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Future-Focused:

Educating in an Era of Continuous Change

Supporting the hidden curriculum: A layered open microlearning design model for inclusive learning in higher education

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The hidden curriculum includes unspoken and unwritten expectations that can impact student success, often reinforcing inequities in marginalised student groups. While often overlooked when enacting curriculum, addressing the implicit learning requirements of hidden curriculum is crucial for fostering inclusive and equitable academic experiences. Drawing on existing literature and case studies at Charles Darwin University, this paper presents a layered design model for Open Microlearning (OML) as a novel approach to explicitly support and scaffold hidden curriculum in higher education. OML combines Open Educational Practice with microlearning principles to provide quick, flexible, and bite-sized learning experiences using freely available, reusable resources and encourages collaboration with others. The layered model supports modular and accessible design, grounded in pedagogical intent and responsive to diverse learner needs. The layered structure allows for a clear separation of key components within the design, enabling focused attention to enhance overall coherence and effectiveness. The flexibility and adaptability of the OML layered model enables just-in-time learning to bridge hidden curriculum gaps and empower students to engage meaningfully with their learning and assessment.

Keywords: Open microlearning, hidden curriculum, higher education, inclusive pedagogy, learning design, case study

Introduction

Higher education (HE) in recent years has seen a big shift to more flexible approaches which present an opportunity to promote more equitable learning environments. The hidden curriculum includes unspoken and unwritten expectations that can impact student success, often reinforcing inequities in marginalised student groups (Blundell-Birtill et al., 2024; Semper & Blasco, 2018). One promising solution for adaptive, scalable and learner-centred education to address hidden curriculum is open microlearning (OML). OML combines Open Educational Practice (OEP) with microlearning principles to provide quick, flexible, and bite-sized learning experiences using freely available, reusable resources and encourages collaboration with others (Lockley,2024). These OML offerings can be embedded with, or used alongside, existing HE courses.

The use of microlearning aligns effectively with today's fast-paced environment, meeting the needs of modern social learners (Mostrady et al., 2024), and is increasingly leveraged across diverse fields including health, education, engineering, and language learning (Corbeil et al., 2021; Gherman et al., 2022; Leong et al., 2021). While sometimes confused with microcredentials, microlearning is about the learning process itself, whereas microcredentials are formal recognition of competency or mastery. When microlearning is combined with OEP, it fosters progressive approaches, collaboration and co-creation of knowledge (Ossiannilsson,2020), ideal for quality learning. The focused OML units, usually completed in 5-15 minutes, can support on-demand and just-in-time learning (JIT), and are particularly valuable for institutions seeking to broaden participation and personalise learning pathways across diverse contexts.

This paper introduces a conceptual layers model for the design of OML, to bridge hidden curriculum gaps in HE digital environments. The model supports the design of learning that is not only modular and accessible but also grounded in pedagogical intent and responsive to diverse learner needs. By outlining key design considerations across multiple layers, from foundational to optimisation, this Layered OML Design Model aims to guide educators and instructional designers in creating sustainable and impactful open microlearning experiences to support the hidden curriculum.

Open microlearning in higher education

Online learning spaces are becoming increasingly international and intercultural (Heaster-Ekholm Kristen, 2020) and should be designed with inclusion and accessibility in mind. OML provides opportunities for well-designed materials that are collaboratively created and constantly updated by a community of educators and subject matter experts. The use of OEP supports learners to create meaning through communication and sharing experiences with others (Major & Calandrino, 2018), reducing the cost of education, and fostering innovation (Ossiannilsson, 2020). OEP also affords academic learning design that is more responsive and responsible (Conrad & Prinsloo, 2020) in relation to learning content and building opportunities for learners to integrate formal and informal learning practices, networks, and identities.

OEP and microlearning create a pedagogical synergy that enhances flexibility and engagement in HE. Microlearning has gained popularity as evolving technology enhanced learning (TEL) meets the needs of learners with limited time or attention spans, who prefer to learn in short bursts (Leong et al., 2021; Taylor & Hung, 2022). Jahnke et al. (2020) and Monib et al. (2025) agree that microlearning can improve student performance across disciplines as well as improve motivations and engagement. Further, Khong and Kabilan (2022) highlight the potential for microlearning to empower self-directed lifelong learning and foster autonomy, outcomes similarly supported by OEP (Lockley, 2024; Ossiannilsson, 2020).

Designing for hidden curriculum

Designing for the hidden curriculum requires attention to flexibility and accessibility, particularly as HE students are from diverse backgrounds with varied support needs (Blundell-Birtill et al., 2024; Semper & Blasco, 2018). While OML offers many opportunities, design challenges may hinder its adoption and development. To address this, OML design should purposefully integrate learning theories and contemporary design frameworks to ensure pedagogical coherence, alignment with learner needs, and a streamlined experience that supports micro-scale offerings. Table 1 summarises the implications for OML from key learning design theories.

