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## INCORPORATING ASSESSMENTS AND FEEDBACK THROUGHOUT THE LEARNING EXPERIENCE

The last design aspect, assessments and feedback, is paramount for creating an impactful learning experience. Most assessment strategies focus on a specific topic and point in time during the course without connecting to the entire learning experience. For example, students read course content, participate in learning activities, and complete assessments as fragmented, linear, or separate events. It is important to look at assessments and feedback as learning experiences integrated into the entire course as students go in and out of flow throughout their course journey. In the integrated framework for designing the online learning experience, assessments and feedback focus on the learner perspective first and foremost, are intentionally incorporated into the entire learning experience during the course design, create flow and engagement, monitor student self-knowledge, leverage learner confidence, sustain learner motivation, and integrate learner agency. In this chapter, we explain the differences between assessments and feedback, provide ways for rethinking assessments and feedback as learning experiences, and provide strategies for incorporating assessments and feedback into learning experience design.

### Guiding Design Questions

- How can we better design assessments and feedback considering stages of learner development and prior learning?
- How can we incorporate assessments throughout the online learning experience?

- How can we design assessment activities to be more engaging and conducive to deep learning experiences?
- How can we use assessments and feedback to establish and sustain learner attention and motivation?
- How can we design assessments that help learners monitor their own learning?

## Differences Between Assessments and Feedback

In this book, we refer to *assessments* as strategies used to evaluate learners' content knowledge, demonstration of a skill or task, development of a product, or experience of a process. Assessments can be conducted at the start of a course when learners enter the online environment as a way to obtain information about learners' prior knowledge and throughout the course to determine if learners are acquiring knowledge or skills as evidence of learning progress. This type of assessment is formative, and the main purpose is to improve learning and provide information about learner development. Assessments at the end of the course are summative and they determine if learners met the course outcomes. Learning assessments are often connected to a rubric, standards, grade, or a badge. Although assessments of learning assignments are graded and feedback is not included in conventional design practices, we suggest assessments and feedback to be used interwoven with each other in order to create flow and impact learning.

*Feedback* is best described by Fink (2013) as "a dialogue with the learner" (p. 105). This dialogue may be between the learner and the content, the learner and the activity, the learner and the instructor, or among the learners with each other. Molloy and Boud (2014) said that feedback "acts like a mirror, to reflect back to the learner 'what their performances look like'" (p. 414). Though learners often view assessments as feedback, we should look at feedback as a system of learning instead of discrete episodes of instructors telling students about their performance. This perspective focuses on the premise that assessments and feedback as a design aspect are part of a process that sustains learner attention and motivation.

In this book, we move away from blocked assessments that test students on a specific topic infrequently (e.g., a midterm or a final exam). Blocked assessments are fragmented, linear, and decontextualized. Fragmentation means breaking assessments into separate episodes without connecting them into the entire course experience. In an online environment, assessments are often arranged in a linear order of events such as read content, participate in learning activities, and complete assessments. This order works like a

checklist without creating flow. *Decontextualized* means placing assessments in isolation from the context of the learning experience in the course. Our goal is to give greater emphasis to thinking, feeling, doing, and relating to others when creating assessments. Feedback is reframed as coaching in which learners are shown what they know and how they can do things better. This approach is learner-centered and holistic and takes advantage of new technologies and digital pedagogies. Technologies provide the means to create flow and connect design aspects with each other.

## **Rethinking Assessments and Feedback as Learning Experiences**

Assessments and feedback can have an impact on online learning success and student motivation. Lee (2014) found that online student satisfaction is closely related to explicit course expectations, clear guidelines on assignments, rubrics, and constructive feedback; however, these factors are often addressed as separate components in course design, rather than being contextualized as part of the entire learning experience.

Encouraging students to view assessments as engaging activities from which they can learn and grow rather than terminal judgments about themselves can be a challenge. Students tend to be assessment-focused, view assessment as a checklist leading to a grade, and expect to see the relevance of the learning activity to achieving their desired goals. Learning activities that are relevant and closely paired with assessments can motivate learners to engage with content and other course activities (Rogerson-Revell, 2015).

Rethinking assessments and feedback as learning activities involves moving away from functional fixedness. We suggest integrating assessments and feedback into the learning experience with the purpose of creating flow and engagement, monitoring learner self-knowledge, leveraging learner experience, sustaining learner motivation, and encouraging learner agency.

