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Experiential Learning Assessment: A Dive into the Literature

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Abstract: Experiential learning, which emphasizes gaining new skills, knowledge, and perspectives through experiences, has become one of the most influential models for transforming students' learning and development in a variety of contexts from academic settings to workplace training programs. The current body of research on the assessment of experiential learning indicates both the limitations and the possibilities that exist to move beyond those limits. The purpose of this paper is to examine both the theoretical foundations of experiential learning, and the assessment of experiential learning based on the existing literature. We note that there seems to be little attention paid to how to align experiential learning with explicit student learning outcomes. It becomes essential for educators to reframe experiential learning to focus on student learning outcomes. Drawing on the relevant studies, we discuss potential strategies and approaches for future research and practice in assessing experiential learning.

Keywords: *experiential learning, experiential learning theory, learning outcomes assessment*

Introduction

In its simplest form, experiential learning means learning by doing which relies substantially on students' applying knowledge through direct experience. In recent years, there has been a growing interest in integrating experiential learning practices into higher education. Many faculty have experimented with or fully incorporated experiential learning practices into the classroom (Bielefeldt et al., 2011; Huang et al., 2016) and some institutions have promoted the use of experiential learning principles or activities across their campuses (Morris, 2016). For example, experiential learning is closely aligned with High-Impact Practices (HIPs), a set of educational practices identified by Kuh (2008) as being particularly effective in promoting student learning and success (Kuh & O' Donnell, 2013). Many HIPs, such as service learning and study abroad, are grounded in experiential learning principles (Kuh, 2008). Kuh and colleagues have found that participation in HIPs is associated with higher levels of academic achievement, engagement, persistence, and completion, particularly for underserved students (Kuh et al., 2017). Additionally, experiential learning is often part of programs or courses

which formally require clinical practices, internships, or practicums. These programs or courses are often housed in professional or technical schools or programs across different disciplines such as nursing, business, and engineering (Grace et al., 2017; Jamison et al., 2022; Obi et al., 2022).

Once an experiential learning activity or program is completed, what should the student(s) know or be able to do? What kinds of metrics tell us if these activities or programs really make any difference? The answers to these questions affect the design of experiential learning curricula as well as the assessment of student learning. To address these questions, we took a deep dive into the literature on experiential learning and its associated assessments.

This work is part of a larger project, the Grand Challenges in Assessment in Higher Education project. Through this, practitioners and scholars from different institutions collaborate to investigate and tackle the main challenges in the assessment of learning in higher education -- use assessment findings to increase equity, make assessment findings visible, drive innovation, and use assessment findings to make rapid pedagogical improvements (Singer-Freeman & Robinson, 2020; Singer-Freeman & Robinson, 2022; Singer-Freeman, 2023; Garcia, et al., 2021). To encourage faculty to make timely pedagogical improvements based on assessment findings, it is essential to first ensure that the assessment or measurement approaches accurately represent the intended learning outcomes, so that the inferences drawn from the assessment data truly reflect learners' experiences (Gray & Bergner, 2022; Winnie, 2020). This work comes from the Grand Challenges in Assessment implementation team focused on improving the measurement of student learning over time (Singer-Freeman, 2023). The purpose of this article is to develop a synthesis of the assessment of experiential learning in higher education. We start by reviewing how experiential learning is defined and theoretically conceptualized, as this relates to what is taught through experiential learning and how student learning is assessed. We then examine the assessment approaches of experiential learning. Lastly, we discuss the current challenges and future research directions in incorporating meaningful assessment into experiential learning practices.

Definitions

Experiential learning is a holistic educational philosophy centered on the concept that an individual's prior experiences (e.g., their education, jobs, and life events) are instrumental in how they comprehend and integrate new information (Fry, Ketteridge & Marshall, 2009; Kolb & Kolb, 2009a, Kolb & Kolb, 2009b). This approach views learning as a process built on the learner's existing knowledge base shaped by their unique background and perspectives (Dewey, 1938; Kolb, 1984). Meaningful connections emerge when students engage actively with the material through real-world applications, rather than passively receiving knowledge (Boud, Cohen, & Walker, 1993; Moon, 2004). By valuing the totality of a student's prior experiences, this philosophy provides a comprehensive framework for deep, transformative learning (Mezirow, 1991; Kolb & Kolb, 2005).

