INVESTIGATION OF EXPERIENTIAL LEARNING PRACTICES IN K-12 EDUCATION

MARC GOBEIL
University of Saskatchewan

JAY WILSON
University of Saskatchewan

THOMAS YATES
University of Saskatchewan

ALEC AITKEN
University of Saskatchewan

KEVIN LEWIS
University of Saskatchewan

Abstract

Experiential learning is a teaching strategy and theory that emphasizes the individual student's experience in the learning process. This approach critically links education with personal experience, recognizing that students achieve superior learning outcomes through experiential methods. While extensive research has demonstrated the effectiveness of experiential learning, significant gaps remain in understanding how to evaluate and measure its implementation in K-12 settings. Assessment challenges persist in measuring both process-based learning outcomes and the effectiveness of teaching practices. Although experiential learning frameworks exist for higher education and professional development, their application to K-12 education presents unique challenges due to differences in student developmental stages and curricular requirements. Current literature primarily focuses on student progression through experiential cycles but provides limited guidance for K-12 teachers on implementing and evaluating experiential learning methods within standard curriculum frameworks. This research identifies areas for further exploration in K-12 experiential education and provides a foundation for developing practical supports to facilitate meaningful experiential learning in K-12 settings.

Keywords: experiential education, assessment, K-12, critical reflection, Dewey, Kolb, experiential learning model

Introduction

Experiential learning (EL) is a broad category that includes inquiry learning, problem-based learning, land-based teaching, and many other subsets that intentionally place students in an environment where learning occurs through direct experience. While Kolb's (1984) experiential theory laid the foundational framework for understanding learning through experience, more recent developments (Matsuo & Nagata, 2020; Kolb & Kolb, 2018) have further refined these concepts. There is no direct EL connection to K-12 education that demonstrates the specific use or the ability to gauge the effectiveness of EL methods on student learning. According to Burch and colleagues (2019) experiential learning methods have a significant impact on student learning. Their meta-analysis of journal articles, dissertations, thesis articles, and conference proceedings concluded that students experience superior learning outcomes when experiential learning methods are used by measuring their effectiveness using Cohen's d (Cohen, 1988), a statistical measurement that helps determine how substantial the difference is between two groups, in this case, showing how much more effective experiential learning was compared to traditional approaches. Of the 13,626 studies examined, K-12 education was not explicitly mentioned; the literature focused primarily on experiential learning in post-secondary and alternative education settings. Therefore, further investigation specific to the context of K-12 education and the development of theories and frameworks specific to the context of K-12 education is required. There is little published research on the assessment methods associated with experiential learning (Wilson et al., 2018). However, some authors report empirical findings related to learning from experience—specifically that experience can teach a broad spectrum of competencies—raising questions about the experiences through which lessons can be taught (Spreitzer et al., 1997). No systematic K-12 education model for educators of experiential learning exists.

To better understand experiential learning in K-12, this research aims to provide insight from educators on their facilitation of these learning experiences. This paper provides educators with insights into effective experiential learning implementation and assessment methods in primary and secondary classrooms, emphasizing their impact on student learning. The most prevalent experiential learning framework, Kolb's model (1984), was developed for adult learning and fails to consider social relationships, critical reflection, and goals (Matsuo, 2015; Miettinen, 2000). This research aims to support the future development of a new framework of experiential learning by establishing the theoretical foundation for a K-12 education model based on holistic characteristics such as social relationships, critical reflection, and goals. The findings can help develop a framework or assessment tool specifically tailored for evaluating the implementation and effectiveness of experiential education in primary and secondary classrooms. This tool could be used by researchers to study experiential learning outcomes, as well as educators to assess and refine their own experiential teaching practises.

