resources because nothing that exists corresponds to expectations. A serious game or a MOOC on critical thinking or disinformation could be an example. It is a form of “inter-creativity”, that can bring into the course the advantages of complex immersive and interactive devices.

NOOC CCM posits that there are four main selection criteria to keep in mind, which are linked to the four essential relationships of critical thinking:

- Pedagogical criteria: relationship with the brain (link to discipline, learner autonomy...)
- Technical criteria: relationship to technology (ergonomics, connectivity, mobility...)
- Economic and legal criteria: relationship to the learners (data protection, copyright, ethics...)
- Editorial criteria: relationship to content (validity of sources, possibility of modifying and sharing, multimodality, interactivity ...)

References

- Albero, B. et Charignon, P. (2018). [La e-pédagogie à l'université : Moderniser l'enseignement ou enseigner autrement](#). AMUE.
- Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C.A., & Persson, T. (2015). [Strategies for teaching students to think critically: A meta-analysis](#). Review of Educational Research. Vol. 85 2, pp. 275-314.
<https://journals.sagepub.com/doi/10.3102/0034654314551063>.
- Anderson, W. (2021). [The model crisis, or how to have critical promiscuity in the time of Covid-19](#). Social Studies of Science. Vol.51 2. <https://doi.org/10.1177/0306312721996053>.
- Dabbagh, N and Kitsantas, A (2012). [Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning](#). Internet and Higher Education. Vol. 15 3–8. <https://doi.org/10.1016/j.iheduc.2011.06.002>.
- Downes, S (2010). Learning Networks and Connective Knowledge, in Yang and Yuen (eds) [Collective Intelligence and E-Learning 2.0: Implications of Web-Based Communities and Networking](#) DOI: 10.4018/978-1-60566-729-4
- Eduscol (2021). [Former l'esprit critique des élèves](#). Ministère de l'éducation nationale.
- Frau-Meigs, D. et Bossu, A. (2018). [La maturité épistémique dans les MOOC: le cas du MOOC Pas à Pas du projet européen ECO](#). Revue française des Sciences de l'information-communication. Vol. 12. <https://doi.org/10.4000/rfsic.3366>
- Frau-Meigs, D. and Bossu, A. (2016). [The ECO project of e-teaching: social MOOCs at the crossroads of actors' cognitive logics and strategies](#). EDEN ONLINE.
- Goupil, L., & Kouider, S. (2019). [Developing a Reflective Mind: From Core Metacognition to Explicit Self-Reflection](#). Current Directions in Psychological Science, Vol. 28 4.
<https://journals.sagepub.com/doi/10.1177/0963721419848672>
- Pasquinelli, E. et Bronner, G (2021). [Eduquer à l'esprit critique. Bases théoriques et indications pratiques pour l'enseignement et la formation](#). Conseil scientifique de l'éducation nationale.
- Peraya, D. et Cerisier, J-F. (2022). [Concevoir aujourd'hui des formations hybrides ou à distance](#). IH2EF.
- Pozo, J-I, Perez Echeverria, M-P., Cabellos, B. and Sanchez, D.L. (2021). [Teaching and Learning in Times of COVID-19: Uses of Digital Technologies During School Lockdown](#). Psychol., Sec. Educational Psychology. Volume 12. <https://doi.org/10.3389/fpsyg.2021.656776>
- Purvis, A.J, Rodger H.M., and Beckingham S. (2020). [Experiences and perspectives of social media in learning and teaching in higher education](#). International Journal of Educational Research Open. Vol.1. <https://doi.org/10.1016/j.ijedro.2020.100018>.
- Rapanta, C., Botturi, L., Goodyear, P. et al (2021). [Balancing Technology, Pedagogy and the New Normal: Post-pandemic Challenges for Higher Education](#). Postdigit Sci Educ. Vol. 3, pp. 715–742. <https://doi.org/10.1007/s42438-021-00249-1>.
- Serres, A. (2012). Dans le labyrinthe : Evaluer l'information sur Internet. C&F Editions.
- Siemens, G. (2005). [Connectivism: A Learning Theory for the Digital Age](#). Instructional technology and distance learning. Vol

Open Educational Resources

NOOC CCM provides examples of resources and tools to make courses dynamic, interactive and animated, such as, inter alia, [Genial.ly](#), Synthesia, [Canva](#), H5P, Thinglink, Padlet, Answer Garden and Calameo.

<p><u>General Introduction</u></p>  <p>Introduction Language: English, with subtitles</p>	<p><u>About connectivism</u></p>  <p>The Connectivism Language: English, with subtitles</p>
<p><u>Overview of Connectivism</u></p>  <p>Overview of Connectivism Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Learning models</u></p>  <p>Learning models Languages: English, French, Italian, Portuguese, Spanish</p>
<p><u>The actors and their logics</u></p>  <p>The actors and their logics Language: English, with subtitles</p>	<p><u>Connected learning strategies</u></p>  <p>Connected Learning Strategies and Integration in Digital Systems Languages: English, French, Italian, Portuguese, Spanish</p>
<p><u>Critical thinking Infographics</u></p>  <p>Critical thinking Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Critical Thinking</u></p>  <p>Esprit critique Language: French, with subtitles</p>
<p><u>Connected Resources to augmented critical methodologies</u></p>  <p>Connected Resources to augmented critical methodologies Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Connected and Critical Strategies and Postures</u></p>  <p>Connected and Critical Strategies and Postures Languages: English, French, Italian, Portuguese, Spanish</p>

NOOC COLLABORATIVE LEARNING and RESEARCH METHODOLOGY

University of Catania

Main concepts

The NOOC in Collaborative Learning and Research Methodology (CLRM) introduces participants to practical tools and techniques for planning, executing, and evaluating courses and lessons organized on the base of Collaborative Learning and Research or Inquiry based learning methodologies.

The course emphasizes collaborative learning (CL) as a useful general methodological approach to be used in higher education environments, since it departs from traditional teacher-centred approaches to focus on a student-centred program and on joint intellectual engagement among them. Supported by constructivist (Vygotsky, 1978; Smith & MacGregor, 1992), cognitive (Stahl, 2013), and sociocultural theories (Vygotsky & Kozulin, 1989), CL is based on four key assumptions about learning as active, immersive, multimodal and inherently social.

The CL methodology proposed in this NOOC draws back on recent cognitive research and particularly on the 4E Cognition theory. CL is based on the idea that:

- Cognition is always embedded, embodied, enacted and extended.
- The learning process greatly depends on positive social interactions, and on the construction of multimodal, accessible, digital environments.

By leveraging the interplay of these elements, keeping in mind distributed cognition theory while developing lessons and courses, the opportunities for richer learning experiences has been proven to increase (Karasavvidis, 2002).