As an instructional methodology, experiential learning emphasizes students being active participants in their education through practical experiences (Wurdinger & Carlson, 2010). Rather than traditional classroom-constrained learning, experiential learning embraces opportunities on campus, through hands-on projects, within work-integrated programs, and in community contexts as valuable avenues

for students to gain knowledge and skills (Beard & Wilson, 2013; Kuh, 2008). This method values learning that occurs by doing and experiencing, not just listening, or reading. This situates learning in practical, real-world settings (Fenwick, 2003; Schön, 1983).

Drawing from definitions first proposed by Dewey (1938), Lewis and Williams (1994) describe experiential education as immersing learners in an authentic experience followed by thoughtful reflection. These reflections are a key component of experiential learning, and their purpose is to facilitate the development of new skills, attitudes, and cognitive patterns in the learners. Critical reflection allows learners to draw connections between experience and conceptual knowledge (Ash & Clayton, 2009; Coulson & Harvey, 2013). Models like Kolb's (1984) experiential learning cycle present this pattern of concrete experience followed by reflection. This reflective process is crucial for transforming experiences into learning and facilitating the transfer of knowledge to new situations (Boud, Keogh, & Walker, 1985; Moon, 2004).

We conceptualize experiential learning as a learning process that leverages prior knowledge, situates learning in real-world contexts, utilizes concrete hands-on experiences, and emphasizes critical reflection to allow learners to transform experiences into deeper understanding. This learner-centered approach focuses on the individual construction of knowledge through both doing and reflective observation.

Theoretical Foundations

Experiential education is grounded largely in constructivist learning theory, which proposes that learners construct knowledge and meaning through active experience and reflection (Piaget, 1936; Bruner, 1961). This aligns with experiential education's emphasis on learning by doing and making sense of new information by building on prior knowledge (Kolb & Kolb, 2005; Merriam & Bierema, 2013). The pragmatic focus on applying knowledge also comes through in experiential approaches (Dewey, 1938). Pragmatist thinkers promote learning through real-world problem solving and hands-on experience (Beard & Wilson, 2013; Wurdinger & Allison, 2017). Humanism also influences experiential methods through its focus on student passion, engagement, and self-directed learning (Rogers, 1969; Maslow, 1970).

Critical pedagogy (Freire, 1968) and situated cognition theories (Brown et al., 1989) further shape experiential education. Critical pedagogy suggests that reflection allows students to challenge assumptions and develop critical consciousness by analyzing power structures (Freire, 1968). Situated cognition proposes that knowledge is developed in context through activity (Brown et al., 1989). Experiential methods apply this by situating learning in practical settings. Additionally, experiential approaches draw from brain-based learning research emphasizing the role of active engagement in forming neural connections (Caine & Caine, 1991).

Table 1

Key Theoretical Foundations Underlying Experiential Education

Theory	Core Ideas	Connection to Experiential Education
Constructivism (Piaget, 1936; Bruner, 1961)	Learners construct knowledge by building on prior experiences and mental models	Aligns with the focus on learning through hands-on experiences and reflection
Pragmatism (Dewey, 1938)	Learning occurs through real-world problem solving and application of knowledge	Promotes learning by doing and learning through experience
Humanism (Rogers, 1969; Maslow, 1970)	Learner passion and engagement are motivational forces; self-directed learning	Focuses on student-centered methods tailored to interests
Critical Pedagogy (Freire, 1968)	Critical reflection allows learners to challenge assumptions and power structures	Reflection on experiences can develop critical consciousness
Situated Cognition (Brown et al., 1989)	Knowledge develops in authentic contexts through activity	Situates learning in real-world settings
Brain-Based Learning (Caine & Caine, 1991)	Active experiential methods promote neural connections and deeper processing	Provides cognitive science evidence for benefits of hands-on learning

