



SCIENCE OF LEARNING
RESEARCH CENTRE

Higher Education Learning Framework Matrix

An evidence-informed model for university learning

The Higher Education Learning Framework (HELF) is a research project of the Science of Learning Research Centre (SLRC), a Special Research Initiative of the Australian Research Council.

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HIGHER EDUCATION LEARNING FRAMEWORK (HEL F) PROJECT

BACKGROUND

This project aimed to develop an evidence-informed model for university learning in the form of a Higher Education Learning Framework. This was achieved through a synthesis of existing frameworks, literature, and research on the topic along with a set of national and international expert interviews offering the latest thinking on university learning. This framework has been developed through a Science of Learning lens that threads together the often-disparate thinking in education, neuroscience, and psychology to offer a convergent framework on effective learning in higher education that can broadly guide the higher education sector.

The HELF Matrix is a 1-page overview outlining the Teacher, Student, and Assessment implications of the of the HELF Principles.

Seven HELF Principles have been proposed:

1. *'A university education provides a learning experience that broadens students knowing and being for life beyond the classroom'*
2. *'Learning occurs in context, and context can be used to enhance the learning experience'*
3. *'Emotions play a role in how and why students learn'*
4. *'Leverage the social dynamics of learning to enhance the learning experience'*
5. *'Challenge and difficulty can be beneficial for students' learning process'*
6. *'When students employ effective methods of thinking, and understand how they learn, they can improve the way they learn'*
7. *'Learning is built on prior knowledge and engages students in deep and meaningful thinking and feeling'*

NOTES

- The principles are not prescriptive but merely suggestive, depending on the appropriate learning/teaching conditions. For instance, a high-quality learning experience does not require all the principles to be addressed.
- The order of presentation of the principles is not intended to be sequential or hierarchical.
- As to be expected, all the principles have some degree of inter-relatedness due to the inherent nature of learning itself.

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HIGHER EDUCATION LEARNING FRAMEWORK