John Dewey, the father of experiential learning, is widely regarded as the source from which all experiential learning frameworks and models originated, beginning with his 1938 book *Experience and Education*. His research establishes a base understanding of the relationships between students and educators and emphasizes the critical reflection of the students' learning experience. While Dewey's theoretical framework remains foundational to experiential learning practices in K-12 education, systematic evaluation of its implementation is notably absent from

current literature. Particularly, research in K-12 experiential learning that includes both a treatment and control group is non-existent. Furthermore, analysis of the assessment methods of experiential education approaches within the K-12 range of experiential assessment does not exist. In contrast, post-secondary focused research has identified 89 studies of experiential learning that included a treatment and control group (Burch et al., 2019). Additionally, no K-12 study mentions specific assessment methods, as Wilson, Yates, and Purton (2018) note, "journals, reports, group projects, presentations, self-evaluation, etc., many courses still rely on traditional assessment formats such as tests and quizzes" (p. 2). In their meta-analysis, Burch et al. (2019) classified the 89 studies under analysis into only two broad assessment categories: objective measures (such as test, scores, and grades) and subjective measures (such as self-reported learning and satisfaction surveys), thus reaffirming the need for additional research that explores assessment approaches and their impact on experiential education.

Kolb's model (1984) has been synonymous with experiential learning across multiple fields. However, his model is controversial as it was initially created to complement the development of the Learning Styles Inventory for the business community (Miettinen, 2000) and may not be suitable for K-12 education. This research will inform methodology for K-12 educators resulting in a more complete understanding of practical, experiential learning methods and assessments that they may wish to incorporate into their courses.

Problem Statement

What is known about experiential learning is its profound impact on student learning. From John Dewey to David Kolb there is no question that experiential learning positively contributes to the students' learning experience. To fully understand K-12 educators' assessment methods in experiential learning, both quantitative measures and qualitative insights are needed, as the latter can capture inherently subjective aspects of experiential education, while the former provides measurable outcomes. Two scales were identified during review: Cohen's d (Cohen, 1988), and John Hattie's scale of effectiveness (Hattie, 2012). Cohen's d is found to be prevalent in peer-reviewed academic journals where Hattie's scale is found to be popular among K-12 educators. Studies using Cohen's d (1988) to estimate and describe the effect of experiential learning on learning outcomes found that EL methods resulted in nearly a half standard deviation higher in their effectiveness (d = .43) when experiential learning pedagogies were deployed (Burch et al., 2019; Kolb, 2014; Kuh, 2008). Burch et al. (2019) employed Cohen's d (1988) to estimate and describe the effect of experiential learning exercises on learning outcomes. This metric allows for reporting the standardized mean difference (Cohen, 1988), and Cohen's d is a standard metric used in meta-analysis (Borenstein et al., 2021).