## ***Spacing and Interleaving Assessments to Create Flow and Engagement***

McCracken et al. (2012) talked about designing assessments as a sequence of events developed early on in the design process and aligned with the learning activities and outcomes. These events need to be integrated and connected with the design aspects and incorporated into the holistic learning experience. For example, spacing and interleaving (alternating) assessments between content presentations and learning activities or embedding assessments and connecting them to new learning can help students create relevant associations within content (Miller, 2014), maintain flow, and sustain engagement as the course progresses. Spacing and interleaving provide a way

to alternate topics and work on several related skills together instead of working one at a time. This approach may be more difficult for initial learning, but it pays off in long-term retention because learners circle back to previously exposed content (Roediger & Pyc, 2012).

*Flow* has been described as a holistic sensation of total involvement, a state when a person performing an activity is totally engaged in the activity. Pearce et al. (2005) proposed that flow can be a process rather than a state. Students may go in and out of flow throughout a task performance depending on the learner's skill and how challenging the task is. Sometimes students are not ready to learn a topic. Low-stakes assessments, such as short quizzes, spaced in-between topics, can provide students with feedback about their performance and where they need improvement. Low-stakes assessments can provide an opportunity for students to review the materials and retake the quiz. This type of assessment is formative and allows for further learning about the topic.

### *Using Learner Self-Assessment as a Tool to Monitor Self-Knowledge*

One strategy to use formative assessments is to ask students to self-assess their missteps in the test by reflecting what was done wrong and why and ask them to figure out how to make it better. This approach allows students to learn from mistakes and make judgments about their own performance. In this case, learners are at the center of the process and monitor their own learning (Molloy & Boud, 2014). This encourages self-knowledge and self-regulated learning, which impacts motivation for learning and performance.

In our integrated framework for designing the online learning experience, self-knowledge plays an important role in learning, because it can help to facilitate deep learning in students (Crisp, 2012). When students' self-knowledge is aligned with metacognitive awareness, they are more likely to appreciate what they do not understand and their ability to connect approaches to learning to unfamiliar situations (Wiggins et al., 2005), creating a more meaningful learning experience.

Self-assessment has been shown to have a positive influence on students' self-regulated learning and self-efficacy. It can increase self-regulatory actions related to learning goals when students monitor their own progress and evaluate and correct for errors. By taking control of their own learning and believing they can succeed on a task, students may also experience less fear of failure (Panadero et al., 2017).

### *Leveraging Learner Competence Through Instructor Feedback*

Instructor feedback has an influence in student self-assessments because students can overestimate their metacognitive abilities to self-assess objectively.

This overestimation of one's memory performance, also called illusions of competence, are held disproportionately when learners have high expectations about their performance (Koriat & Bjork, 2005). Therefore, instructor feedback can help students leverage their competence.

Also, there is a tendency for learners to have optimistic and miscalibrated perspectives about themselves when facing difficult tasks (Kruger & Dunning, 1999). *Calibration* is "a measure of the relationship between confidence in performance and accuracy of performance (Stone, 2000, p. 437). Instructor feedback can help learners expand knowledge and align confidence to match the learning reality. Instructor response to task performance can provide students tactics for improving their level of competence on a given subject or skill.

Instructor feedback is an opportunity to reinforce a growth mindset for learners. Students with a fixed mindset are only interested in knowing if they are right or wrong, if they passed or failed a test. Conversely, students with a growth mindset are interested in feedback that expands their knowledge and abilities; they gain from their mistakes and feedback (Dweck, 2006). A growth mindset requires time and effort on the part of learners, resulting in increased motivation and achievement. How feedback is provided can impact student motivation and growth in a course. Feedback directed at the process encourages a growth mindset; feedback directed at the person or outcomes can be negative and does not motivate learning.

### *Sustaining Learner Motivation Through Timing, Language, and Type of Feedback*

Timing of feedback can have an effect on learners' motivation and performance. Timing is related to frequency (regularly, consistently, and promptly). Regular feedback is ongoing throughout the course and helps learners to feel their work is recognized; consistent feedback is provided on a constant pace and gives self-confidence to learners. Prompt feedback is provided immediately after an assignment, a task, or a process. Learners feel feedback is most effective when it is provided immediately after task engagement because it solidifies their learning and guides understanding of concepts (Lehman & Conceição, 2014); however, delaying feedback on complex tasks may help learners reflect on the process (Molloy & Boud, 2014).