OVERARCHING THEME & PRINCIPLE

		IMPLICATIONS FOR TEACHERS	IMPLICATIONS FOR STUDENTS	IMPLICATIONS FOR ASSESSMENT
OVERARCHING THEME & PRINCIPLE	Learning as 'becoming'	<p>A university education provides a learning experience that broadens students' knowing and being for life beyond the classroom</p> <p>Consider students' future career paths and their time at university as an integrated experience; predicating your teaching towards them and their learning experiences not as finite 'students' but as 'evolving professionals'.</p> <p>Explore with students how undertaking a course or degree program can influence their self-identity, and encourage students to be open to exploring how it impacts upon their perceptions, beliefs, social interactions, and behaviours, inside and outside of the classroom.</p> <p>Discuss with students how the broader contexts of community and society influence a student, and how they in turn can influence community and society.</p> <p>Explore with students both the epistemology of knowledge, and how it is students' responsibility to examine and question that knowledge.</p> <p>Encourage students to adopt a mindset of education as a lifelong pursuit.</p>	<p>Avoid relying on lecturers as an absolute source of knowledge, but rather appreciate lecturers as facilitators of knowledge. In doing so, take the responsibility to critically examine the discipline knowledge offered by lecturers and develop your own epistemology around that discipline knowledge.</p> <p>Engage in formal or informal self-reflection to explore how the broader contexts of community and society influence what you have been learning, and how you can influence community and society through your learning.</p> <p>Reflect upon how your learning influences your self-identity, and be open to exploring how that influences your beliefs, perceptions, social interactions, and behaviours, inside and outside of the classroom.</p>	<p>Include a variety of self-reflective assessments, so that students have time designed into the course to examine and self-reflect on their learning from an ontological perspective.</p> <p>A distal outcome of assessment should be that students are able to attest and explain what their knowledge and skills means to the world and their discipline. This is a step beyond simply explaining what specified bodies of disciplinary knowledge and skills they have acquired, but what that knowledge and skills means for their ability to impact and influence society at large, and how they can address problems outside of their discipline with their disciplinary knowledge and skills.</p>
	Contextual learning	<p>Learning occurs in context, and context can be leveraged to enhance the learning experience</p> <p>Utilise contextualised teaching approaches and techniques (e.g., case-based learning, project-based learning, simulated learning, professional guest speakers, etc.), or work-integrated learning experiences (e.g., practicums and internships) to provide opportunities for students to contextualise their learning to reflect disciplinary or professional practice.</p> <p>Integrate real-world problems as a vehicle to teach students about learning content as it is situated in the discipline, and concurrently examine with students the analytical methods and techniques that occur in disciplinary/professional practice.</p> <p>Facilitate student thinking about course content across multiple contexts, including those in a student's real life (e.g., casual job, local community, weekly sporting team, or home life). Noting that good quality learning can take place inside and outside of the classroom, even when transferred to unrelated or novel contexts.</p> <p>Recognise a student's own ability in self-directing their learning towards a contextualised learning experience, and work together to co-create that learning experience.</p> <p>Regularly consult and engage with relevant stakeholders across industry (e.g., government and representative professionals), community (e.g., NGOs) and alumni (e.g., graduates working in discipline) to examine how courses can remain 'current' in how they contextually reflect practice. Also, utilise these relationships to draw upon opportunities for industry to engage with courses and students.</p>	<p>Consider how course content can transfer contextually to other avenues of application, as well as to your chosen career path. This includes in your real world outside of academic contexts - casual job, local community, weekly sporting team, or home life.</p> <p>Seek out a variety of work-integrated learning experiences (e.g., practicums, internships, volunteer projects, etc.), both through university and outside of university.</p> <p>Attend industry events (e.g. networking meetings, public seminars, and conferences) to transfer/test your knowledge in informal work-related contexts, and immerse yourself in the culture and practices of that discipline.</p> <p>Explore the bi-directional relationship between academic and external contexts. For example, how professional practice can influence course learning content, and how course learning content can influence professional practice.</p> <p>When studying for exams explore the learning content in different contexts (e.g., try to imagine or simulate yourself applying the revision content in workplace scenarios or relevant novel contexts).</p>	<p>Explore ways assessment can be contextualised so that it reflects more authentic and real-world contexts (e.g., workplace scenarios). This can occur at any level of assessment. For instance, multiple choice questions have the potential for being contextualised in a similar way to essay questions.</p> <p>When considering the type of assessment items to employ in a course, consult with industry to understand the type of tasks/challenges professionals in that discipline experience, these can be emulated into student assessment items. For instance, in some courses a briefing letter may more authentically contextualise a written assessment item than an argumentative essay.</p> <p>Utilising informal assessment in courses can be very effective for student learning. This is even more the case when that informal assessment requires students to test their knowledge across different and novel contexts/scenarios.</p> <p>Consider continuity between students experiencing both contextualised learning and assessment together. This means that authentic and contextualised assessment leads on from authentic and contextualised teaching.</p>