In order to promote the construction of interactive, flexible, multimodal and accessible learning environments, the NOOC suggests applying Computer-Supported Collaborative Learning (CSCL) methodologies, since digital tools support:

- Synchronous and asynchronous interactions,
- Promote discussion through forums,
- Enhance interaction through videos, and shared workspaces.

The use of multimodal resources — text, images, videos and animations— address the different learning styles (auditory, kinaesthetic, visual) and is aligned with contemporary requests in education on accessibility, interactivity, and personalization. By enabling learners to choose their preferred modes of learning and engagement, CSCL fosters deeper understanding and sustained interest in learning tasks.

For higher education, the NOOC further proposes to apply the Inquiry-Based Learning (IBL) or Research-Based Learning (RBL) methodology to create CL and CSCL learning environments, since it empowers students to become active agents in their education process. IBL and RBL methodologies focus on the process of discovery, guiding learners to ask questions, connect with real-life experiences, and explore answers. IBL and RBL promote:

- Critical thinking
- Problem-solving
- Self-directed learning. (Bybee et al., 2006; Pedaste et al., 2015).

By presenting Collaborative, Inquiry-Based and Research-Based Learning environments, the NOOC aims to foster a culture of innovation and lifelong learning in education. It highlights the transformative potential of technology in enriching the teaching and learning process while emphasizing the importance of equity and inclusivity in digital education.

Pedagogical Scenarios

NOOC CLRM explains in detail how to create collaborative learning environment by defining clear roles and rules to ensure effective teamwork and respectful communication. Within the course, participants engage in activities designed to develop their understanding of collaborative principles, such as using forums for discussion, completing group tasks, and experiencing testing and evaluation using digital tools.

An essential component of the course focuses on Distributed Cognition. This concept is critical for analysing teaching and learning processes. The development of complex learning environments—such as online learning, extended reality, and game-based learning—requires careful consideration of the cognitive processes involved in learning. According to distributed cognition principles, digital learning environments must be characterized by rich multimodal stimuli, diverse experiences, and interactive resources. To maximize the benefits for learners, it is necessary to reflect deeply on multimodal learning in relation to three key areas:

1. Instructional Design: creating educational experiences that effectively integrate various modes of information delivery.
2. Technological Innovation: emphasizing the role of emerging technologies in enhancing educational practices.
3. Multimodality Assessment: developing assessment strategies that recognize and evaluate the diverse ways learners engage with content.

By addressing these areas, educators can foster enhanced motivation, engagement, and performance among learners. This approach not only enriches the educational experience but also prepares learners to thrive in increasingly complex digital landscapes. All the more so as the course incorporates OERs, that introduce participants to digital tools and provide practical examples and explanations, enhancing their collaborative learning experience.

- The digital learning environment is also discussed in terms of its limitations, with attendant guidelines:
- A dedicated section about netiquette—essential etiquette for respectful and constructive communication within digital spaces—addresses the expectations of both instructors and students.
- A section is dedicated to the different learning styles (see. VARK Test: <https://vark-learn.com/>), and to the creation of accessible and flexible digital learning environments.
- The main aim of digital learning environments is to respond to the modern needs of learning in any place, at any time and at one's own pace.

The NOOC also provides a section about assessment possibilities, proposing a combination of digital formative and summative evaluations:

- Formative assessments, such as peer reviews and reflective exercises, help participants refine their skills in real-time.
- Summative assessments provide a comprehensive evaluation of their learning outcomes.

These assessments are aligned with collaborative goals, ensuring that individual contributions and group dynamics are both considered.

Finally, the NOOC emphasizes the importance of adapting learning courses to real-world contexts. For instance, participants are encouraged to explore how collaborative and inquiry-based methods can address interdisciplinary challenges in STEM and non-STEM fields.

By applying these strategies to practical scenarios, such as solving real-life problems or designing innovative research projects, educators develop transferable skills that can be used to enhance students' soft skills and prepare them for their future life at work.

References

Bybee, R. W., Taylor, J. A., Gardner, A., Van Scotter, P., Powell, J. C., Westbrook, A., & Landes, N. (2006). [The BSCS 5E instructional model: Origins and effectiveness](#). Colorado Springs, Co: BSCS, 5(88-98).

Karasavvidis, I. (2002). [Distributed cognition and educational practice](#). Journal of Interactive Learning Research, 13(1/2), 11-29.

Smith, B. L. & MacGregor, J. T. (1992). [What is collaborative learning?](#) In Goodsell , A., Maher, M., Tinto, V., Smith, B. L. & MacGregor J. T. (Eds.), [Collaborative Learning: A Sourcebook for Higher Education](#). Pennsylvania State University; USA, National center on postsecondary teaching, learning, and assessment publishing.

Stahl, G. (2013). [Theories of cognition in collaborative learning](#). In Hmelo-Silver, C., Chinn, C., Chan, C., O'Donnell, A. (Eds.), [The international handbook of collaborative learning](#). London, Routledge.

Vygotsky, L. S. (1978). Mind and Society: The Development of Higher Mental Processes. Harvard University Press.

Reading Material

- [Theoretical assumption of Collaborative Learning](#)
- [Netiquette](#)
- [Roles and Rules](#)
- [Inquiry Based Learning](#)
- [Distributed Cognition](#)
- [Computer Supported Collaborative Learning](#)
- [Digital Tools](#)
- [Course quality check](#)
- [Assessment](#)

Open Educational Resources

NOOC CLRM provides examples of tools and resources useful to create dynamic, interactive and animated contents for an academic course, such as Synthesia, Genial.ly, Canva, Prezi, H5P, etc. These tools support the creation of engaging multimedia content, which allow participants to delve into complex subjects through interactive videos, digital presentations, and gamified activities.

<p><u>General Introduction</u></p>  <p>Introduction Language: English, with subtitles</p>	<p><u>Getting started with Collaborative Learning</u></p>  <p>Getting started with Collaborative Learning Language: English, with subtitles</p>
<p><u>Collaborative Research Methodology</u></p>  <p>Collaborative and Research Methodology Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Distributed Cognition</u></p>  <p>Distributed cognition Languages: English, French, Italian, Portuguese, Spanish</p>
<p><u>Inquiry Based Learning</u></p>  <p>Inquiry based learning Language: English, with subtitles</p>	<p><u>CSCL</u></p>  <p>Computer Supported Collaborative learning Language: English, with subtitles</p>
<p><u>Strategic intelligence tool</u></p>  <p>Strategic Intelligence Tool Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Digital tools</u></p>  <p>Digital tools Language: English, with subtitles</p>
<p><u>Stopmotion video</u></p>  <p>The Idea - Collaboration Theory Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Netiquette</u></p>  <p>In my Course Languages: English, French, Italian, Portuguese, Spanish</p>

NOOC ACTIVE and GAMIFIED LEARNING

Universidade Aberta (Open University)

Main concepts

The NOOC Active and Gamified Learning (AGL) focuses on the methodology of active learning, seeking to highlight the contrast between transmissive teaching and active learning. It also discusses foundational concepts such as interaction and interactivity, types of interaction (teacher-student, student-student, student-content) that lead to active learning, as well as issues of transactional distance. In order to deepen an active learning methodology, greater emphasis is placed on the gamification of learning and on discussing conceptual meaning of gamification and its applications in learning. NOOC AGL provides a guided exploration of digital tools for gamified learning and a toolbox of experience for designing active and gamified learning activities.

