**Unit 1. Designing evidence-based teaching and learning strategies that foster self-regulated learning in VLE**



Introduction

When designing evidence-based teaching and learning strategies, it is important not just to talk about what data can be collected, but to focus on how to design teaching and learning in a way that supports students' metacognitive learning. Knowing which metacognitive strategies support student engagement, performance and self-regulated learning can help you decide which tools to use to collect digital evidence on learners’ behaviour.

Good learning analytics starts with thinking about how activities and tools are being set up, and how they are going to generate evidence and data that could inform teaching and learning. This learning design phase refers to planning strategies for data collection, i.e., when teachers plan and develop their curriculum and the course. When designing the course, the teacher should pre-plan activities, assignments, assessments, learning resources, and tools, which would generate data on learners’ progress and allow to raise teachers’ and learners’ awareness of the learning process and progress.

In this unit we will show you how to design metacognitive teaching and learning strategies (1.1.), how to set course activities settings to track learners’ engagement (1.2.) and, finally, how to select and embed digital tools that capture data on learner progress (1.3.).

Topics

1.1. How to design metacognitive teaching and learning strategies?

1.2. How to set course activities’ settings to track learners’ engagement?

1.3. How to select and embed digital tools that capture data on learner progress?

Outcomes

1. To design metacognitive teaching and learning strategies that facilitate learners’ engagement
2. To select and configure tools that support metacognitive learning activities and generate data on learning design or learning progress.
3. To use digital technologies to provide targeted and timely feedback to learners.
4. To use digital technologies (e.g., blogs, diaries, planning tools) to allow learners to plan their own learning.

Definitions (Moodle Glossary)

* **Data:** in the context of this framework, data is the information we collect about students. It can come from forms, tests, learners’ interaction with learning resources or activities, etc.
* **Data literacy**: The ability to find, evaluate and read data critically, often beyond their numerical and quantitative form. Learning analytics focuses on the collection and generation of learners’ data to improve teaching and learning experiences. However, it depends on teachers’ and learners’ digital literacy skills whether LA-generated data inform teaching and learning or not.
* **Evidence-based learning and teaching (EBLT):** Evidence-based learning and teaching, as described by the EUA report includes several steps: (1) decision of the question to address, (2) collection and analysis of the evidence, (3) design, objectives and assessment indicators, (4) implementation and practice, (5) taking decisions based on evidence to improve the process (Emplit & Zhang, 2020).
* **Learning analytics**: it is a tool for assessment, interpretation, and analysis of learner-generated data in the online learning environment, in order to make the learning and teaching processes more efficient by the teacher on interventions needed to advise or consult learners in due time to enhance their academic success. (Volungeviciene et al., 2021, 12). There are four main categories of learning analytics: (1) descriptive (what happened?); (2) predictive (what will happen next?); (3) diagnostic (why did it happen?); (4) prescriptive (do this to improve).
* **Metacognitive decision-making**: awareness of specific teaching and learning design decisions and the reasons behind those decisions (Griffith et al., 2016).
* **Self-regulated learning:** Self-regulated learning is an important conceptual framework that includes several aspects of learning: cognitive, metacognitive, behavioural, motivational, and emotional (Panadero, 2017). Zimmerman (2000) developed a SRL cyclical phases model organised in three phases: (1) forethought, (2) performance and (3) self-reflection. In the first phase, students set their goals, activate learning strategies, and try to accomplish their objectives; in the performance phase, they execute the task, monitor their progress, and use strategies to keep engagement and motivation. Finally, in the self-reflection phase, students evaluate their performance, which will affect their later performance positively or negatively. (Zimmerman & Moylen, 2009; Panadero, 2017).
* **Competency:** A general statement that describes the desired knowledge, skills, and behaviours of a student graduating from a program (or completing a course). Competencies commonly define the applied skills and knowledge that enable people to successfully perform in professional, educational, and other life contexts (Gosselin, 2020).
* **Learning outcome:** A specific statement that describes exactly what a student will be able to do in some measurable way. There may be more than one measurable outcome defined for a given competency (Gosselin, 2020).
* **Social presence:** According to Rourke et al. (2001, p. 51), “social presence is the ability of learners to project their personal characteristics into the community of inquiry, thereby presenting themselves as “real people”.
* SRL - Self-regulated learning
* LA - Learning analytics
* MOOC - Massive open online course
* LAD - Learning analytics dashboard
* VLE - Virtual learning environment
* LMS - Learning management system
* Digital evidence - information and data of value to an investigation that is stored on, received or transmitted by an electronic device (Electronic CSI, 2008).
* Metacognition - a critical component of successful learning, which involves self-regulation and self-reflection of the learning process and controls one’s thinking processes (Medina et al., 2017).
* Teaching and learning strategies - techniques and methods that a teacher applies to support students’ learning. Effective teaching strategies include pre planning,outlining learning goals and criteria for success, and consistently providing feedback (Maine, N/A; NSW Government, 2022).