Models of Experiential Learning

Several scholars have proposed models for describing experiential learning. Dewey (1938) was an early proponent of learning through hands-on experience. He emphasized that for education to be impactful, students must actively engage with their environment. Rather than passive reception of information, he advocated that quality learning stems from experiences that connect to students' prior knowledge and future growth. In Dewey's (1938) view, effective educational experiences involve ongoing interaction between the learner's unique perspectives and the lesson context. By building continuity within students' development and aligning instruction with their needs, educators can motivate continuous, lifelong learning. The key is crafting experiences where students do more than absorb information -- they integrate new concepts into their existing knowledge frameworks through hands-on, contextualized activities. Dewey (1938) envisioned education as an interactive process of experience, reflection, and growth. Another early model, associated with Lewin (1944), emphasizes the

importance of reflective tension between concrete experiences and abstract concepts. Lewin (1944) proposed that optimal learning occurs when students are faced with contradictions between hands-on experiences and theoretical frameworks and are given space to work through these tensions collaboratively. Lewin (1944) advocated for facilitating opportunities that allow students to engage in problem-solving, share feedback, and learn from each other's subjective perspectives. His approach centers on active reflection and peer-to-peer dialogue to make sense of discrepancies between real-world observations and classroom lessons. By encouraging students to deconstruct and resolve the friction between experience and theory, Lewin (1944) highlighted the value of learner-driven knowledge construction and collective meaning-making.

The most cited model of experiential learning is perhaps Kolb's Experiential Learning Cycle (Kolb, 1984). Kolb's (1984) experiential learning model outlines a cycle of four stages through which students continuously progress. The cycle begins with having a tangible, hands-on experience. Students then observe and reflect on that experience. Next, they conceptualize theories and ideas based on their reflections. Finally, students actively experiment with these concepts, which leads to new hands-on experiences, restarting the cycle. His model builds on earlier experiential learning cycles proposed by Lewin (1944) and explicates the specific stages of such learning. Additionally, Joplin (1981) proposed a five-stage model of experiential learning: focus (preparation stage), action (an experience), support (individual or group reflection), feedback (group sharing, feedback), and debrief (analysis and synthesis). The Reflective Cycle Model, proposed by Gibbs (1988), emphasizes the role of reflection in the learning process, consisting of six stages: description, feelings, evaluation, analysis, conclusion, and action plan.

In addition to experiential learning models, other approaches like Project-based Learning (PBL) have been explored as dynamic classroom techniques (Blumenfeld et al., 2000). In PBL, students tackle hands-on projects that involve real-world, authentic problems and challenges. Through this process of actively investigating and addressing complex issues, students gain deeper knowledge and understanding of the material (Blumenfeld et al., 1991; Markham, 2011). The projects drive the learning, allowing students to apply their knowledge and skills to real situations, developing critical thinking, collaboration, and problem-solving abilities along the way.

Place-based education (Sobel, 2004) immerses students in hands-on learning experiences grounded in the local community's heritage, culture, geography, and resources. This approach uses students' own surroundings, from nearby landscapes to community issues, as a meaningful context for engaging with subjects across the curriculum. By basing instruction in local phenomena and student experiences, place-based learning aims to spark students' interest while deepening their connections to and understanding of the community. It provides an experiential foundation for studying traditional subjects, with local cultures, narratives, and ecologies forming the curriculum (Sobel, 2004).

Service Learning (Bringle & Hatcher, 1995) is another model that intentionally connects real-world community service experiences to academic learning objectives and concepts. In Service-Learning programs, students participate in their local community through voluntary service activities intentionally designed to meet the learning goals of a particular course. For example, students in a nutrition course may volunteer at a food bank, while students in a public policy course may volunteer

with a local government agency. The key is identifying service experiences directly related to the academic curriculum. After the hands-on service experience, instructors lead structured reflection activities and discussions, helping students recognize connections between their concrete experiences and the more abstract conceptual knowledge from the course. This reflective process is meant to deepen students' understanding of course material and enhance their sense of civic responsibility. Using community volunteer work and guided reflection, service learning adds depth to traditional classroom instruction by bolstering its personal relevance to students.

Kolb's (1984) cycle aligns with Dewey's (1938) model of learning through hands-on experience and reflection. Place-Based Education (Sobel, 2004) expands student learning into the local community. Project-Based Learning (Blumenfeld et al., 1991; Markham, 2011) facilitates deeper knowledge through collaborative, real-world projects, which dovetails with Service Learning (Bringle & Hatcher, 1995) that connects students with community service projects. Models like Joplin's (1981) and Gibbs' (1988) emphasize the importance of reflection in tying experience to knowledge.