The language (or tone) of feedback can affect student performance and motivation too. The following five common types of feedback related to tone and language have been shown to be effective: praise, encouragement, recognition of insightful learning, constructive criticism, and rewards. In a study of teachers and students in the online environment, Lehman and Conceição

(2014) found that positive reinforcement worked as praise and encouragement for students to feel confident and motivated to persevere in the course; recognition of learners' progress assisted students in becoming aware of their learning development; constructive criticism provided insights on students' progress and helped them stay motivated to expand their learning. Using an optimistic tone during constructive criticism can impact learners' performance positively. For students who focus on rewards for going above and beyond assigned work, bonus points, extra credit, or assignment waivers can also reinforce motivation and a sense of accomplishment for students. Feedback can have implications for the cognitive and emotional dimensions of learning. When empathy, understanding, and care are part of the feedback message, students are likely to feel good and accomplished.

Digital technologies can help enhance instructor feedback and impact student learning and motivation. For the most part, instructors use text commentary when providing feedback in online courses; however, with the propagation of inexpensive digital technologies, it has become common for instructors to use rich media to provide learner feedback. Orlando (2016) has conducted a study comparing text, voice, and screen-casting feedback to online students. Students perceive that they retain content better when they receive voice feedback rather than text feedback. Also, voice feedback gives a better sense of instructor caring because the tone of voice gives a personal touch and sense of presence.

From an instructor perspective, voice feedback may be more efficient because it takes less time to record than writing a text comment. Voice feedback also allows learners to understand nuance, because it is difficult to express emotions in text format. For students, instructor voice feedback shows empathy and makes the online environment less lonely and more motivating; feedback is more in-depth because the instructor gives advice and is more encompassing of global issues with the focus on the content rather than the writing. An enhancement to voice feedback is screen-casting—video screen capture containing audio narration. Screen-casting has been shown to be a favorite for instructors compared to text feedback because it is more personal and creates a better emotional connection with students.

Digital technology can provide benefits for the quantity and quality of instructor feedback, but it depends on the course context, learner characteristics, and technology used in the course. LMSs now have the capability to use text, voice, and screen-casting for instructor feedback. It requires instructor technology training, understanding learners' needs, and matching the technology to the context of the course. Providing voice feedback on a long paper may not meet the needs of learners because the learner will be able to connect the feedback only if the paper is viewable on the screen; thus,

in this case the text format or screen-casting may be more appropriate so that the learner can view the paper and hear the instructor voice feedback. For instructor feedback that explains the process and requires nuances, voice feedback may be more appropriate. Feedback that requires demonstrating a process or a procedure may benefit from screen-casting.

### *Integrating Learner Agency Into Assessments and Feedback*

In the integrated framework, assessments and feedback work together and can equally impact student learning and should emphasize that the learner is the one with agency who constructs knowledge rather than the one who gains knowledge (Molloy & Boud, 2014). Therefore, it is important to rethink assessments and feedback in terms of the learner perspective using the four dimensions of learning.

From a cognitive perspective, assessments and feedback should be detailed to promote meaningful and impactful learning, build on previous learning in the course, encourage growth and development, and challenge and prompt learners to do more thinking about their own learning. From an emotional perspective, feedback should be encouraging and affirming to build self-confidence, timely so that students are motivated to learn, and conversational to create a sense of ease. From a behavioral perspective, assessments and feedback should encourage students to try new strategies, persist in the face of challenging tasks, and be an active contributor to the course design by reacting to the environment and providing input about changes. From a social perspective, assessments and feedback are about interacting and communicating with others in groups or teams and with the instructor and enabling feelings of understanding and sense of presence. When learners are given ownership of their own learning and feel they are active contributors to the learning environment by providing feedback, they will invest more, be more motivated, and show more interest in the task.

### **Incorporating Assessments and Feedback Into Learning Experience Design**

Assessments and feedback can guide students in constructing, connecting, and applying knowledge. Certain assessment strategies combined with feedback at different points of the course can provoke curiosity, create self-awareness of one's own learning, stimulate engagement with content and peers, and promote deep learning. Keeping in mind the four dimensions of learning, assessments and feedback are not mere fragmented approaches to evaluate student learning; rather, they should be integrated with content

interactions, learning activities, and social interactions to create optimal learning experiences. We suggest strategies for integrating assessments and feedback into the course design next.

