

## RESEARCH REPORT

### The Use of Kolb's Learning Styles Inventory (LSI) in School Settings

Fritzgerald Villanueva

#### **Abstract**

*Proponents of learning styles-based instruction recommend using learning styles inventories in school settings. One such inventory is Kolb's Learning Style Inventory (LSI). Critics, on the other hand, discourage the use of such questionnaires because of some challenges associated with learning styles-based instruction. Despite these challenges, learning styles-based instruction continues to thrive because of the proponents' effort to ground learning styles in sound pedagogy. Consequently, the use of Kolb's LSI in school settings is worthwhile.*

The use of Kolb's Learning Style Inventory (LSI) in school settings is a contentious issue in the literature because of the following challenges. First, the meshing hypothesis remains unresolved. This hypothesis states that students learn best from classroom instruction suited to their learning preferences. Second, the question of validity and reliability undermines the questionnaire. Third, the construct of learning cycle oversimplifies the learning process. These challenges offer deep insights into the discourse of learning styles-based instruction. Therefore, addressing these challenges related to the use of Kolb's LSI in school settings is important.

#### **The Unresolved Meshing Hypothesis**

Pashler et al. (2009) commented on the cost associated with the criteria for resolving or refuting the meshing hypothesis. In particular, the criteria require an experimental design, involving a large-scale instructional intervention. However, the projected cost of the design outweighs the benefits of resolving or refuting the hypothesis. As a result, the hypothesis remains unresolved. Critics of learning styles-based instruction, on the other hand, have used the unresolved meshing hypothesis in order to discourage the use of learning styles questionnaires in school settings. Nonetheless, they have shown bias in their results by disregarding the cost associated with the criteria.

Cuevas (2015) disregarded the cost associated with the criteria when he selected for evaluation 31 peer-reviewed articles, including seven correlational studies that administered Kolb's LSI in adult settings. None used instructional intervention, validity test on the questionnaire, and experimental design in order to confirm the hypothesis. Cuevas concluded that the papers lacked quality because none met the criteria, without mentioning the cost associated with the criteria.

Gudnason (2017) cited Cuevas' inconclusive results in order to discourage the use of learning styles questionnaires in school settings. First, she highlighted the unresolved meshing hypothesis. Second, she criticized the association of learning styles with differentiated instruction and inclusive education. Consequently, she discouraged the use of learning styles questionnaires in school settings because of Cuevas' inconclusive results.

These critics of learning styles-based instruction focused more on the problem of unsubstantiated teaching practices in pedagogy. For example, Cuevas (2015) criticized learning styles-based instruction because of its lack of support in the literature. Similarly, Gudnason (2017) criticized Jennifer Katz's three-block model because of its association between learning preferences and multiple intelligences, pointing out that Howard Gardner himself, who innovated multiple intelligence theory, has opposed such association. Having discouraged the use of learning styles questionnaires in school settings, they discussed the confirmation bias

associated with learning styles questionnaires (Cuevas, 2015; Gudnason, 2017). Nonetheless, they showed bias themselves because of their disregard of the cost associated with the criteria, despite their deep insights into the problem of unsubstantiated teaching practices in pedagogy.

The challenge of the unresolved meshing hypothesis reinforces the cost associated with the criteria. Critics of learning styles-based instruction have discouraged the use of learning styles questionnaires in school settings because of the unresolved hypothesis. Without mentioning the cost associated with the criteria, on the other hand, they have shown bias in their results. Consequently, they have misrepresented the unresolved meshing hypothesis in the literature.

### **The Question of Validity and Reliability**

Cassidy (2004) commented on the contentious issue of the construct validity of Kolb's LSI in psychometric research. He also reported the inconclusive results of a few test-re-test studies on the questionnaire's reliability. In contrast, Terry (2001) reported the questionnaire's established reliability in the literature. It is important to note that Kolb (2015) himself reworked the questionnaire over the years in order to improve its validity. Consequently, the question of validity and reliability have undermined the inventory because of such contradictory results in the literature.