Table 2

Models of Experiential Learning

Model of Experiential Learning	Sources of Knowledge/Description	Example Assessment Practices
Kolb's Experiential Learning Cycle (Kolb, 1984)	Concrete experience, reflective observation, abstract conceptualization, active experimentation	Reflective journals, papers analyzing experience, projects applying concepts
Dewey's Model (Dewey, 1938)	Impulse, observation, knowledge, judgment	Reflective essays, concept maps, debates
Lewin's Experiential Learning Model (Lewin, 1944)	Concrete experience, observations, reflection, abstract concepts, testing	Observation and reflection logs, concept maps, transfer tasks
Joplin's Five Stage Model (Joplin, 1981)	Focus, action, support, feedback, debrief	Self and peer evaluations, facilitator feedback forms, debrief analyses
Gibbs' Reflective Cycle (Gibbs, 1988)	Description, feelings, evaluation, analysis, conclusion, action plan	Reflective journals, learning logs, self-assessments

Place-Based Education (Sobel, 2004)	Local cultures, landscapes, resources	Project reports, community presentations, cultural competency rubrics
Project-Based Learning (Blumenfeld et al., 1991)	Real-world projects, products, presentations	Project rubrics, prototypes, presentation assessments
Service Learning (Bringle & Hatcher, 1995)	Community service, reflection	Reflection journals, project impact reports, site supervisor evaluations

Assessment Practice

Assessment of experiential learning presents unique challenges because the learning outcomes -- especially those that are more affective or metacognitive -- may be difficult to define ahead of the experience (Burch et al., 2019; Coulson & Harvey, 2013). Further, an emphasis on process rather than predetermined outcomes means students may emerge from the same experience having learned different things (Moon, 2004; Yates et al., 2015). As such, the individualized nature of experiential learning provides students with the possibility to determine how their work should be assessed and to create their own assessment criteria (Heinrich & Green, 2020). Assessment strategies must, therefore, take these aspects into consideration.

Assessment of Cognitive Development

Studies investigating the effectiveness of experiential learning have used various means of assessing learners' cognitive development (Burch et al., 2019; Yorio & Ye, 2012). One practice is to use established, validated, and empirically supported measures or instruments. For example, Wang and Rodgers (2006) examined the cognitive development outcomes of various service-learning courses using the Measure of Epistemological Reflection (MER; Baxter et al., 1985), a paper-and-pencil instrument designed to measure respondents' level of cognitive complexity regardless of course level or subject area.

Osborne et al. (1998) investigated the effectiveness of the service-learning approach on a sample of undergraduate students enrolled in a pharmacy program at a small-sized Midwestern university. Out of the four sections of a pharmacy communications course, two were randomly assigned to include a service-learning component at hospital- and clinic-based pharmacies, while the remaining two involved a traditional laboratory project. Several conceptually distinct, established measures were used to assess different aspects of students' cognitive development: a) the Rosenberg Self-Esteem Scale (Rosenberg, 1965): one commonly accepted measure for global self-esteem, b) the Cognitive Complexity Scale (Allen et al., 1990): the extent to which an individual considers multiple possible explanations for others' behaviors, c) the Texas Social Behavioral Inventory (Helmreich & Stapp, 1974)

which emphasizes the perceived self-worth in social situations, and d) Remote Associates Test (Mednick & Mednick, 1971) for assessing creative thinking. Here, the determination of what to assess and, correspondingly, how to assess, was based upon what to train. In addition to the content knowledge and clinical skills of delivering pharmaceutical care, the course instructor uncovered a set of attributes and values expected from future educated professionals in the field including personal awareness, cognitive complexity, social competency in interacting with diverse others, and creative problem solving. In this study, the researchers employed a two-phase design, using pre- and post-tests to administer the measures at the start and end of the semester.