	Emotions and learning	<p>Emotions play a role in how and why students learn</p> <p>Promote a learning environment that engenders a sense of belonging and relatedness, and foster a positive and enjoyable learning culture.</p> <p>Build quality relationships with students focusing on the meaning derived from students' engagement with a lecturer, not just upon the quantity of time spent with a lecturer.</p> <p>Help to assure students' perceived 'effort to reward' relationships by making transparent the course design, and addressing arbitrary or bureaucratic elements that can undermine the fidelity of these relationships.</p> <p>Encourage students to develop their self-efficacy by having them set and explore mastery-related goals. Also engage in dialogues with them that reflect the malleable nature of their abilities and their capacity to improve.</p> <p>Foster students' perceptions of their autonomy and agency by providing them with flexibility and choice.</p> <p>Explore with students how they can regulate their emotions when learning.</p>	<p>Review the nature of the goals you set yourself around your learning, and seek to explore what value mastery-related goals can offer you as compared to only performance-orientated goals.</p> <p>Self-reflect and examine how you think about the malleability of your abilities, and seek to explore strategies for emotional self-regulation and resilience.</p> <p>Actively engage with fellow students and other social agents in your learning environment both within, and outside the classroom. By doing so, also seek to discover how you can relate with your peers through being open to shared experience.</p> <p>Foster your interest and curiosity in learning by intentionally finding relevance and meaning in learning content.</p>	<p>Explore how a course approach can focus upon a paradigm of explicitly communicating high expectations about students' ability to perform, offers opportunities for low stakes and regular assessment, and provides opportunities for high support though frequent developmental feedback.</p> <p>Offer feedback dialogues that are specific, timely, developmental, and outline how to improve. Avoid giving feedback that is deterministic or offers absolute judgment.</p> <p>Seek to balance the provision of awards for a course that are not just related to high academic achievement – for example include an award that focuses upon impact or innovation achievement, or alternatively have awards situated within external contexts of the community and industry that emphasise professional character attributes.</p>
	Interactive learning	<p>Leverage the social dynamics of learning to enhance the learning experience</p> <p>Promote social interactivity with diverse peers as part of the learning experience. At a simple level, this can mean incorporating peer-assisted learning activities into lectures and/or tutorials. At a more extensive level, this can mean having students engage in interdisciplinary courses, or projects, that involve a variety of students from different degrees learning together.</p> <p>Facilitate a culture among students that fosters shared values and beliefs, and is perceived as a safe and inclusive environment for students to exchange a diversity of perspectives.</p> <p>Appreciate that effective collaboration on learning tasks can take time, with successful collaboration requiring students to develop a level of social synchrony with each other.</p> <p>Promote students' capabilities to socially interact in an effective manner by exploring ways to develop their written and verbal communication skills.</p> <p>It is important that any strategies to promote the social dynamics of learning should avoid the arbitrary addition of social elements (e.g., group tasks) unless it clearly aligns with the learning content and objectives.</p>	<p>Self-reflect upon how social interactions enrich the diversity of perspectives you are exposed to, and what this means for your learning and thinking in terms of expanding your conceptual knowledge, ways of thinking, and cooperative skills.</p> <p>Explore opportunities to enrich the social dynamics of your learning by engaging in socially diverse learning experiences that are available to you. For example, taking elective courses in other disciplines to engage with students outside of your discipline, or enrolling in international exchange opportunities with external universities.</p> <p>Appreciate that effective collaboration and cooperative learning on tasks can take time, and it is often not immediate. Exercise patience and be open minded towards interactive learning tasks as a learning opportunity.</p> <p>Self-reflect upon how you can enhance the social dynamics of exchanging perspectives with others through your communication and social skills.</p>	<p>Where appropriate, incorporate a variety of socially interactive learning assessments in a course (e.g., group assignments and/or peer marking) that align with the learning content and objectives.</p> <p>In socially interactive learning assessments, include a self-reflective element that requires students to examine the social dynamics of the assessment, and the impacts upon their learning and thinking.</p>
	Learning to learn and higher order thinking	<p>When students employ effective methods of thinking, and understand how they learn, they can improve the way they learn</p> <p>Assist students in their methods of thinking with respect to the analysis and synthesis of learning content and problems, as well as providing guidance to reach answers. This can relate to how students deconstruct, explore, appraise, and reconstruct problems in both accurate/expected and inaccurate/non-expected ways.</p> <p>Support students to gain greater metacognitive awareness about their learning, and relatedly, to exercise greater metacognitive regulatory actions. This in turn will promote students' ability to self-regulate their learning.</p> <p>Strategically use the repertoire of labels related to higher order thinking skills when teaching and assessing students, and moreover, explicitly teach students what they mean (e.g., explaining, justifying, analysing, synthesising, applying, and/or evaluating; what are their respective methods and how do they converge and diverge).</p> <p>Aid students to be able to make evaluative judgments about their own capabilities or performance at any stage of learning (pre/post formal assessment).</p> <p>Explore how student opportunities for self-directed learning can be integrated with socially interactive learning or practice, and when and how they best complement each other, giving students the opportunity to make visible their learning.</p>	<p>Appreciate that being an effective thinker is about effective methods of thinking to learn and solve problems. This might involve not only reflecting upon the strengths and weaknesses of the solution to a problem, but also upon the strengths and weaknesses of the thinking processes/strategies used and their relative effectiveness.</p> <p>Challenge your thinking about the content you learn about in multiple dimensions by questioning assumptions, prevailing beliefs, and methods.</p> <p>Seek to make evaluative judgments about your own capabilities/performance at any stage of learning (pre/post formal assessment). This means developing your ability to make evaluative judgements in a rigorous way by producing learning criteria that are precisely defined and coherently applied.</p> <p>Take responsibility to critically examine the discipline knowledge offered by lecturers and peers, and develop your own epistemology around that discipline knowledge.</p> <p>Approach your learning as if you were to not only be tested on it, but also had to teach it. In doing so, examine how your learning relates or contrasts to other known/unknown contexts and application pathways.