Table 1:
Influencing theories for design of OML

Theory	Implications for OML design
Cognitive Load Theory (Sweller, 2011)	Keep learning experiences short and focused on one learning outcome. Remove unnecessary content. Include activities with immediate feedback.
The Cognitive Theory of Multimedia Learning (Mayer, 2014)	Use multimedia, such as video and infographics, to maximise learning. Follow multimedia learning principles, such as coherence and signalling, to enhance the learning experience.
Constructivism & Social Constructivism (Vygotsky, 1978)	Prompt learners to connect new insights with prior experiences. Include interactive, real-world tasks and reflective checkpoints or prompts. Encourage peer collaboration and learning from other.
Social Learning Theory (Bandura, 1977)	Provide opportunities for observation, interaction, reinforcement, and reflection. Use brief demonstrations followed by immediate practice.
Connectivism (Siemens, 2005)	Encourage learners to explore a variety of media. Provide a space where learners can share, discuss, and build upon the learning materials.
Situated Learning Theory (Lave & Wenger, 1991)	Be context-specific and relevant to the learner's environment, with authentic tasks that relate to real-life challenges.
Self-Determination Theory (Deci & Ryan, 2015)	Allow flexible pathways and self-paced content. Give immediate feedback. Include collaboration and real-world activities.

While a wide range of learning design frameworks are commonly applied in online learning contexts (Heaster-Ekholm, 2020), there is limited guidance available for designing specifically for OML. Additionally, learning design

frameworks such as ADDIE extend beyond the scope of design to include implementation and review. Table 2 summarises key insights adapted from Heaster-Ekholm (2020) and their application to OML design.

Table 2:
Frameworks informing OML design layered model

Framework	Applications in OML Design Model
Universal Design for Learning (UDL)	Design in multiple formats with flexible pathways and pacing to meet diverse needs, fostering meaningful learning through learner action and reflection.
ADDIE	Define learning outcomes and align assessments, activities, and content using an iterative process that accommodates adaptations to address diversity and inclusion.
Bloom's Taxonomy	Develop OML objectives at targeted cognitive levels and align assessments and activities accordingly. Activate relevant contextual or cultural knowledge.

Case studies at CDU

Two pilot studies at CDU explored OML interventions for hidden curriculum relating to assessment expectations for use of PowerPoint and video. These pilot studies were run over 2 semesters, with over 250 students accessing the OML units. Feedback has been very positive, with very little improvement recommended by students, other than a desire for more examples. The development model used to assemble the OML module and sample layout is shown in Figure 1 below.

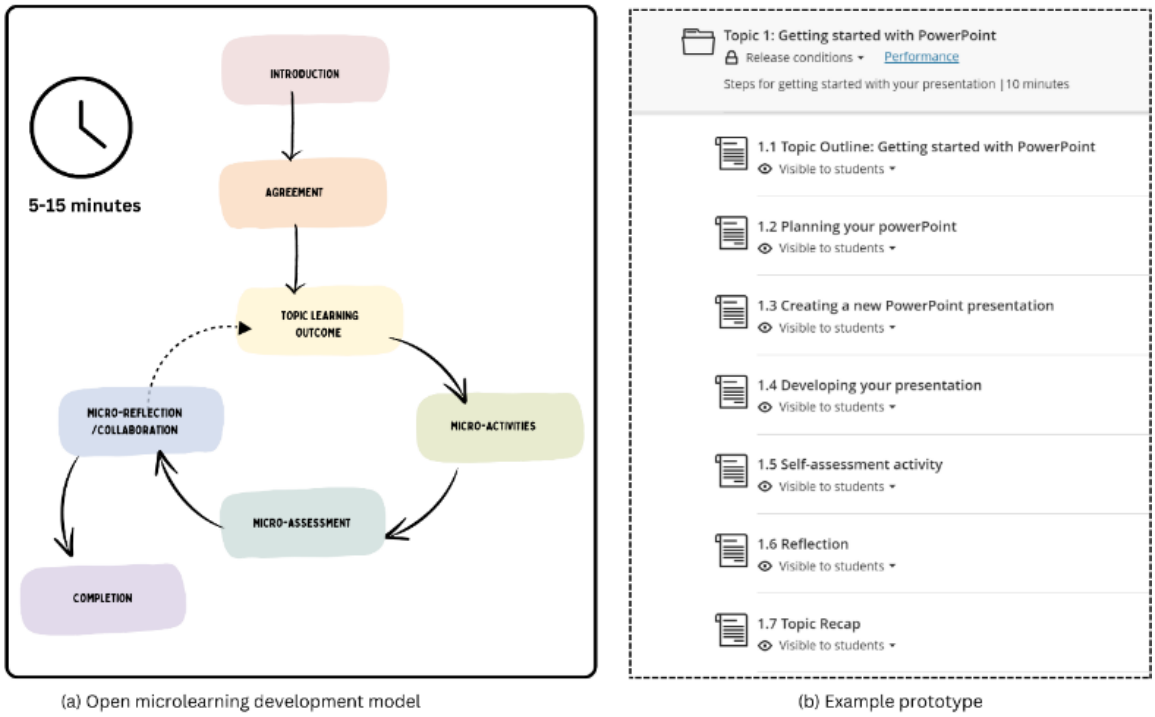

Figure 1: Development model used for OML pilots at CDU (Lockley, 2024)