### *Design Assessments and Feedback Based on a Learner Growth Mindset*

Instructors and course designers are inclined to create assessments from an instructional perspective without taking into account stages of learner development and prior knowledge. Learner-centered design means looking at assessments and feedback from the learner perspective. Assessments that place the learner at the center of the task are more likely to meet the mental, emotional, behavioral, and social needs of the learner. To help learners shift their mindset about assessments and feedback, instructor messages in the form of pedagogical wrappers can explain the goal of the activity and how learners will gain from feedback received by the instructor.

Pedagogical wrappers explaining the purpose and goal of the activity can help learners think of assessments and feedback as a strategy to expand their knowledge and abilities and learn from their mistakes, a chance to grow and develop. Encouraging learners to focus primarily on their learning process, rather than the product (final grade), should be intentionally designed. Feedback should stimulate thinking, feeling, doing, and relating with others as part of the learning experience.

### *Incorporate Emotional and Cognitive Elements Into Assessments and Feedback to Infuse Interest, Challenge, and Curiosity*

Incorporating emotions such as confusion, frustration, anxiety, challenge, delight, and surprise during the learning activity are more likely to promote deep learning, challenge learners' thinking, and infuse curiosity to continue to learn, but they are more effective if assessments and feedback strategies are intentionally incorporated into the activity. We provide a few examples of learning activities and how to incorporate emotional and cognitive elements into assessments and feedback.

#### *Concept Mapping*

Concept mapping is an activity that requires learners' construction of knowledge through the creation of a graphic representation of personal meaning, an external representation of schemas and structural knowledge (Jonassen et al., 1997). Building a concept map requires learners to identify concepts in a discipline-specific content area and relate these concepts with each other through concept hierarchy, propositions, and cross-links. Assessments can



include a rubric that delineates the concepts and terminologies indicating reorganization of learners' cognitive structure, changes of cognitive structure through relationships among concepts, and ability to communicate understanding through the graphic representation.

When concept mapping, learners can acquire new knowledge by connecting to previous knowledge already in their memory, which is much easier for the mind to retrieve. Creating a concept map, learners have the ability to create many connections between new ideas and previous knowledge by restructuring knowledge and permanently positioning the new knowledge into their long-term memory. This activity is learner-centered and has cognitive elements that can infuse interest, challenge, and curiosity because it is about learners' mental representation of their own knowledge. Although having students create a concept map can be viewed as a separate learning activity, it is best to nest it within other design aspects. For instance, learners first complete several content reading assignments (content interaction), which might conclude with a discussion forum session with peers (social interaction). Next, they create concept maps followed by instructor corrective feedback (assessment). The instructor feedback focuses on misrepresentations of knowledge.

#### *Virtual Team Project*

This activity can create feelings of excitement, anxiety, frustration, and accomplishment when students are involved in the creation of a product or involved in a process. During the team process, incorporating assessment opportunities in the form of self-reflections at different stages can help students focus on the learning process rather than primarily on product creation. Assessment questions focus on perceptions of their learning by sharing feelings and milestones during the formative stages of the work and giving a sense of accomplishment. Self-reflection can provoke awareness of the emotional and social dynamics of the team and help members rethink strategies for a more effective and efficient process. Instructor feedback should involve encouragement and acknowledgment of team accomplishments or monitoring of progress. It is important for the instructor to avoid prescribing the team process, so that students reflect on their learning process.

#### *Asynchronous Online Group Discussions*

Asynchronous online group discussions may be done in a group setting, but students may view the activity as an individual graded assignment. Group activities in which students focus only on responding to the assignment meet the cognitive dimension but lack the emotional connection among group members. Group discussions that are set up with role assignments can help

build an emotional element into the activity by building group trust and creating social presence. Cognitive elements (e.g., concept relevance, clarity, and understanding) can be easily infused into assessment strategies through a rubric; however, the emotional elements are often left out. Emotional elements can be incorporated into the rubric through contribution to group learning by focusing on collaboration, collegiality, open communication, group cohesion, personal perspective, and emotional expressions. Instructor immediate and regular feedback on the activity can remind students of their contributions to group learning and encourage interest and cooperation.