One of the most important components of any learning experience is interaction, also valid for online education research (Moore, 1989; Dron, 2007; Dron & Anderson, 2014). In the field of distance education, Moore (1993) introduced, based on Dewey's transaction concept, the important concept of transactional distance. The non-physical co-presence of the subjects results in opening a particular space of interaction, "transactional distance". Transactional distance is a phenomenon of a psychological, communicational and pedagogical nature and not so much of a spatial or geographic nature.

Moore's theory is based on two variables that determine transactional distance: structure (course design) and dialogue (e.g. interaction between teacher and student). The feeling of distance perceived and experienced by the student is greater when there is no feeling of support or support, that is, when neither dialogue nor structure is present (Moore, 1977). There are students who need more structure and others who feel a greater need for dialogue, which leads to different learning experiences and to the concept of autonomy in learning (Saba and Shearer, 1994).

Although transactional distance is a widely used concept, it holds some confusion and inconsistency in its applicability that induced Dron (2007) to elaborate the concept of "transactional control". The concept of control was addressed by some authors such as Garrison and Bayton (1987, cited by Dron, 2007) who defined it as the opportunity and ability to influence directly and determine decisions related to the educational process. For this control to be successful, there must be a constant negotiation process between the teacher and the student in determining this control. If control is too focused on one of the elements, communication will be reduced. How this control takes place depends on how different macro (teacher, student and content) and micro (proficiency, support and independence) elements are balanced in bidirectional communication (Garrison, Anderson & Archer, 2000).

Looking at the history of the different pedagogical models in DL and online education, NOOC AGL identifies different ways in which transactional control takes place. If in the behaviourist/cognitivist models, control is based on what is determined by the teacher or the instructional designer, in constructivism there is a change in the locus of transactional control, very much motivated by the need to build knowledge in a group.

This control is increased by the power of gamification for active learning. Research has shown that gamification can have a positive impact on student learning outcomes. It can increase learner engagement and retention of content (Hamari and Koivisto (2015)). Furthermore, gamification can be used to foster a sense of community and collaboration among learners by incorporating social elements into the learning process, such as collaborative quests or team-based challenges. Learners can work together and learn from each other in a fun and engaging way, hence creating a sense of shared experience that fosters a positive learning community.

Pedagogical Scenarios

NOOC AGL is based in microlearning philosophy and introduces the participants to a general overview of the active and gamified learning methodologies and digital tools in higher education that promote students' active participation and engagement in learning activities and with application in different learning contexts and teaching practices.

Pedagogical scenarios for gamification and active learning follow a set of principles:

- Increased Engagement: Gamification makes learning more fun and interactive, which leads to increased engagement and motivation to learn.
- Improved Retention: When learning is enjoyable, learners are more likely to retain the information they have learned.
- Personalized Learning: Gamification allows learners to progress at their own pace, providing a more personalized learning experience.
- Instant Feedback: Gamification provides instant feedback, which allows learners to identify areas where they need improvement and adjust their learning accordingly.
- Teamwork and Collaboration: Gamification encourages teamwork and collaboration, as learners work together to solve challenges and achieve goals.
- Goal setting and Achievement: Gamification provides learners with clear goals and rewards for achieving them, which encourages them to strive for success.
- Real-World Application: Gamification can simulate real-world scenarios, providing learners with practical experience and skills that can be applied outside of the learning environment.
- Reduced Anxiety: Gamification reduces anxiety associated with learning by providing a safe and low-pressure environment to experiment and make mistakes.
- Increased Creativity: Gamification encourages learners to think creatively and come up with unique solutions to challenges, promoting innovation and creativity.
- Long-Term Motivation: Gamification creates a sense of achievement and progress, which motivates learners to continue learning and pursuing their goals.

The main objective of the NOOC is training through a microlearning approach in the design of teaching and learning following active and gamified methodologies. The specific goals are:

- Contrasting transmissive teaching with active learning active learning.
- Identifying the main characteristics of active learning.
- Characterizing the different types of interaction and of interactivity that lead to active learning.
- Understanding the meaning of the concept gamification and its applications in learning.
- Exploring digital tools for gamified learning.
- Designing active and gamified learning activities.

NOOC AGL is based in microlearning (nano contents) design with a modular structure consisting of two modules (topics) with small nuggets of contents. The first is dedicated to the Active Learning and the second one, to Gamified Learning. The modules are arranged in a recommended order, which participants do not necessarily have to follow strictly. Course participants are free to generate their own flexible learning paths within the content, following them at their own pace.







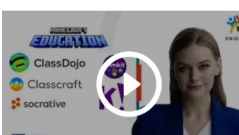

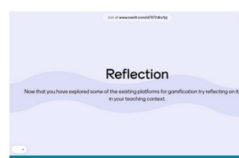

The other two modules are centred in small nuggets of contents with diversified open educational resources (OERS) with two main characteristics: interactive contents (OERi) (interactive videos, apps for interaction) and descriptive contents (OERd) (texts, narrated presentations) and supplementary topic-related resources and assessment components.

References

- Deterding, S., Khaled, R., Nacke, L. E., & Dixon, D. (2011). Gamification: Toward a definition. In CHI 2011 gamification workshop proceedings (p.6-9). ACM. http://gamification-research.org/wp-content/uploads/2011/04/02-Deterding_Khaled-Nacke-Dixon.pdf
- Dron, J.. (2007). Control and Constraint in E-Learning: Choosing When to Choose. Idea Group Publishing. <https://doi.org/10.4018/978-1-59904-390-6>
- Dron, J. & Anderson, T.. (2014). Teaching Crowds- Learning and Social Media. AU Press. <https://doi.org/10.15215/aupress/9781927356807.01>
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, 2, 87-105. [http://dx.doi.org/10.1016/S1096-7516\(00\)00016-6](http://dx.doi.org/10.1016/S1096-7516(00)00016-6)
- Hamari, J., & Koivisto, J. (2015). Why do people use gamification services?. *International journal information management*, <https://doi.org/10.1016/j.ijinfomgt.2015.04.006> 35(4), 419-431.
- Kapp, K.M. (2012). *The Gamification of Learning and Instruction: Game-Based Methods and Strategies for Training and Education*.
- Moore, M. G.. (1989). Editorial: three types of interaction. *American Journal of Distance Education*, 3(2), 1-6. [Taylor & Francis Online] <https://doi.org/10.1080/08923648909526659>
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22-38). Routledge.
- Saba, F.; & Shearer, R. L.. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *The American Journal of Distance Education*, 8(1), 36-59. <https://doi.org/10.1080/08923649409526844>
- Saraiva, F. (2017). *Gamificação numa rede social numa universidade virtual [Em linha]: o caso da Rede SOL*. Tese de Doutoramento, Universidade Aberta. <http://hdl.handle.net/10400.2/7349>
- Saraiva, F. B., Morgado, L., Rocio, V. (2019). Gamificação de uma plataforma social académica numa Universidade de Ensino a Distância, *Revista de Educação a Distância e Elearning*, 2, (1), 120-153, <https://doi.org/10.34627/vol2iss1pp120-153>
- Zaric, N., Roepke, R., Lukarov, V., & Schroeder, U. (2021). Gamified Learning Theory: The Moderating role of learners' learning tendencies. *International Journal of Serious Games*, 8(3), 71-91. <https://doi.org/10.17083/ijsg.v8i3.438>
- Zichermann, G., & Cunningham, C. (2011). *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*. O'Reilly Media.