Besides directly using established measures, practitioners and researchers of experiential learning also developed relevant rubrics to assess students' cognitive development (Morris, 2020). For example, Collins et al. (2016) explored how students developed the skills to solve ill-structured problems through a semester-long outdoor leadership development course. Building on the insights from the problem-solving studies, the researchers created and applied a rubric designed to track students' skill development throughout the process of solving ill-structured problems, which consists of five stages: a) Representing the Problem (RP) – assessing students' capabilities to define and locate relevant information from the initial problem, with a maximum score of 10 points; b) Developing Solutions (DS) – assessing students' skills to come up with quality solutions for the problem presented, with a maximum score of 8 points; c) Making Justifications (MJ) – assessing students' skills to offer arguments and evidence to support their solutions, with a maximum score of 7 points; d) Monitoring and Evaluating (ME) – assessing students' skills to evaluate their solutions and relevant alternative possible solutions, with a maximum score of 7 points; e) Problem-Solving Stages (PS) – assessing students' skills to articulate their learning in the problem-solving process to others, with a maximum score of 7 points. In essence, creating such rubrics simplified the complex problem-solving process into manageable steps that could be better understood and assessed.

Assessment of Content Knowledge

Extant literature relies primarily on two different approaches for assessing the content knowledge gained from courses or programs with experiential learning activities (Burch et al., 2019; Yorio & Ye, 2012). One is using objective measures such as grade point average, percentage of correct answers on a quiz or exam, and the evaluation of learning outcomes from a trained third party (Burch et al., 2019; Yorio & Ye, 2012). For example, in a senior-level maintenance management course, a requirement for the Mechanical Engineering program at a university in Chile, a key learning objective was that students should be able to design a maintenance strategy for an industrial facility using objective criteria (Pascual & Uribe, 2006). This course incorporated a range of experiential learning practices, including project-based learning centered around applied problems, role-play wherein the course instructor functioned as an operations or general manager of a company and the students acted as the engineers, and site visits to actual industrial plants or facilities. Each student team's final presentation provided a comprehensive assessment of both content knowledge and other professional skills. Furthermore, the assessment involved evaluations by external content experts. Maintenance engineers were present during the final presentation and completed a survey to evaluate students' level of content knowledge

such as the applicability of the proposed maintenance strategy or model, as well as other professional skills (e.g., communication skills). This external evaluation by practitioners was effective in assessing students' content mastery within a professional context and provided valuable insights for future curriculum improvement (Pascual & Uribe, 2006).

The other approach uses subjective measures such as students' self-assessment of learning or other qualitative feedback to assess learning outcomes. This approach has been widely used as many forms of experiential learning such as field trips and studying abroad are not typically part of the required curriculum. For example, students participating in these experiential learning activities are typically only required to complete a reflection to fulfill the learning requirements (Breunig, 2005; McCarthy & McCarthy, 2006). By nature, reflection or self-assessment of learning outcomes tends to be subjective or personal. Thus, a challenge emerges as it is difficult to use what students provided in their reflection or self-assessment to gauge the effectiveness of the learning experience.

Assessment of Durable Skills

Durable skills are those skills key to students' success beyond college, such as teamwork/collaboration, interpersonal skills, communication, tolerance for uncertainty, etc. (Burch et al., 2019; Morris, 2020). Besides developing cognitive skills or acquiring content knowledge, the role of experiential learning in cultivating durable skills has been well recognized (Burch et al., 2019; Morris, 2020). To date, the assessment of durable skills gained from experiential learning has relied heavily on qualitative approaches such as self-reflection and peer feedback. For example, Murphy et al. (2017) used an ethnographic approach to examine the experiences of 64 freshmen enrolled in an experiential learning-based occupational therapy program. Qualitative coding was conducted to analyze students' written comments to open-ended questions about the key challenges and benefits of experiential learning. The themes suggested students' development of durable skills including an awareness of active listening and effective communication skills. In another study of experiential learning activities within the classroom setting, Vogler et al. (2021) analyzed students' responses to essay questions administered at the beginning of each semester and those from the final exams. The results suggested students' ability to recognize complexity improved as did their capacity to incorporate evidence instead of anecdotes to support their claims. The Team-Based Learning (TBL) literature offers many examples and tools for using peer feedback to assess durable skills gained through experiential learning (Burgess & Matar, 2020). For experiential learning activities involving teamwork, students often complete a peer feedback form as part of the process. For instance, a peer feedback form could prompt students to provide substantive and specific comments to their teammates regarding different aspects of teamwork, such as collaboration and interpersonal skills. Inevitably, both self-reflection and peer feedback introduce a level of subjectivity in assessment. In practice, it requires instructors to a) establish student expectations early, b) collaborate with students to create assessment dimensions, and c) support students in practicing reflection and giving constructive feedback (Cestone et al., 2008).