Kolb (1981) disputed his critics' contrapositive approach to discrediting the LSI's validity and reliability, offering instead a more standard approach to validating these psychometric properties. Nonetheless, he merely presented a brief overview of the four opposite modes, mentioned a few published papers that already established the questionnaire's validity, and reinterpreted his critics' inconclusive results on the questionnaire's reliability in the context of his own theories. As a result, he expressed bias in his response, despite his use of a more standard approach to validating these psychometric properties.

Kolb followed a more rigorous approach to validating these psychometric properties in his 2015 book. First, he reported his own results on the correlation between the four opposite modes in order to establish internal validity. Second, he analyzed the result of a longitudinal study that compared Kolb's LSI to other learning styles questionnaires in order to establish reliability. Third, he accounted for the bias effect of the questionnaire's forced-choice format through a study that controlled the effect. Fourth, he reinterpreted his critics' inconclusive results on the questionnaire's external validity through a heuristic approach. Consequently, he established the questionnaire's psychometric properties through a more rigorous approach in his 2015 book.

Kolb (2015) focused more on the purpose of the LSI in pedagogy. He argued that the inventory represents the unique learning process of individuals grounded on the constructs of individuality and possibility-processing structure. Furthermore, he described that the questionnaire reflects the "holistic, dynamic, and dialectic" relationship between the four opposite modes. Lastly, he maintained that the primary purpose of the questionnaire is to help students reflect on their own learning preferences. Consequently, he encouraged the use of the LSI in school settings because of its purpose in pedagogy.

Terry (2001) embraced the questionnaire's purpose by proposing learning styles-based instruction that uses Kolb's LSI in adult settings. Terry (2002) also proposed the use of Gregorc's styles delineator. These papers reflect her educational philosophy; that is, she strongly believed that teachers usually self-regulate their teaching strategies based on their own learning styles, but they often adapt willingly, perhaps unconsciously, to their students' learning styles in order to help them achieve success (M. Terry, personal communication, October 30, 2019). As a result, she offered deep insights into the use of learning styles-based instruction in adult settings because of her educational philosophy.

Contrary to Kolb's favourable results, the questionnaire's validity and reliability continue to pose a credibility challenge in the literature. For example, Barry and Egan (2018) highlighted the

continued lack of coherence among psychometricians on the question of validity and reliability of learning styles questionnaires in adult settings, including Kolb's LSI. Consequently, this credibility challenge remains unresolved in the literature.

Challenges to the LSI's validity and reliability emphasize the importance of establishing the psychometric properties of learning styles questionnaires in research. Proponents of learning styles-based instruction have focused on pedagogy, as infused by their own educational philosophy, in order to encourage the use of learning styles questionnaires in school settings. Consequently, they have offered deep insights into the discourse of learning styles-based instruction, despite the challenging questions of validity and reliability in these questionnaires.

### **Oversimplification of the Learning Process**

Kolb identified in his 2015 book six constructive criticisms that influenced his views on experiential learning theory. One of these constructive criticisms was oversimplifying the learning process within the construct of learning cycle. Nonetheless, he circumvented the challenge through an indirect response filled with quotations and personal anecdotes, wherein he consistently referred to pages in the book. Having said this, the challenge offered opportunities to research one of the six constructive criticisms that influenced Kolb's views on experiential learning theory because of his indirect response to the challenge.

Based on his indirect response, Kolb (2015) disregarded the role of unconsciousness in the learning cycle. Furthermore, he dissociated his views on experiential learning theory from Freud's psychoanalytic theory. In contrast, Peterson et al. (2015) explicitly acknowledged the role of unconsciousness in the learning cycle. It is important to note that the paper's authors, one of whom was Kolb, merely inferred the role of unconsciousness in the learning cycle. As a result, Kolb contradicted himself in the paper because he disregarded in his 2015 book the role of unconsciousness in the learning cycle.