</p> <p>When revising lecture content explore and experiment with a range of studying strategies to see what works best for you. For instance, try practice testing, elaborative interrogation, and self-explanation, as these can be more effective than other approaches such as summarisation and serial re-exposure to learning content (e.g. re-reading/re-watching).</p>	<p>When designing assessments or introducing assessments to students, it is important to actively involve students in the creation or comprehension of the assessment criteria, as well as the application of the assessment criteria. In this way, it helps students identify, make sense of, and own the criteria that they need to apply to their own learning tasks or work, as well as their capability to make more robust evaluative judgments.</p> <p>When exploring assessment criteria with students, make sure to provide specific descriptions and exemplars that demonstrate the relevant aspects of the assessment criteria. In this way, it helps students to comprehend the standards associated with assessment criteria.</p> <p>Before, during and after assessment, explore ways to provide students with formal and informal feedback on their methods of thinking in solving problems, as well as the accuracy of their solutions.</p> <p>Consider how informal assessment and feedback opportunities can allow students to explore their methods of thinking by giving them the chance to generate multiple and varying ideas/proposals to solving problems, and the chance to critically explore their respective advantages and disadvantages through testing, refinement, and re-application.</p>
	Learning challenge and difficulty	<p>Challenge and difficulty can be beneficial for students' learning process</p> <p>Ensure learning content and activities have sufficient complexity to allow the learning mechanisms of challenge/difficulty to adequately operate, and that students have sufficient 'learning room' to experiment and take risks/fail (e.g., time allocation).</p> <p>Experiment with, and provide support for, ill-structured learning problems, unpredictability in learning content, and problem-based learning scenarios to facilitate the exploration of challenge and difficulty in student learning.</p> <p>Consider the use of interleaved practice for enhancing the learning potential of challenge and difficulty (e.g., conceptual contradictions and dynamic conceptual assumptions) as they explore different concepts and topics.</p> <p>Facilitate students to become more adept at dealing with, or self-regulating, the confusion and failure that can occur when experiencing learning challenges and difficulties. This can be achieved by helping students to recognise when they are confused, what their affective thresholds are for confusion and failure, and what strategies and actions can be taken to resolve confusion and failure.</p> <p>Foster a learner culture that endorses the utility and exploration of challenge/difficulty for learning, and non-stigmatisation of confusion and failure.</p> <p>Lecturers can share personal stories of experiencing learning challenges and difficulties, or even learning confusion and failure with students. In doing so, they should also try to model appropriate ways they have dealt with these experiences to optimise the learning process and learning outcomes.</p>	<p>Appreciate that being an effective thinker might involve dealing with learning challenges and difficulty, and even getting answers wrong or being confused, but that can be a part of an effective learning process, and those experiences merely serve as further information to advance the inquiry method being taken.</p> <p>Consider lecturers for their potential as sources of not only corrective feedback, but more importantly inquiry-driven guidance, as this can lead to more discovery on the way to expanding your learning. This might mean asking questions about your problem reasoning (e.g., asking about assumptions surrounding a theoretical premise to an essay argument, instead of asking for the 'correct' theoretical premise). Therefore, it's about asking the right types of questions to empower your learning, even if it takes longer to get to a solution.</p>	<p>Incorporate frequent informal, or low stakes, assessment opportunities for students so that they can experiment with the learning potential of challenge and difficulty, and take risks to fail or be confused. This might mean employing a series of staggered informal, or low stakes, assessment items that culminate to conceptually inform a related larger formal assessment item.</p> <p>Engage in dual feedback with students to assess their level of challenge/difficulty/confusion and discern when to provide, or delay, corrective feedback and scaffolding (i.e., so it is 'just in time'), and how much of this feedback is required to maintain optimal learning.</p> <p>Explore students' affective states and needs related to challenge and difficulty to identify the onset of negative affect (e.g., frustration). This can mean framing the learning experience to promote positive affect (e.g., curiosity).</p> <p>When engaging in feedback dialogues with students, it can be worthwhile exploring the reasoning to their solutions, irrespective of the solution accuracy (i.e., correct or wrong).</p>
Deep and meaningful learning	<p>Learning is built on connecting new understandings to prior knowledge and engages students in deep and meaningful thinking and feeling</p> <p>Provide meaning and context to help students connect current learning to prior experiences, acknowledging diversity of prior experience.</p> <p>Challenge students to think deeply about concepts and ideas, and offer the appropriate level of difficulty.</p> <p>Encourage students to challenge the content they learn about in multiple dimensions, this means encouraging students to critically question and challenge assumptions, prevailing beliefs, and methods.</p> <p>Encourage students to generate multiple and varying ideas and proposals to solving problems, and then critically explore their respective advantages and disadvantages to test, refine, and re-apply.</p> <p>Ensure learning content and activities have sufficient complexity and that students have sufficient 'learning room' to experiment, take risks, collaborate, and self-reflect.</p> <p>Appraise that students have sufficient prior knowledge to engage in the kinds of learning activities and outcomes expected.</p> <p>Provide certainty around the learning experience, ensuring task clarity, reducing irrelevant learning content, and non-pedagogically focussed instructional distractions.</p>	<p>Appreciate lecturers as facilitators of knowledge, and not as an absolute source of knowledge.</p> <p>Relate current learning to prior experiences.</p> <p>Intentionally find meaning and relevance to learning content.</p> <p>Use effective strategies to help connect new understandings to prior knowledge.</p> <p>Deliberately seek challenge to explore the complexity of concepts and the relationship between concepts, or at least don't shy away from it.</p>	<p>Assessment that provides opportunities for students to build on prior knowledge and involves problem solving activities that go beyond content knowledge.</p> <p>Emphasis on frequent formal and informal assessment with continual feedback.</p>	