### *Embed Assessments and Feedback Into the Learning Experience to Promote Engagement and Deep Learning*

Stealth assessments involve embedding formative assessments into the online learning environment. This type of assessment is invisible and does not disturb learning and engagement and may alternate between topics and have different purposes: improve student learning, promote student self-efficacy, offer timely feedback, provide information at different levels of the learning process, furnish low-to-mid-stakes assessments, and use developmental models (Shute & Kim, 2014). Stealth assessments require an integrated approach for bringing together design aspects to create a holistic learning experience. Using digital technologies, assessments can be easily embedded into content interactions, learning activities, and social interactions. Examples of learning activities that can embed assessments and feedback to promote engagement and deep learning include quizzes, case scenarios, problem-based learning, and gamified assessments.

#### *Quizzes*

Quizzes can be embedded easily into content interactions, learning activities, and social interactions. Orientations are usually included in the beginning of the course. Instructors like to gather learner characteristics and prior knowledge during orientation activities; quizzes can be used as a preassessment tool to identify gaps in student knowledge. To test understanding of concepts, quizzes can be embedded immediately after content interactions as learning aids for future retention of knowledge. Quizzes may also be used to help organize information in categories at certain points in the interaction with content to allow better retrieval. When the goal is for learners to apply knowledge to new contexts, quizzes can be embedded using a case example with complex questions evoking decision-making. Quizzes may also be embedded as a self-assessment of knowledge to enhance metacognitive awareness (Roediger et al., 2011). Embedded assessments in a quiz format

can be best used as disguised knowledge checks interwoven between content presentations to engage learners with the content and encourage deep learning.

### *Scenario-Based Activities*

Scenario-based learning activities include story-like narratives of authentic situations likely to be encountered in real-world professional practice. New digital tools enable instructors to craft interactive media-rich scenarios delivered online where individual learners are called on to apply discipline-specific knowledge and skills. Interactive scenarios can function as assessment tools that include critical decision points (in the narrative) where learners are called on to make informed choices demonstrating their application of course content. Using software applications, consequential feedback can also be included in scenarios. Scenario-based learning assessments typically have a story-like look and feel, with contextualized assessment questions framed around real-world challenges. Because of this, they have the potential to engage learners at deeper cognitive and emotional levels compared to traditional assessment formats. Scenarios can present knowledge application questions with multiple acceptable answers, where learners must not only describe their responses but also justify them. In this circumstance, rubrics may be needed to establish criteria for assessment purposes. A blended assessment approach incorporating scenarios can also be used. For example, factual and conceptual knowledge can be assessed through conventional quiz questions followed by a scenario that assesses application of principles, mental models, or problem-solving strategies (Clark, 2013).

### *Problem-Based Learning*

Embedded assessment can be incorporated into problem-based learning activities for understanding and knowledge application (Jonassen, 2014). If the goal of the activity is deep learning, ill-structured problems tend to be more complex. Students can construct a response or a product. The use of a rubric to describe performance provides evidence of competence. Another approach for problem-based learning is when students construct the problems and have control of the context. The complexity of the problem has implications for working memory requirements and comprehension. Complex problems impose more cognitive load on the learner. Instead of viewing the assessment as a knowledge test, embedding assessments like quizzes to check on knowledge application can create excitement for solving the problem, which promotes engagement in the activity and ultimately involves the learner in deep learning.

### *Gamified Assessment*

According to Kapp et al. (2014), *gamification* is “using game-based mechanics, aesthetics, and game-thinking to engage people, motivate action, promote learning, and solve problems” (p. 54). It does not mean that an instructor or course designer must create a game for the course; rather, they create activities that feel like a game. There are two types of gamification: structural and content. Structural gamification applies game elements but does not modify content; the structure around the content is designed based on a game format, but it is not a game. Through stories using characters, students can solve problems by achieving different levels of accomplishment. The content in this format motivates learners through the use of rewards such as badges, achievements, or levels of accomplishment. Content gamification is more like a game; it uses challenges to engage learners in the context; it involves some action to motivate learners to complete an activity. One example of game-like activity is when learners are challenged to an activity that goes throughout the course; they receive badges after completing different levels of accomplishments. The activity builds on skills and promotes deep learning.

### *Involve Learners in Assessments and Feedback to Spark Interest and Sustain Motivation*

Conventional design practices develop assessments from the instructor perspective. It is an individual process in which the instructor determines the criteria, standards, and format or assessment activities. In this case, students are not involved in design decisions. When the course is designed in collaboration with other stakeholders, the course will more closely meet the learning needs of students. Involving learners in continuous participatory design can be accomplished during the course as part of a learning activity in which learners create assessment strategies during projects or through learner feedback on course design as touch points during the course to check how the course design is working for all.