Open Educational Resources

NOOC AGL provides examples of tools and resources useful to create interactive and gamified animated contents for an academic course, such as, inter alia, Socrative, Gimkit, Menti and Acrobat suite.

<p style="text-align: center;"><u>Introduction</u></p>  <p style="text-align: center;">Introduction Language: English, with subtitles</p>	<p style="text-align: center;"><u>Active learning</u></p>  <p style="text-align: center;">Active Learning Language: English, with subtitles</p>
<p style="text-align: center;"><u>Equivalence of Interaction & Transactional Distance</u></p>  <p style="text-align: center;">Equivalence of Interaction and Transactional Distance Language: English, with subtitles</p>	<p style="text-align: center;"><u>Kinds of Interactions</u></p>  <p style="text-align: center;">Kinds of Interaction Language: English, with subtitles</p>
<p style="text-align: center;"><u>Introduction to Gamification</u></p>  <p style="text-align: center;">Introduction to Gamification Language: English, with subtitles</p>	<p style="text-align: center;"><u>Gamification in Learning</u></p>  <p style="text-align: center;">Gamification in Learning Languages: English</p>
<p style="text-align: center;"><u>Gamification</u></p>  <p style="text-align: center;">Gamification Language: English, with subtitles</p>	<p style="text-align: center;"><u>Example of Gamification in daily life</u></p>  <p style="text-align: center;">Example of Gamification in daily life Languages: English</p>
<p style="text-align: center;"><u>Menti Interactive World Cloud</u></p>  <p style="text-align: center;">Interactive Word Cloud Languages: English</p>	<p style="text-align: center;"><u>Peer Assessment</u></p>  <p style="text-align: center;">Peer Assessment Language: English, with subtitles</p>

Main concepts

NOOC Inverted Methodologies (IM) focuses on inverted methodologies and the flipped classroom model. The course aims to prepare higher education faculty to design and deliver quality online learning experiences that address diverse learning styles and contexts and foster engagement for all learners. NOOC IM discusses fundamental theoretical concepts related to inverted educational methodologies (Lage, Platt, & Treglia, 2000), also known as flipped learning methodologies—active, learner-centred educational methodologies that have gained popularity recently and marked a significant paradigm shift in education (Bergmann & Sams, 2009; Baker, 2016).

The flipped learning model represents a blended learning framework that leverages modern technology-enhanced pedagogical strategies (Trairut & Jeerungsuwan, 2015; Ahmed, 2016). This approach redefines traditional learning environments by reversing the roles of individual and group learning spaces. The distinction between two terms often used interchangeably—flipped classroom and flipped learning (FL)—is thoroughly elucidated through the framework of four fundamental components, known as the "F-L-I-P pillars" (FLN, 2014). Bloom's Taxonomy, a widely recognized framework encompassing cognitive, affective, and psychomotor aspects of learning, has been adapted to align with flipped learning. In this revised model, lower-order cognitive tasks, such as remembering and understanding, are designed for student self-instruction through structured activities (Gomez & Paul, 2018; Anderson, et al., 2001).

NOOC IM explains in-depth how the broadly used instructional design methodology ADDIE (Kurt, 2017) could be effectively applied to flipped classroom design (Nurhayati, et al., 2021; Youhasan, et al., 2021). The macro-level framework, represented by the phases of the ADDIE methodology, is further refined providing practical steps for flipped classroom development and implementation (Karanicolas et al., 2017; University of Adelaide, 2017). Additionally, various strategies for implementing the flipped classroom model, which distinguishes one approach from another (ViewSonic, 2021), are outlined alongside recommendations for selecting an appropriate strategy based on specific contexts and needs.

NOOC IM discusses leveraging technological tools and applications to create engaging and effective learning content, a cornerstone of successful flipped learning. By integrating diverse formats and multimedia components, modern digital technologies enable educators to enhance the quality of teaching materials, fostering deeper comprehension of the topics covered (EDUCAUSE). The various types of flipped learning (FL) content are examined along with technical considerations and practical advice for improving video quality (Long, Logan, & Waugh, 2016; Yu & Gao, 2022).

NOOC IM focuses on the philosophy of open education, highlighting the free sharing of educational resources and knowledge. It emphasizes Open Educational Resources (OER) and their adoption to reduce costs and enhance access to quality learning for all students, regardless of socioeconomic status (UNESCO, 2019). Creative Commons licenses, enabling access, use, adaptation, and redistribution of OER with minimal restrictions are explored (Wiley, D., s.f.). Additionally, the repositories, platforms, and communities that support the discovery, collaboration, and co-creation of OER are presented (University of Maryland Global Campus, 2020).

Pedagogical Scenarios

Flipped Learning (FL) is an innovative educational approach that prioritizes active, personalized, and collaborative learning. In contrast to traditional methods, FL emphasizes higher-order cognitive skills, such as analysis and creation, utilizing cutting-edge technology to support differentiated instruction. This course is specifically designed for educators aiming to expand their expertise in implementing inverted/flipped methodologies, enhancing digital competencies, and effectively using ICT tools to foster engagement, support individualized learning, and create dynamic educational experiences.

The course has the following specific learning objectives:

Develop critical and reflective skills for applying flipped methodologies, fostering personalized learning, and transforming classrooms into inclusive, dynamic, and interactive spaces.

Enhance the design and implementation of effective flipped classroom models and strategies, promoting student-centred, active learning.

Explore and leverage digital tools and technologies to create content that facilitates autonomous learning, deepens comprehension, and motivates students.

Strengthen expertise in employing innovative teaching approaches and online technologies to deliver engaging educational experiences.

Advance the use of online communities and collaboration platforms for content sharing, expertise exchange, and collaborative program design based on flipped methodologies.

Adopt a humanistic, task-based, and collaborative approach, the course is designed to provide optimal learning conditions that are both effective and engaging.