Figure 1.1 *Cohen's d (Héroux, 2017).*

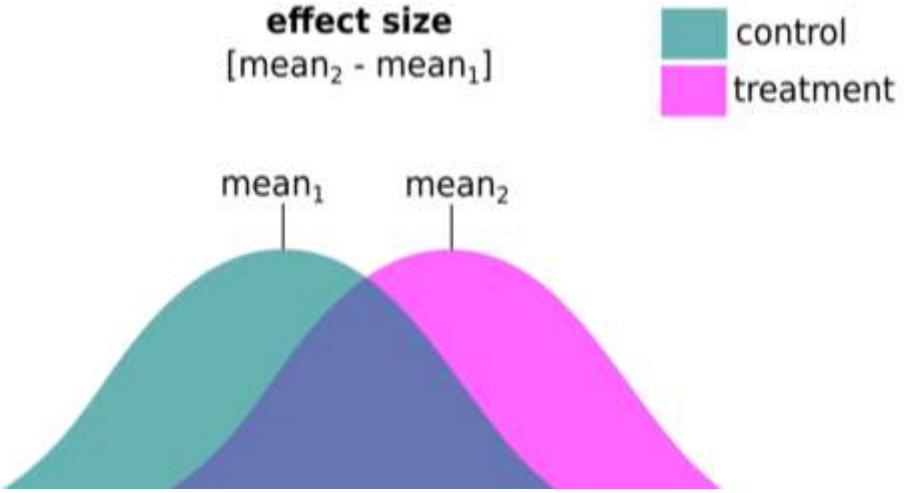


Figure 1.2 *Cohen's d equation (Héroux, 2017).*

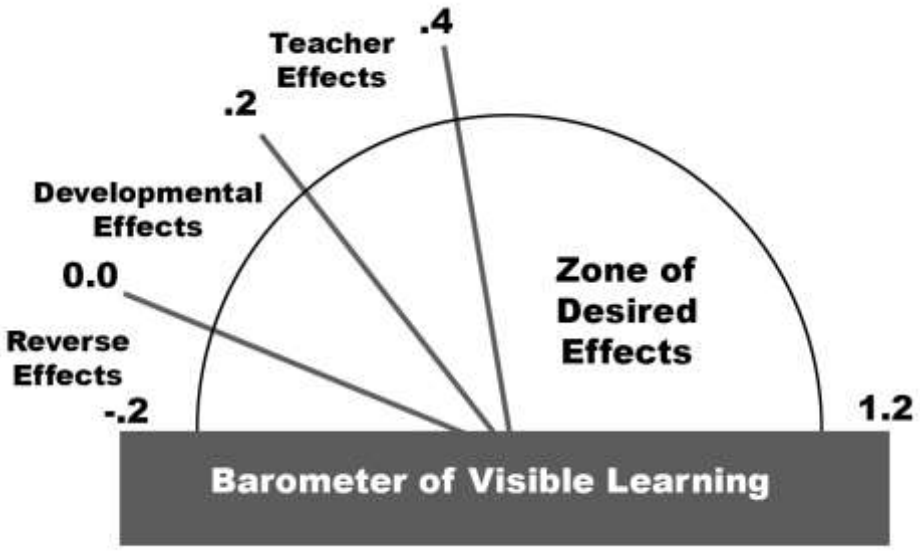
$$\frac{\text{mean difference}}{\text{standard deviation}}$$

$$\text{or} \quad \frac{M_2 - M_1}{\text{pooled standard deviation}}$$

According to Borenstein et al. (2021), Cohen's d is a commonly used metric in research but may confuse K-12 educators who are more familiar with John Hattie's scale of effectiveness from his 2012 book *Visible Learning for Teachers: Maximizing Impact on Learning*. Using Hattie's barometer of effectiveness, the effect size is determined by a meta-analysis of specific factors such as the factor of constructivist teaching resulting in an effect size of 0.64 (Hattie, 2021), or feedback (reinforcement and cues) with an effect size of 0.92 (Hattie, 2021) which means educators who utilize these factors within EL would have the potential to considerably accelerate student learning. In K-12 education circles, John Hattie's research on 'visible learning' and his effect size scale (2012) have both become a widely recognized framework. K-12 educators commonly use Hattie's terminology of 'effect size' to evaluate and discuss the impact of various teaching strategies. His scale has become a practical tool that helps educators, understand and communicate the relative effectiveness of different educational interventions. Although the two scales of effectiveness are similar, the measurement of experiential methodologies with the effect size of (d = .43) results in a medium impact on student learning or "superior" as described by Burch et al. (2019). This analysis achieves a higher rating on Hattie's (2012) scale of effectiveness when deconstructed into the elements that make up EL, specifically constructivist teaching and feedback. Further investigation is needed to determine how

researchers can best utilize these two scales when studying K-12 experiential learning. While Cohen's D is prevalent in academic research and Hattie's scale is familiar to K-12 educators, understanding how to bridge the two measurement approaches could help translate research findings into meaningful guidance for classroom practice. Specifically, examining how Burch et al.'s (2019) effect size findings align with Hattie's visible learning scale could help contextualize experiential learning impacts within a framework that resonates with K-12 Educators.