### *Assessments Created by Learners*

Student involvement in assessment creation can be incorporated into team projects or self-directed learning activities. An example of a learner assessment creation involves a team project in which students create questions for a product review. Questions are initially used for a prototype review and then later for a product review. Student involvement in assessment creation is particular to the project and requires students to think more globally. A common self-directed learning activity involving learner assessment-building is a learning contract. A learning contract is an agreement negotiated between

a learner and the instructor identifying the goals and activities of a specific task or an entire course. Students create the goals, activities, assessments, and evidence of accomplishments. These two types of assessment created by learners give them power to take the initiative to identify their own activities and assessments and can spark interest in accomplishing tasks. The instructor role is to monitor student development, growth, and achievements through constructive feedback and recognition of student work.

### *Learner Feedback on Course Design*

Formative feedback on course design can play an important function in sustaining student motivation. Feedback can be obtained weekly during virtual office hours with a purpose or midsemester evaluations in the form of surveys asking questions that convey feelings and perceptions of the learning environment and course activities. Virtual office hours can start with an open discussion about the course interface and structure, examination of technology features, and assignment expectations. Then, move to a more specific focus on assignments to check for student understanding of concepts. Students feel good when they have something to say about modifying the online learning environment. Participatory design gives learners agency and uses a feedforward approach, the ability to know ahead of time if the course is on track. When learners are involved in the design process through feedback, they are more invested, motivated, and interested in the learning process.

### *Include Iterative Self-Assessment Approaches to Encourage Self-Regulated Learning*

Online learning is an iterative phenomenon and requires strong time management skills, self-motivation, and self-regulation. A course that includes self-assessments as part of the iterative learning process helps students control the pace of their learning and has a positive effect on students' self-regulated learning and self-efficacy (Panadero et al., 2017). Self-assessments can help learners become aware of their learning goals and how to monitor and evaluate their own performance. Self-assessments can be incorporated immediately after a task as a reflection of one's personal learning process or accomplished upon receiving instructor feedback to reflect on errors and ways to resolve mistakes.

### *Self-Assessment Immediately After a Task*

One example of a self-assessment conducted after a task is when students construct concept maps and self-assess their learning immediately after completing the task. This self-assessment includes reflecting on relationships

among concepts not seen before, easiest relationships among concepts depicted, most difficult relationships depicted, and reasons these relationships were easy or hard to depict. Further reflection includes looking at the concept map and thinking back on the online discussion and reflecting if there were relationships between the concepts read and the online discussions, moments in the online discussion students felt disoriented or confused and, if so, whether the construction of the concept map provided any clues about why they felt this way. These iterative self-reflections based on students' perceptions and attitudes toward their individual construction of knowledge allow students to refine and expand their knowledge and construct personal meaning (Conceição et al., 2009). Often students redo their concept maps after the self-reflections because the self-assessment of their own work elicited change in their learning. By cycling back through self-reflections of their learning process, students expand their knowledge and increase their self-regulatory actions.

#### *Self-Assessment Upon Receiving Instructor Feedback*

Another example of iterative self-assessment is when students receive feedback on an assignment and the instructor allows students to reflect on components of the assessment that contained errors, provide new solutions for the errors by stating what was incorrect, or state how the solution can be solved in a different way. This type of self-assessment allows students to learn from mistakes and is iterative because the learner loops back into what they did and evaluates their own performance. It gives learners a second chance for looking at their own work, promotes self-efficacy (Panadero et al., 2017), and helps with metacognitive awareness and tuning of schemas.

### **Exploring New Approaches for Assessments and Feedback**

Assessments and feedback best meet mental, emotional, behavioral, and social learning needs if they are designed from a learner perspective as part of the entire learning experience. Students who focus on assessments and feedback as part of their holistic experience will be more motivated and engaged with content and other course activities. This requires a shift in students' mindset. Instructors and course designers who intentionally integrate assessments and feedback need to focus on creating flow and engagement, monitoring learner self-knowledge, leveraging learner experience, sustaining learner motivation, and encouraging learner agency. Spacing and interleaving assessments within content interactions, learning activities, and social interactions can create

flow and engagement and ultimately promote deep learning experiences. Involving learners in assessments and feedback can spark interest and sustain learners' attention and motivation. When exploring and developing new approaches, instructors and course designers need to consider new digital technologies and pedagogies as resources for enhancing the quality of online assessments and feedback strategies.