Focus areas include student-centred activities, forum discussions, experience sharing, networking opportunities, and the use of interactive open educational resources (OERs) and collaboration platforms for co-creation and discovery. Additionally, technology-based approaches are explored to transform classrooms into dynamic, interactive learning environments.

Digital tools such as Genial.ly and H5P are incorporated to enhance the learning experience of participants, enabling the provision of engaging multimedia content, developed in the form of OERs including interactive informative cards, escape rooms, and gamified activities. These tools allow participants to explore complex topics through dynamic, interactive elements. Detailed practical examples, recommendations, strategies, and guidelines are provided to facilitate the effective integration of these approaches and resources into participants' pedagogical practices.

NOOC IM also includes various assessment tools, combining different evaluation strategies to measure progress throughout the training. The peer-to-peer review activity and forum discussions focused on reflective questions, related to the central themes and key topics encourage collaboration among the participants and forming a community of practice.


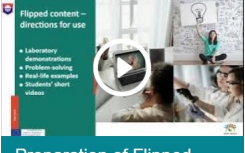
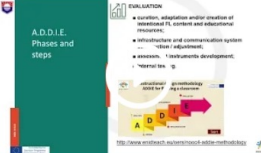
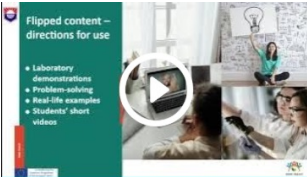


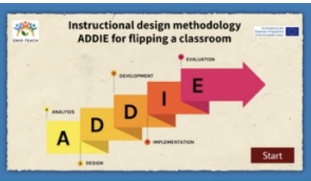


NOOC IM underscores the significance of customizing learning pathways to suit diverse audiences and contexts, facilitated by active participation in collaborative platforms and professional communities that exchange knowledge, expertise, best practices, and resources. Participants are encouraged to design and share flipped classroom scenarios tailored to subjects, themes, and real-world challenges, as well as to formulate innovative research projects. The course integrates theoretical frameworks with practical implementation, equipping participants to advance student-centred approaches, stimulate active participation, and cultivate critical thinking skills. The methodology enables educators to effectively apply inverted or flipped strategies, thereby optimizing educational outcomes across a range of academic environments

References

- Ahmed, H. (2016). Flipped Learning As A New Educational Paradigm: An Analytical Critical Study. *European Scientific Journal, ESJ*, 12(10), 417-444
- Anderson L., Krathwohl D., Airasian P., Cruikshank K., Mayer R., Pintrich P., Raths J., Wittrock M. (2001). *Taxonomy for Learning, Teaching, and Assessing, A: A Revision of Bloom's Taxonomy of Educational Objectives, Abridged Edition*, ISBN 080131903X
- Baker, J. (2016). The Origins of "The Classroom Flip". 1st Annual HE Flipped Learning Conference (pp. 15-25). Greeley, Colorado
- Bergmann, J., & Sams, A. (2009). Remixing Chemistry Class: Two Colorado Teachers Make Vodcasts of Their Lectures to Free Up Class Time for Hands-On Activities. *Learning and leading with technology*, 36, 22-27.
- EDUCAUSE. (s.f.). Short and Sweet: The Educational Benefits of Microlectures and Active Learning. <https://er.educause.edu/articles/2022/2/short-and-sweet-the-educational-benefits-of-microlectures-and-active-learning>
- FLN. (2014). Flipped Learning Network. What is Flipped Learning <https://flippedlearning.org/definition-of-flipped-learning/>
- Gomez, L., & Paul, A. (2018). Learning and Teaching at Navitas. Scaffolding learning and maximising engagement. <https://learningandteaching-navitas.com/scaffolding-learning-maximising-engagement/>
- Karanicolas, S., Snelling, K. & Winning, T., 2017. The Flipped Classroom Explained. <https://www.adelaide.edu.au/flipped-classroom/the-flipped-classroom-explained#view-the-text-version-of-the-above-image>
- Kurt, S., 2017. Definitions of The Addie Model - Educational Technology. Educational Technology. Available at: <https://educationaltechnology.net/definitions-addie-model/>
- Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment. *Journal of Economic Education*, 31, 30-43. <http://dx.doi.org/10.2307/1183338>.
- Long, T., Logan, J., & Waugh, M. (2016). Students' perceptions of the value of using videos as a pre-class learning experience in the flipped classroom. *TechTrends*. <https://link.springer.com/article/10.1007/s11528-016-0045-4>
- Nurhayati, N., Ampera, D., Chalid, S. & Farihah, . F., 2021. Development of Blended Learning Type and Flipped Classroom-Based Cultural Arts Subjects. *International Journal of Education in Mathematics*. <https://doi.org/10.46328/ijemst.1975>
- UNESCO, 2019. Recommendation on Open Educational Resources (OER). <https://www.unesco.org/en/legal-affairs/recommendation-open-educational-resources-oer>
- University of Adelaide, 2017. Steps to Flipping With a Framework STEP 1 LEARNING OUTCOMES AND KEY CONCEPTS. https://nursing.jhu.edu/faculty_research/faculty/departments/office-education-quality-innovation/documents/7_Steps_to_Flipping_UAdelaide.pdf
- University of Maryland Global Campus, 2020. Library. <https://libguides.umgc.edu/>
- Wiley, D., s.f. Defining the "Open" in Open Content and Open Educational Resources. <https://opencontent.org/definition/>
- Youhasan, P., Chen, Y., Lyndon, M. & Henning, M., 2021. Exploring the pedagogical design features of the flipped classroom in undergraduate nursing education: a systematic review. <https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-021-00555-w>
- Yu, Z., & Gao, M. (2022). Effects of Video Length on a Flipped English Classroom.

Open Educational Resources

NOOC IM provides examples of digital tools such as, inter alia, Genial.ly and H5P, incorporated to enhance the learning experience of participants, enabling the provision of engaging multimedia content, such as interactive informative cards, escape rooms, and gamified activities.