Assessment of Student Learning Outcomes and Process of Learning

Much of the published literature emphasized anecdotal stories and perceptions of effectiveness related to the experiential learning process (Anderson & Lawton, 1997; Burch et al., 2019). Most were

smaller scale studies or reports from individual classroom practices (Anderson et al., 2016; Donnelly, 2009; Jenkins & Clarke, 2017). Few of these studies connected student learning outcomes to the experiential learning process, resulting in a lack of evidence supporting the use of experiential learning methods to enhance student learning (Burch et al., 2019). Kolb's (1984) model is built on reflection, and as such, previous publications have frequently summarized or analyzed students' reflections on their learning (Carr & Carmody, 2006; Tiessen, 2018; Veine et al., 2020). However, assessing learning outcomes through student reflections is challenging (Burch et al., 2019; Quinn & Shurville, 2009; Sumsion & Fleet, 1996).

There appears to be a mismatch in assessing experiential learning as many educators will assess in a way that is comfortable for them and rely on more traditional modes of assessment (papers, exams, etc.) rather than creating assessment strategies that are aligned with experiential learning and the expected learning outcomes (Boud et al., 1993; Burch et al., 2019). Yates et al. (2015) noted this gap based on extant literature, as well as their own study, where course assessment methods did not align with the specific forms of experiential learning implemented. They indicated that this discrepancy arises from differing philosophical beliefs and assumptions related to traditional and alternative assessment methods. We speculate that one possible explanation for this gap could be the amount of time required to create and implement assessments that are better suited for experiential learning. It is plausible that designing and incorporating assessments such as case-based exams, practical performance tests, and presentation evaluations requires considerably more effort than traditional assessment methods (e.g., multiple-choice exams).

Several studies have used an assessment approach based on Kolb's (1984) experiential learning. For example, Cathro, O' Kane, and Gilbertson (2017) conducted a study wherein they developed a rubric to assess student journal reflections based on Kolb's (1984) learning cycle. In their rubric design, they used the four elements of Kolb's learning cycle -- concrete experience, reflective observation, abstract conceptualization, and active experimentation -- as a framework to analyze student learning for each identified learning outcomes -- group dynamics, cultural sensitivity, enabling technologies, interpersonal communication style, and leadership style. They developed codes to assist in analyzing student journal reflections. While this is a promising example of how to connect experiential learning assessment with student learning outcomes, the time commitment needed to develop and implement this level of assessment lacks feasibility for most faculty.

Assessment Practices in Time- and Resource-Limited Environments

Assessment professionals might encounter limitations in time and resources when evaluating experiential learning. While experiential learning emphasizes hands-on, reflective, and contextualized processes, the assessment practices must balance depth with feasibility. Researchers and educators have used tools (e.g., the VALUE rubrics) to assess students' transferrable skills including critical thinking, lifelong learning, teamwork, and integrative learning (Association of American Colleges and Universities, 2019; Finley, 2019; Rhodes & Finley, 2013). For instance, the VALUE rubric designed for critical thinking can be applied across multiple disciplines, from capstone projects to service-learning activities. By using established rubrics, assessment professionals can save significant time while

ensuring consistency and reliability. Further, work products such as self-reflection journals, portfolios, essays, reports, and presentations allow students to reflect on, analyze, and describe what has been learned from the experience while also providing opportunities for assessment (Ash & Clayton, 2009; Coulson & Harvey, 2013). Reflection prompts, for example, can guide students to analyze and synthesize their learning experiences in a structured format (Boud et al., 2013). These prompts might ask students to address questions such as: a) What particular knowledge or skills did you develop from this experience? b) How did this experience relate to the concepts covered in class? c) What challenges did you face, and how did you address them? Students' responses can be assessed using the rubrics on key learning outcomes.