Figure 1.3 *Adapted from Hattie's barometer of effectiveness (Hattie, 2012).*



What remains unknown is which experiential teaching approaches (such as reflection protocols, hands-on activities, or guided inquiry) most effectively support K-12 students in achieving deeper understanding of learning outcomes. Furthermore, we need to better understand how success and experiential learning could be measured beyond traditional academic metrics, considering factors like student engagements, skill development, and transfer of learning to real-world contexts. When K-12 educators understand why specific experiential learning activities succeed in achieving learning outcomes they can better evaluate and adapt their teaching practices. This knowledge will ultimately strengthen the design of future courses and programs.

Various K-12 educational programs and teaching approaches incorporate experiential learning principles. These include service-learning initiatives, land and environment-based education programs, practical education courses, and inquiry-based learning classes, all of which draw from John Dewey's theories of constructivism and experiential learning frameworks. Experiential learning is active learning where the learner is physically engaged in the process of learning and reflection. As Dewey described in 1938: "Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning results naturally" (p. 45). However, defining experiential learning as a single theory has led to debate in the literature as there are many ways that scholars interpret how students learn. Kolb (1984) stated that learning is "the process whereby knowledge is created through the transformation of experience" (p. 41). Dewey argues that learning comes from transformation from reflecting on the experience (Dewey, 1938). Therefore, it is essential to reframe the experiential learning

debate to focus on learning outcomes. The field of quantitative research regarding assessment methods of experiential learning in K-12 education remains largely unexplored. While notable contributions have been made in qualitative studies, such as Heinrich and Green's (2020) work on experiential learning design and assessment and Nolen, Westfall-Rudd, Ferand, and Drape's (2024) evaluation within agricultural education, a more comprehensive examination of assessment methods is essential to better support educators and students.

Supporting Literature

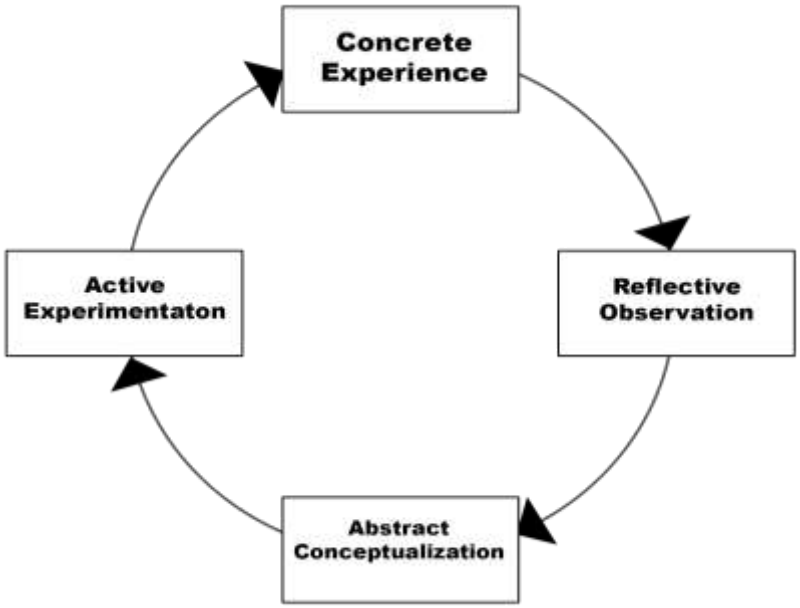
Experiential learning literature frequently identifies John Dewey as its founder, and his 1938 book *Experience and Education* as the fundamental text from which all subsequent theories are derived. It was David Kolb who came up with the first experiential learning theories dating back to 1984. Kolb's work combined Dewey's theory of learning development with the Lewinian Model of Action research and Laboratory Training (Kolb, 1984). Despite the lack of evidence of suitable studies in K-12 education, Burch et al. (2019) provides the basis of research conducted at the post-secondary level in the form of meta-analysis. Presented below is an overview of the relevant theories, studies, and gaps associated with experiential learning literature.