<p><u>Introduction to the course: inverted methodologies</u></p>  <p>Introduction</p> <p>Languages: English, with subtitles</p>	<p><u>Inverted Methodologies : Theoretical framework</u></p>  <p>Preparation of Flipped Classroom Learning Content</p> <p>Languages: English, with subtitles</p>	<p><u>Inverted Methodologies: Models and strategies</u></p>  <p>Models and Strategies</p> <p>Languages: English, with subtitles</p>
<p><u>Preparation of Flipped Classroom : Learning Content</u></p>  <p>Preparation of Flipped Classroom Learning Content</p> <p>Languages: English, with subtitles</p>	<p><u>Open Educational Resources and Collaboration Platforms</u></p>  <p>Searching CC licensed content</p> <p>Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Flipped Classroom Pillars</u></p>  <p>Flipped Classroom Pillars</p> <p>Languages: English, French, Italian, Portuguese, Spanish</p>
<p><u>Addie Methodology</u></p>  <p>ADDIE Methodology</p> <p>Languages: English, Spanish</p>	<p><u>Video Tools for Flipped Learning</u></p>  <p>Video Tools for Flipped Learning</p> <p>Languages: English, Spanish</p>	<p><u>“Searching CC-licensed content</u></p>  <p>Searching CC licensed content</p> <p>Languages: English, French, Italian, Portuguese, Spanish</p>

NOOC DESIGN OF FLEXIBLE LEARNING DIGITAL PROGRAMS

Universidad Nacional de Educación a Distancia (UNED)

Main concepts

One of the great challenges for this 21st-century university is to make education more flexible by being responsible for the comprehensive education of its students in a more extended context. This situation raises questions such as: how can education be more flexible? What does it mean for universities to be flexible?

The NOOC Design of flexible learning digital programs (DFLDP) considers that flexible digital pedagogy is an ideal resource for the implementation of teaching practices. With the support of digitization, such a process allows the teaching process to adapt to the needs of the students while giving a pedagogical response to unforeseen situations. In short, it is a pedagogy that adapts to different scenarios and pedagogical situations, as well as to different student profiles, it also implements a diversity of ways of teaching and learning.

The difficulty of defining flexible digital pedagogy lies, firstly, in understanding what flexibility is in this context and, secondly, in identifying what variables are to be taken into account. Flexibility in distance education has had multiple approaches:

In many cases, flexible education has been defined exclusively in terms of space and time, reducing it to the concept of ubiquity (anytime, anywhere).

Other more comprehensive approaches have defined it in terms of a richer set of variables: variety of content, time, resources, demands and assessments (Collis and Moonen, 2001).

Ling et al. (2004) have defined it as the degree of adaptability and accessibility of teaching to learners (flexibility in pace, place, content, learning style, assessment, individual or group work)

The International Council for Open and Distance Education (2009) sees it as a means to achieve an increasingly open, global and flexible education.

NOOC DFLDP follows Santoveña-Casal's considerations according to which flexible digital pedagogies focus on flexible and blended learning processes, centred on the learner, as well as on dynamic formulas of organization, on the variety of pedagogies implemented and on the development of accessible and inclusive content, always taking universal learning design as a frame of reference (Santoveña-Casal, 2023). Flexible learning is a learner-centred approach to learning (Willems, 2011) that adapts to learners' needs, which implies that learners learn when they want to (frequency, schedule, duration), how they want to (modes of learning) and what they want to learn about (Van den Brande, 1993, p. 2).

Pedagogical Scenarios

In order to implement learning processes based on flexible methodologies, NOOC DFLDP considers several key aspects. These include logistical and pedagogical flexibility, accessibility of content, and the integration of Universal Design for Learning (UDL) principles. These elements allow for the creation of inclusive pedagogical scenarios adapted to the needs of all learners, promoting a more equitable and effective learning experience. According to Collis and Moonen (2011), two major interconnected lines apply in the change of the university: logistical flexibility and pedagogical flexibility, which can be understood as strategies that offer students the possibility of choosing the different learning activities based on how we train ourselves, what we need to know, where, when and with whom we have to learn, according to Santoveña-Casal (2023). The concept of logistical flexibility refers to practical aspects and adaptability in learning environments and is a central feature of open learning. It therefore covers when learners want to learn (frequency, timing, duration).

Logistical flexibility for universities implies, according to Salinas (2022):

- Learning presents flexibility of place, time, methods and teaching-learning rhythms,
- Presenting a learner-centred model,
- Whose aim is to help learners to become autonomous in their lifelong learning,
- Where the role of the teacher changes, becoming a mentor and facilitator of learning.

Pedagogical flexibility refers to how and what they want to learn, connecting directly to teaching and the learning process itself. This approach takes into account the diversity of learning styles and the integration of multimedia formats that facilitate accessible and personalised learning. It also involves adapting forms of assessment so that learners can choose activities that best suit their interests and needs, such as self-assessments, group work or the creation of multimedia resources.

Pedagogical flexibility for universities implies, according to Willems (2011):

- Flexibility in relation to multimedia formats and social media.
- Adaptation of environments to personal learning styles.
- Applicable and useful content for society and learners' future.
- Adaptation of the assessment system

Accessibility is a peculiarity that virtual environments, as well as objects, tools and devices must have to be used by all people regardless of their unique characteristics. If certain learners cannot access digital environments and materials in acceptable conditions, their education will be fragmented with a less authentic understanding of reality. Accessibility basics are linked to:

Formats and styles;

- Typeface: Verdana or Arial, size 12-14 point.
- Use normal font; avoid italics, underlining and non-horizontal text.
- Capital letters only for titles.
- Images on the right, not interspersed; explain abbreviations/acronyms.
- Clear and simple language.

Accessibility;

- High text-background contrast.
- Textual descriptions for audiovisuals; subtitles and audio control.
- Clear and descriptive links; avoid tables or provide summaries.
- Images labelled as 'Figure' and alternative text added.
- Inclusive communication;
- Use inclusive language (e.g., students, teachers).
- Include gender perspective, avoiding bias.

Universal Design for Learning (UDL) is a learning model that provides diverse teaching options, promotes pedagogical processes that are accessible to all types of learners and that adjusts to different learning needs and paces (Figueroa et. al, 2019). The principles of UDL, according to Rose and Meyer, (2002) and Pastor (2012) are:

- Providing multiple means of representation, which refers to the What of learning and is based on the differences shown by learners.
- Providing multiple means of action and expression, which refers to the How it happens.
- Providing multiple forms of involvement, based on the existence of a brain network and referring to the Why.

This NOOC seeks to establish the necessary bases to design and develop courses based on a microlearning model, from a theoretical-practical perspective, for the improvement of digital, flexible teaching practice, building a distributed learning network.

References

Collis, B., y Moonen, J. (2001). Flexible Learning in a Digital World: Experiences and Expectations. London: Kogan Page.

Collis, B., y Moonen, J. (2011). Flexibilidad en la educación superior: Revisión de expectativas [Flexibility in Higher Education: Revisiting Expectations]. Comunicar, 37, 15-25. <https://doi.org/10.3916/C37-2011-02-01>

[Conferencia Carmen Alba Pastor - Diseño Universal para el Aprendizaje DUA - FILBO 2019](#)

Figueroa, L., Ospina, M. y Tuberquia, J. (2019). Prácticas pedagógicas inclusivas desde el diseño universal de aprendizaje y plan individual de ajuste razonable. Inclusión y Desarrollo, 6 (2), 4-14.

International Council for Open and Distance Education (2009). Flexible Education for All: Open—Global—Innovative, 23rd ICDE World Conference M-2009.