Strategies and recommendations on how to design learning and assessment strategies that generates digital evidence to assists learners in planning their own learning

* **Pedagogical point**  **of**  **view:**
	+ Plan and decide in advance which Moodle tools and activities are important and need to be used in the course
	+ Explain learning outcomes and goals clearly
	+ Use frequent questions to check for understanding during the lesson/course
	+ Design learning activities that foster collaboration and use of digital tools
	+ Summarise the new learning content to be acquired in a graphical way (infographics, Venn diagrams, mind maps, flow-charts)
	+ Encourage learners’ engagement by presenting learning material in different formats (textual, video, audio) to reflect their different learning styles
	+ Favour feedback and feedback among peers
	+ Foster student collaboration and co-creation of educational artefacts
	+ Teach the strategies underpinning the executions of tasks rather than just content (making connections, self-verbalising, problem solving)
	+ Nurture meta-cognition (students have to think about the effectiveness of their learning choices and figure out how to improve them to achieve better results).
* **Technical point**  **of**  **view:**
	+ Add an assignment activity ([tutorial on assignment activity](https://docs.moodle.org/400/en/Assignment_activity)).
	+ Add a feedback activity (it can be used as a tool for summative assessment, feedback, selection, etc.) ([tutorial on feedback activity](https://docs.moodle.org/400/en/Feedback_activity)).
	+ Add learning outcomes used in a course ([tutorial on how to add learning outcomes)](https://docs.moodle.org/400/en/Outcomes).
	+ Activate discussion forum ([tutorial of forum activity](https://docs.moodle.org/400/en/Forum_activity)).
	+ Activate activity completion tracking ([tutorial on activity completion](https://docs.moodle.org/311/en/Tracking_progress#Activity_completion)).
	+ Link learning activities with the learning outcomes ([tutorial](https://www.youtube.com/watch?v=LCYbjmqyLbg)).
	+ Check the interactive opportunities for metacognition and reflection provided by a VLE (e.g., learners’ portfolios).
	+ Check the opportunities provided by forums for feedback provision.
	+ Check the different technical solutions as well as tools for co-creation (e.g. wikis) provided by a VLE.

REFERENCES

**Electronic CSI, A Guide for First Responders, 2nd edition, National Institute of Justice, April 2008.** [**https://nij.ojp.gov/digital-evidence-and-forensics**](https://nij.ojp.gov/digital-evidence-and-forensics)

Emplit, P. and Zhang, T. (2020). *Evidence-based approaches to learning and teaching*, Learning and Teaching Paper #11, Thematic peer group report, EUA. <https://eua.eu/downloads/publications/eua%20report%20evidence-based%20approaches_web.pdf>

Griffith, R., Bauml, M., & Quebec-Fuentes, S. (2016). Promoting metacognitive decision-making in teacher education. *Theory into Practice*, *55*(3), 242–249. <https://doi.org/10.1080/00405841.2016.1173997>

Gosselin, D. (2020). Competencies and learning outcomes. InTerGate. <https://serc.carleton.edu/integrate/programs/workforceprep/competencies_and_LO.html>

Medina, M. S., Castleberry, A. N., & Persky, A. M. (2017). Strategies for improving learner metacognition in health professional education. American Journal of Pharmaceutical Education, 81(4), 1–14. <https://doi.org/10.5688/ajpe81478>

NSW Government and The Learning bar (2022). Teaching strategies. <https://education.nsw.gov.au/student-wellbeing/tell-them-from-me/accessing-and-using-tell-them-from-me-data/tell-them-from-me-measures/teaching-strategies>

Maine, P. (N/A). Teaching and learning strategies: A classroom guide. <https://www.structural-learning.com/post/teaching-and-learning-strategies-a-classroom-guide>

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Front.Psychol.*, 8.<https://doi.org/10.3389/fpsyg.2017.00422>

Rourke, L., Anderson, T., Archer W., Garrison, D.R. (2001). Assessing social presence in asynchronous, text-based computer conferences. Journal of Distance Education, 14, pp. 51-70

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press. [https://doi.org/10.1016/B978-012109890-2/50031-7](https://psycnet.apa.org/doi/10.1016/B978-012109890-2/50031-7)

Zimmerman, B. J., & Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Handbook of metacognition in education* (pp. 299–315). Routledge/Taylor & Francis Group.

Volungeviciene, A., Tereseviciene, M., & Trepule, E. (2021). Learning Analytics: a Metacognitive Tool to Engage Students. Research study. Sciendo.<https://doi.org/10.2478/9788366675643>