The contemporary conception of experiential learning is based on the work of John Dewey who proclaimed that experiential learning is an essential element of formal education. Dewey (1916) stated that "no experience having a meaning is possible without having some element of thought" (p. 107). His impact on education makes him one of the most influential educational thinkers of the 20th century (Theobald, 2015; Williams, 2017). In the literature and research dating as far back as Dewey's 1938 work, experiential learning has been shown to contribute positively to students' understanding of concepts (Burch et al., 2019; Dewey, 1938; Kolb, 1984; Kuh, 2008).

Kolb's experiential learning theory proposed that we are capable of learning naturally, providing an example of how an experiential learning activity contributes to knowledge construction, transfer, and acquisition. The Kolb model views learning as the internalization of knowledge resulting from personal experiences in particular contexts (Kolb, 1984). It is important to note that Kolb's model is based on his prior work on the Learning Style Inventory (1971). Kolb describes effective learning occurs in four stages:

1. **Concrete experience**: The learner encounters a new experience or engages in a reinterpretation process of an existing experience.
2. **Reflective observation**: The learner reviews and reflects on the new experience and identifies any inconsistencies between experience and understanding.
3. **Abstract conceptualization**: Through the reflective process, the learner creates a new idea/concept or modifies an existing abstract concept – analyzing the concepts and forming conclusions and generalizations.
4. **Active experimentation**: The learner plans and tries out what was learned and can apply the new knowledge to other situations – conclusions and generalizations are used to test hypotheses; thus, the learner engages in new experiences.

Figure 1.4 *The Experiential Learning Cycle, adapted from (Kolb & Kolb, 2018).*



Throughout the four stages of this model, the learner can take any step and repeat the process to acquire new knowledge. For effective learning to occur, the learner should complete each stage of the model, and no single stage can serve as a learning procedure.

Kolb's model is not without its criticism centered mainly on his interpretation of Dewey's original theory of experiential learning. Kolb's model, according to Miettinen (2000), oversimplifies Dewey's original perspective of experiential learning as a lived experience, particularly regarding how the participant makes meaning of their own experiences. The criticism that surrounds Kolb's work on the experiential learning cycle is a continuation of his prior development of the Learning Styles Inventory. The experiential learning model was first created to manage and gain control over one's own learning through the identification of one's learning style (Kolb, 1976a, 1976b, as cited in Miettinen, 2000). The controversy associated with Kolb's model is also intrinsically linked to his work. Kolb's model was identified as being simplistic and epistemologically problematic (Garner, 2000: Greenaway, 2008; Miettinen 2000). Perhaps the most significant critique comes from Garner (2000) who elaborates that Kolb's theory isn't necessarily wrong but rather lacks any coherent foundation and clear links to psychology; thus, it should be used with caution. While early critiques from Garner (2000) questioned the theoretical foundations of Kolb's work, more recent research such as Matsuo and Nagata (2020) offer a revised model that addresses higher-order learning and developing a checklist for debriefing.

Gaps in Existing Knowledge

Only 89 studies included both empirical treatment and control data in the meta-analysis of Burch et al. (2019). Considering the 13,626 articles included in the literary search, 89 studies is incredibly low and identifies a tremendous gap in research concerning experiential learning.

The study by Burch et al. (2019) noted the gap in the literature and lack of research on the topic, noting empirical studies do not often lend themselves well to educational settings despite their obvious importance in promoting experiential learning. This meta-analysis of experiential learning effectiveness indicated no research had been conducted in K-12. Moreover, a meta-analysis data set that only includes assessments conducted objectively or subjectively is limited in its application. To determine which assessment methods engage K-12 students effectively, additional research is needed.

Considerations

Notably absent from teacher training are practical guides and tools in K-12 education for the facilitation of experiential learning, and more specifically, assessments of methods that might be most appropriate for achieving student outcomes.

This paper introduces the concepts and focus of required research to establish a base of methods and strategies used in K-12 educational assessment specific to experiential learning. An essential first step is understanding assessment methods currently used and providing educators with resources and support to select appropriate and effective methods for assessing students' abilities and achievements concerning experiential education. Further research is needed not only to identify which assessment methods may be most supportive of student learning, but also to promote the use of experiential learning in K-12 education. This review has demonstrated a significant need for research in the areas of K-12 experiential learning and specifically the factors which lead to success as outlined in research conducted at the post-secondary level.