Ling, P., Arger, G., Smallwood, H., Toomey, R., Kirkpatrick, D. y Barnard, I. (2001). The Effectiveness of Models of Flexible Provision of Higher Education. Canberra, Australia: Department of Education, Science and Training.

Recursos Aula. [Diseño Universal para el Aprendizaje \(DUA\)](#).

Salinas, J. (2004). Innovación docente y uso de las TIC en la enseñanza universitaria. Revista de universidad y Sociedad del Conocimiento (RUSC), 1 (1).




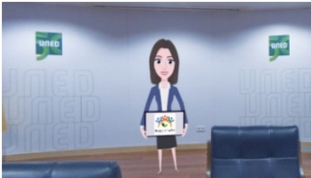





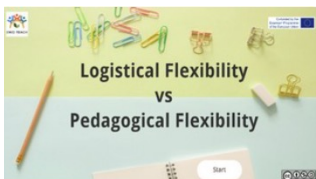

Santoveña-Casal, S. (2023). Investigación en pedagogías digitales: conectadas, colaborativas, gamificadas y flexibles. Octaedro.

[Teachings in Education, Universal Design for Learning: UDL.](#)

Willems, J. (2011). Students' perceptions: Flexing pedagogy and practice. En Burge, E., Campbell Gibson, C. y Gibson, T. Flexible Pedagogy, Flexible Practice Notes from the Trenches of Distance Education. Au Press. Creative Commons.

Open Educational Resources

NOOC DFLDP provides examples of digital tools such as, inter alia, Genial.ly, Educaplay, 3DVista and multimedia content.

<p><u>Exploring Digital and Flexible Pedagogies</u></p>  <p>Topic 1. Exploring Digital and Flexible Pedagogies Language: English, with subtitles</p>	<p><u>Design of Flexible Training Programs</u></p>  <p>Topic 2. Design of flexible training programs based on methodological richness Language: English, with subtitles</p>	<p><u>Flexible Learning objects</u></p>  <p>Topic 3. Flexible Learning Objects Language: English, with subtitles</p>
<p><u>Introduction to the Nooc</u></p>  <p>Introduction to NOOC5 Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Flexible Learning Methodologies</u></p>  <p>Flexible Learning Methodologies Language: English</p>	<p><u>Design Flexible Training Programmes</u></p>  <p>Design Flexible Training Programmes Languages: English, French, Italian, Portuguese, Spanish</p>
<p><u>Organizational Flexibility and Teaching Flexibility</u></p>  <p>Organizational Flexibility and Teaching Flexibility Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Universal Design for Learning</u></p>  <p>Universal Design for Learning Languages: English, French, Italian, Portuguese, Spanish</p>	<p><u>Design Flexible and Digital Programmes</u></p>  <p>Design Flexible Training Programmes Languages: English, French, Italian, Portuguese, Spanish</p>
<p><u>Logistical Flexibility and Pedagogical Flexibility</u></p>  <p>Logistical Flexibility and Pedagogical Flexibility Language: English</p>	<p><u>Flexible Learning Methodologies</u></p>  <p>Flexible Learning Methodologies Languages: English, French, Italian, Portuguese, Spanish</p>	

EMERGING TRENDS: sustainability and accessibility of OERs and artificial intelligence in education

MAG Uninettuno srl

Sustainability and Accessibility of OERs

The ENID-TEACH project, in designing training courses on d-flexible education, was in itself a place to experiment with innovative digital technologies. Thus ENID-TEACH OERs were introduced in the five different NOOCs. They use innovative tools to deliver knowledge in an interactive and engaging way and to exemplify how innovative tools can be used to design new materials for digital and flexible education. Interactive videos, digital escape rooms, interactive presentations and immersive 360° videos were produced, with much attention given not only to innovativeness and interactivity, but also to reusability and accessibility.

Reusability

All OERs, in addition to being open by definition, were made to be as reusable as possible (licensed under CC BY-NC-SA). The videos produced are available on the project's YouTube channel and can be freely embedded in websites or e-learning platforms, making them easily accessible and adaptable to different educational contexts. Interactive OERs offer a high degree of reusability. Contents created with Genial.ly include features that allow them to be easily embedded into websites, social media, and educational platforms. In addition, they have been published in a “reusable” mode, allowing any Genial.ly user to integrate them into their own work environment and to modify them freely to suit their own needs. Contents created through the H5P platform also have a feature to be embedded in websites. In addition, they have a “reuse content” feature that allows either downloading the resource offline in .h5p format or copying it to the application's cloud platform: in both cases the user can then edit and develop them further. Online quizzes made with Educaplay and interactive 360° videos can also be embedded in other websites. This strategy is designed for the sustainability of the project, to ensure that the results live on after it is over.

Accessibility

Paradoxically, while it is easier to make traditional educational contents (texts, slides, videos) accessible, it is more difficult to make interactive educational contents accessible, as, by their very nature, their functions are critical to individuals with sensory disabilities. The problem can be addressed either at the web platform level or at the individual OER level.

At the web site level, several plug-ins can add global accessibility features to web sites. Installed on the entire website, they follow the WCAG international standards and provide advanced functionalities: they range from simply changing site colours or enlarging fonts to highlighting interactive features and more complex audio interpretation of a website. A solution has been tested on the ENID-TEACH site. Since these plug-ins are general in nature and do not know the contents of the sites, the quality of the result depends on their effectiveness in interpreting the contents, which makes them perform better for static and traditional contents rather than for interactive contents.

At the OER level, more accurate accessibility features can be obtained. This is more time-consuming because it is necessary to operate at the level of individual OERs rather than the entire website. It requires the OER development tools to have accessibility tools available. For example, the Genial.ly platform allows OERs to be created with accessibility features such as the ability to add alternative text to visual elements, information about text labels and keyboard navigation, as well as compliance with the SCROM format.

Artificial Intelligence in Education

The introduction of ChatGPT in November 2022, followed by the rapid spread of numerous applications based on Large Language Models (LLMs), has suddenly made Generative Artificial Intelligence (GAI) and Machine Learning technologies, once reserved for a small group of experts, accessible to the public. This disruptive change has had a significant impact in many areas, including education.

Several studies have investigated the potential applications of GAI in education to improve teaching and learning. The ENID-TEACH project, which was conceived before the spread of LLMs, has been able to conduct some preliminary experiments, such as using AI to generate automatically interactive exercises. However, it is now clear that GAI will be a key element of “D-flexible education” in the coming years.