Collaboration is another effective strategy for mitigating resource limitations. Faculty can partner with industry professionals, supervisors, or community stakeholders to share the responsibility for assessing experiential learning outcomes. For example, students in internship or clinical settings can receive evaluations from their site supervisors based on the established criteria or checklists. Research has shown that this strategy can promote learner engagement (Otaki et al., 2022) and improve students' theoretical understanding and practical skills (Chang & Huang, 2022). Also, to support time-efficient assessments, institutions can invest in professional development workshops and shared repositories of assessment tools, templates, and examples of best practices. Such institutional support ensures that experiential learning assessments remain meaningful and manageable.

Building Assessments Takes Time

To effectively integrate experiential learning and assess student outcomes, faculty must take time to align course objectives, performance indicators, and suitable assessment methods. Mahajan and Bansal (2023) provided a notable example of how to achieve this within a competency-based program where the learning is assessed based on performance rather than student reflection. Additionally, Whalen and Paez (2022) created the Reflective Learning Framework, based on Bloom's taxonomy, as a tool to assess student reflections in geography and sustainability courses. This framework functions as both a writing guide for students and an assessment tool for faculty. A comprehensive assessment of student learning may require a combination or synthesis of these types of rubrics, depending on the specific context or classroom in which they are applied.

In addition to creating assessments that are appropriately aligned with both expected student learning outcomes and the experiential learning component of a course, another challenge involves training and supporting the use of these assessment methods across multiple sections of the same or similar courses. This is particularly important in programs that utilize field-based experiences or simulations, where multiple experts may be involved in assessing student performance. Developing processes for interrater reliability is important to ensure consistent measurement of student learning.

A direction for future research is to develop and apply psychometrically sound measures that can gauge student learning holistically, over time, and in alignment with contextual needs. As discussed earlier, the assessment of experiential learning entails the assessment of learners' cognitive development, content knowledge, and practical competences. The VALUE rubrics, as a widely

recognized assessment tool in higher education, can be used as a "closing loop" measurement to assess learners' societal, professional, and technical skills, such as civic engagement, communication, and problem-solving (Association of American Colleges and Universities, 2019). However, the VALUE rubrics may not be comprehensive enough to assess the learning outcomes desired in a particular discipline, course, or context and therefore may need to be adapted to local needs (Cooney, 2014). Additionally, the VALUE rubrics, oriented toward integrative and applied learning, can be used to promote reflective practice (i.e., helping students gain a deeper understanding of their own learning) and formative assessment (i.e., enabling both instructors and students to provide feedback throughout the learning experience). By employing the adapted VALUE rubrics multiple times throughout a course, educators can gather insights into the quality of student learning over time, allowing for improved pedagogy in the classroom and beyond. Further research is needed on how to apply the VALUE rubrics in support of continuous learning (Rodrigues & Fekula, 2019) and program development, as well as on how to use the conceptual models of experiential learning to inform rubric design.

As experiential learning outcomes may emerge in the evolving contexts, a reciprocal model that integrates assessment and learning could be another future direction for research and practice. For example, Heinrich and Green (2020) proposed a Design-Instruction-Assessment-Learning remix model, which acknowledges the relationship between experience and reflection, while adapting to learning as it unfolds across different environments and learning processes. This model utilizes backward design planning towards student learning outcomes. It incorporates reflection activities into the assessment process and guides further scaffolding, feedback, and integrated learning. With its focus on iterative design, assessment, and learning, this remix model may offer future opportunities for team-based teaching and learning.

Our discussion on instructor-led and student-led experiential learning suggests another potential area for developing a continuum of experiential learning that enables students to take greater ownership of their learning. Student ownership of learning may include opportunities for students to set their own learning goals, choose learning activities, reflect on their learning strategies, and identify areas for growth and improvement. For example, when assessing experiential learning, students could be encouraged to use question-and-answer strategies, such as asking themselves, "what do I need to change in my work to improve its quality?", "what specific help do I need to make these changes?", "from whom can I get help?", and "what resources do I need?" These questions can inform the next-step plans in learning, helping to close the learning gap (Chappuis & Stiggins, 2002).

Finally, previous research stops short of investigating the impact of experiential learning on academic performance and professional competences (e.g., Adewuyi et al., 2022; Giridharan & Raju, 2016). Longitudinal studies are needed to examine the long-term outcomes of experiential learning, including its influence on learners' career trajectories and overall personal development.

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