Future research in K-12 experiential learning education, particularly studies that compare student outcomes between groups receiving experiential learning approaches (treatment group) and those receiving traditional instruction (control group), will contribute to understanding this area as there are no known studies suitable for meta-analysis. Formative feedback from educators during the experiential learning process, a concept emphasized explicitly by Dewey (1938), was noticeably absent from the research reviewed for this study. Burch et al. (2019) noted that instructor feedback becomes an essential factor for learner motivation but was noticeably absent in how the studies were conducted. Timing of student feedback is a concern for educators as it can be formal or informal; formative and/or summative (Dewey, 1938). Feedback can be applied at different points during experiential learning and for different purposes. The meta-analysis of Burch et al. (2019) relied on Bruner's 1970 definition: “Learning depends on knowledge of results, at a time when, and at a place where, the knowledge can be used for correction” (p. 120). Burch et al. concluded that any feedback received either during the experiential exercise or immediately after will increase students’ learning since people seldom learn from their experience unless the meaning is applied. Feedback is an important area related to assessment that is not evident in any experiential learning study in K-12 education.

Conclusion

Students experience superior learning outcomes when experiential learning methods are used (Burch et al., 2019). A significant challenge in confirming these results in primary and secondary education is the lack of empirical evidence in those areas. Of the 89 studies identified

by Burch et al. (2019) which included a treatment and control group, not one was conducted in K-12 education. The Burch research, although very promising, was limited in its analysis of specific experiential assessment methodology—only categorizing it as either objective or subjective—leaving an incredible opportunity for future research focused on specific assessment methods best suited for experiential learning in K-12 settings. The research revealed overwhelmingly positive learning effects from experiential learning, with the majority of empirical studies documenting substantial student benefits (Burch et al., 2019).

A review of experiential learning models identified Kolb's model (1984) as one of the most influential frameworks for understanding experiential learning. Although designed specifically to promote his work of the Learning Style Inventory, it is insufficient in the areas of feedback and reflection when applied to the context of K-12 education. In Kolb's model, the emphasis is placed on the student passing through all four stages. To effectively support K-12 education, the model should emphasize the educator's critical role in designing experiential learning opportunities that enable students to actively participate and apply meaning through intentional reflection (Nolen et al., 2024). Assessment methods of these experiences should emphasize personal connections and exploration of concepts through frequent and personal feedback from the educator. Successful application of experiential learning methods by K-12 educators could potentially benefit post-secondary instructors, particularly regarding students' ability to reflect and make meaning of experiences. Proper facilitation and resources for experiential learning opportunities which align assessment specific to the context of K-12 education is paramount in supporting educators' continued success and enhancing post-secondary learning experiences.

This systematic review has established the current state of knowledge regarding experiential learning in K-12 education, including identifying critical gaps in our understanding. Building on these findings, several essential questions emerge that warrant further investigation through mixed methods research that values both qualitative and quantitative approaches. Central to future work are two fundamental questions: What are the experiences of educators when choosing experiential learning as a teaching strategy, and how do teachers adapt their assessment methods when implementing new pedagogical approaches. The need to address these questions is paramount for advancing our understanding of experiential learning and assessment practices in K-12 education.

These questions point to the need for research that examines educators' lived experiences with experiential learning while also gathering systematic data on implementation practices and outcomes. Such investigations could address several key questions, including the critical components of effective experiential learning strategies, assessment methods commonly employed, and the specific supports educators need for successful implementation. Additionally, exploring how different variables such as teaching experience, grade level, and subject area influence experiential learning practices and outcomes would contribute valuable insights to this field.

Future research in these areas has the potential to bridge the theoretical foundations established in this review with practical applications that can enhance K-12 experiential learning implementation and assessment practices.

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