Some of the most promising uses of GAI in education are:

- **Personalization of learning:** AI enables the creation of personalized learning paths, tailoring the content and pace of instruction to the individual needs of students. This approach increases learning engagement and effectiveness by allowing students to manage their own sequence of study according to their personal goals.
- **Support for teachers and students:** AI tools can ease teachers' workload by automating tasks such as preparing quizzes and correcting assignments. AI-powered platforms, (chatbots, conversational agents...), offer 24/7 support to students by answering their queries, guiding them through course materials, and providing instant feedback. This allows educators to focus on more meaningful activities, improving the quality of teaching.
- **Assessment and feedback:** AI offers advanced tools for assessment and feedback. Through natural language analysis, it can provide timely and personalized feedback on student progress. Educators can gain deeper insights into student progress, facilitating more targeted and effective interventions while promoting a growth-oriented mindset among learners. They can also be used by students to self-evaluate and understand their strengths and areas for improvement.
- **Adaptive learning:** such systems harness data on student interactions and behaviours to design optimal learning experiences. These technologies dynamically adjust instructional strategies to meet individual needs, so that all learners remain engaged and challenged.
- **Learning analytics:** AI tools can be used to predict the students' performances, proactively identifying the ones at risk of disengagement or dropout and initiate targeted support measures to address these issues early, promoting better retention and academic success
- **Assistance for disabilities:** AI can be used to develop tools that assist students with disabilities, such as speech-to-text systems, real-time translation tools, and advanced accessibility features for learning platforms, making learning more accessible to all.

University teachers are encouraged to reflect on the possibilities offered by these technologies, evaluating their potential and limitations to integrate them effectively into their teaching. They must consider that the change is now inescapable, so neglecting the use of AI in education may disappoint the expectations of students, who are often digital natives and tend to use these technologies without critical thinking but more frequently than their teachers.

Furthermore, university teachers must consider that the use of AI in general, and particularly in education, raises important ethical and privacy issues. It is critical to ensure that the use of AI is fair and respectful of individual rights by addressing concerns about the collection and analysis of student data. Since students are often unaware of these issues, it is the duty of teachers to know about them to enable responsible and informed use of GAI.

CONCLUSION

The conclusions of this experience in digital and flexible microlearning can be structured along four main lines. Firstly, the design of a training programme focused on digital and flexible methodologies. Secondly, the identification and analysis of the main key outcomes associated with the methodologies implemented. Thirdly, the evaluation of the quality of the training programme, supported by the satisfaction indexes obtained. Finally, the establishment and strengthening of an international network as a result of this initiative.

Defining key learning outcomes

The design of training programmes based on microlearning, such as microlessons and NOOCs (NANO Open, Massive and Online Courses), constitutes an innovative educational strategy that responds to the demands of pedagogical and logistical flexibility. The experience developed over three years and four editions of courses in the framework of the ENID-Tech project has involved a significant effort for both the design team and the teaching staff, in establishing a learning model that facilitates agile and flexible access to the entire participating population.

In this case, the target participants have been university lecturers, a group that faces specific challenges. On the one hand, their heavy workload can make it difficult not only to participate in added training programmes, but also to complete the courses they have started. On the other hand, this group is distinguished by a significant commitment to innovation and improvement of educational practice, which favours the adoption and implementation of programmes based on microlearning.

From this experience, it is clear that the design of courses under this methodology requires to take into consideration a set of key variables. These include the promotion of effective learning through short lessons, conceptually meaningful and practically applicable content, as well as a user-friendly and highly usable design. In addition, it is essential to ensure inclusive access to content, with multilingual, digital, accessible and open access resources, using attractive and innovative pedagogical tools that enhance the learning experience.

The following are the integrated key learning outcomes of the methodologies analysed:

- Course design focused on disciplinary connection and student autonomy, ensuring flexibility, accessibility and digitisation of content.
- Adaptation of training programmes to real and interdisciplinary contexts, using collaborative and inquiry-based methodologies to address practical problems and design innovative projects.
- Use of digital tools and active strategies that encourage active student participation and applicability in different educational contexts.
- Implementation of blended assessment strategies, such as peer review and reflective forums, that promote collaborative learning and the building of communities of practice.
- Customisation of learning pathways tailored to the needs of diverse audiences, integrating learner-centred approaches such as flipped classrooms and projects aimed at developing critical thinking.
- Development of microlearning-based courses that prioritise accessibility, multimodality and interactivity, promoting innovative teaching practices and distributed networked learning.

Evaluating the quality of the NOOCs: participants' satisfaction

This guide to good practices cannot end without mentioning what the participants thought about the courses they have taken part in over the four editions of the NOOCs. Evaluation was an integral part of the iterative process, to modify content according to feedback. To this end, the consortium partners elaborated a multilingual evaluation tool (a questionnaire) and applied it to all the courses and iterations. The evaluation covered various dimensions: course structure and organization, e-learning platform, contents, resources, activities and ... evaluation.

In general terms, the results point to a high overall level of satisfaction in most dimensions, with the participants' responses standing at 80% or higher, in most dimensions. The challenges that remain in this type of training are the reinforcement of the communication processes as well as the cohesion and usability of the tools.

Overall, participants expressed a positive general satisfaction with the learning experience on the NOOC courses and the perception of the applicability of the pedagogical proposals and scenarios to academic educational contexts in their higher education institutions across Europe.

This quality control confirms that NOOCs respond to a certain demand from teachers and professors: their compressed timeframe and specific objectives with small tasks confirms that they fit some expectations that are result oriented, with measurable outcomes.

The digital component in training was also in line with expectations, as professors and teachers need constant updating in the acquisition of new digital competences so as to keep up with their student population.

The development of Interactive OERs and Descriptive OERs also suited the needs to be able to re-use and recycle some resources as well as being able to access them in an a-synchronous manner. All OERs will remain accessible on the project website for five years, till 2030.

Joining the network

Finally, the construction and development of the ReColn-TaD network represents an important strengthening of the interactional relationships between university faculty members, who act on the strength of weak links, facilitating the exchange of innovative experiences and the acquisition of new information. This network also extends to other professionals and faculty interested in sharing good practices, offering solutions that adapt to different scenarios depending on the circumstances.

We invite you to become part of this dynamic and enriching community! Sign up and contribute to the exchange of knowledge and the construction of a more collaborative and innovative educational future.



ENID-TEACH

To find out more about this topic,
[visit our website!](#)

Explore all our educational resources on
flexible learning programme design [here!](#)

[Enrol in the ReCoIn-TaD community](#)

Acknowledgments

This guide would not have been possible without the support and expertise of :

Pascale Garreau, Sophia Hamadi (Savoir Devenir), Olivier Poursac and the Unesco chair Savoir Devenir (Sorbonne Nouvelle University)

Francesca Vigo and Salvatore Ciancitto (University of Catania)

Elizabeth Souza, Elisa Areias, João Pinto, Maria Antonieta Rocha, Luísa Aires, Ana Paula Oliveira and the Laboratory of Distance Education and eLearning (LE@D) (UAB)

María Dolores Fernández Pérez, Susana Regina López, Gloria Soto Martínez, Nieves Márquez Takahashi, Raúl González Fernández, María del Mar, Román García, David Jiménez Hernandez and Alejandro Ignacio Rodríguez (UNED)