A Layered model approach for OML design

A layered model allows for a clear separation of important considerations in OML design, supporting a focused approach to specific challenges. The layers can also help define support needs, refine details during planning, and guide layer-specific evaluation or strategic analysis.

The layered OML design model presented in this paper informed by a combination of insights from theory (Table 1), learning design frameworks (Table 2) and practice (Figure 1). These insights inform how and why to include

specific design elements, as well as what to include and prioritise. Table 3 summarises the layers in OML design, outlining their purpose, principles, practices associated, and some of the associated tools.

Table 3
Summary of Layers in Open Microlearning Design

Layer	*Purpose*	*Principles*	*Practices*	*Tools*
Foundation **1**	Establish a strong foundation for the OML experience	- Concise objectives for bite-size learning - Learner-centric - Accessible, inclusive and flexible	- Identify knowledge, skills, and attributes needed - Define learning objectives - Align assessments and activities	- Surveys - Assessment design tools
Structure **2**	Provide a clear structure for organising OML	- Clear layout for short, focused learning. - Intuitive navigation and logical flow.	- Design learning paths. - Develop bite-size layouts - Use clear design and development processes	- Planning and design templates
Elements **3**	Targeted and engaging learning elements	- Prioritise relevance - Concise and engaging content - Use OER /OEP	- Align, scaffold and streamline elements - Purposeful multimedia - Minimise cognitive load	- Content creation tools
Interaction **4**	Foster interaction to enhance OML	- Learner interaction and collaboration. - Feedback and reflection. - Social learning	- Interactive and authentic - Automatic feedback. - Demonstrations, sharing and discussions	- Resource development tools - Social tools
Optimisation **5**	Improve the OML experience	- Data-driven insights - Contemporary TEL approaches - Self-directed pathways	- Monitor progress - Collect feedback - Iterate and improve offerings (close the loop)	- Analytics, LMS tracking - Surveys

The Layered OML Design Model can be presented visually as a pyramid (Figure 3), with each tier highlighting a key aspect of the design process. The layers align with specific actions and guiding questions, supporting reflection, practical application and integration within the overall OML design process. In practice, this model is a tool to guide targeted OML module design, and for informing inclusive and learner-centred approaches.

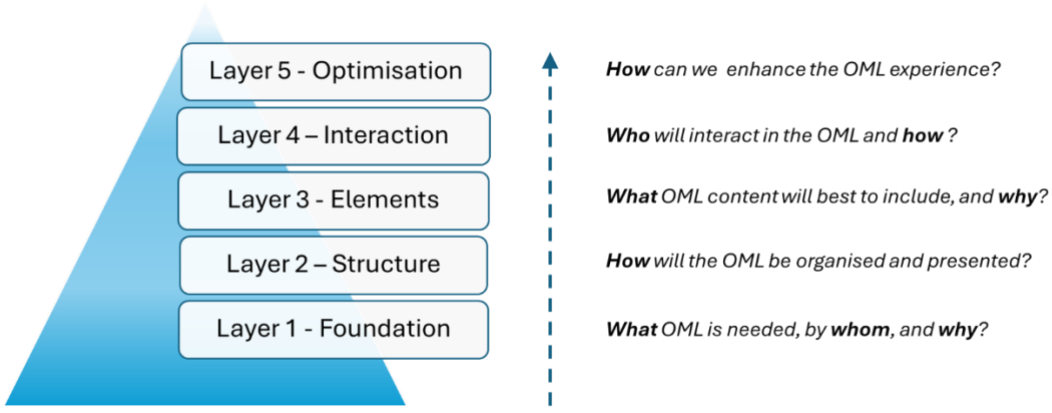

Figure 2: Layers Model for Open Microlearning Design with guiding questions

Conclusion

Following a structured approach supports more effective and efficient JIT design for OML. The layers model allows for a clear separation of key components within the design, enabling focused attention to enhance overall coherence and effectiveness. The layered model supports modular and accessible design, that is grounded in pedagogical intent and contemporary learning approaches. The flexibility and adaptability of the

OML layered model enables targeted, efficient support that bridges hidden curriculum gaps and empowers diverse learners to engage meaningfully with their learning and assessment.

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