M. Terry (personal communication, October 30, 2019) acknowledged an automated mechanism in the unconscious mind ("Freud's Model," 1994-2018) or unconscious mechanism (Papies & Aarts, 2011) that regulates learning disposition (Gray et al., 2014) when she stated her educational philosophy. In particular, she referred to an unconscious mechanism that moves teachers to adapt to students' learning styles. Similarly, in his 2015 book Kolb acknowledged an unconscious mechanism that elicits motivation and self-confidence from prolonged studying. Consequently, these authors inferred the role of unconsciousness in the learning cycle because of their acknowledgement of an unconscious mechanism that regulates learning disposition.

The role of unconsciousness in the learning cycle is suggestive of nonconsciousness self-regulation (Papies & Aarts, 2011). For example, M. Terry's acknowledgement of an unconscious mechanism that regulates learning disposition suggests a construct of self-regulation at the unconscious level (personal communication, October 30, 2019). However, Etkin (2018) defined self-regulation in-terms of consciousness or working memory (Hofmann et al., 2011). These contradictory statements elicit a deep question that Papies and Aarts (2011) explored: How is it possible for the mind to form a goal outside of consciousness? Consequently, the role of the unconscious in the learning cycle offers research opportunities concerning the unconscious mechanism that regulates learning disposition.

### **Conclusion**

The use of Kolb's LSI in school settings is a contentious issue in the literature because of the unresolved meshing hypothesis, problems with the questionnaire's validity and reliability, and dangers of oversimplifying the learning process within the construct of learning cycle. These challenges suggest research opportunities in the discourse of learning styles. Consequently, the use of Kolb's LSI in school settings is a worthwhile endeavour despite these challenges.

## References

- Barry, M., & Egan, A. (2018). An adult learner's learning style should inform but not limit educational choices. *International Review of Education*, 64(1), 31-42. <https://doi.org/10.1007/s11159-017-9694-6>
- Cassidy, S. (2004). Learning styles: An overview of theories, models, and measures. *Educational Psychology*, 24(4), 419-444. <https://doi.org/10.1080/0144341042000228834>
- Cuevas, J. (2015). Is learning styles-based instruction effective? A comprehensive analysis of recent research on learning styles. *Theory and Research in Education*, 13(3), 308-333. <https://doi.org/10.1177/1477878515606621>
- Etkin, J. (2018). Understanding self-regulation in education. *BU Journal of Graduate Studies in Education*, 10(1), 35-39. <https://files.eric.ed.gov/fulltext/EJ1230272.pdf>
- Freud's model of the human mind. (1994-2018). *Journal Psyche*. <http://journalpsyche.org/understanding-the-human-mind/#more-16>
- Gray, G., McGuinness, C., Owende, P., & Carthy, A. (2014). A review of psychometric data analysis and applications in modelling of academic achievement in tertiary education. *Journal of Learning Analysis*, 1(1), 75-106. <https://doi.org/10.18608/jla.2014.11.5>
- Gudnason, J. (2017). Learning styles in education: A critique. *BU Journal of Graduate Studies in Education*, 9(2), 19-23. <https://files.eric.ed.gov/fulltext/EJ1230420.pdf>
- Hofmann, W., Friese, M., Schmeichel, B. J., & Baddeley, A. D. (2011). Working memory and self-regulation. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation* (2<sup>nd</sup> ed., pp. 204-225). Guilford Press.
- Kolb, D. A. (1981). Experiential learning theory and the learning style inventory: A reply to Freedman and Stumpf. *The Academy of Management Review*, 6(2), 289-296. <https://doi.org/10.5465/AMR.1981.4287844>
- Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning development* (2nd ed.). Pearson Education.
- Papies, E. K., & Aarts, H. (2011). Nonconscious self-regulation, or the automatic pilot of human behavior. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation* (2<sup>nd</sup> ed., pp. 125-142). Guilford Press.
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105-119. <https://doi.org/10.1011/j.1539-6053.2009.01038.x>
- Peterson, K., DeCato, L., & Kolb, D. A. (2015). Moving and learning: Expanding style and increasing flexibility. *Journal of Experiential Education*, 38(3), 228-244. Retrieved from <https://doi.org/10.1177/1053825914540836>
- Terry, M. (2001). Translating learning style theory into university teaching practices: An article based on Kolb's experiential learning model. *Journal of College Reading and Learning*, 32(1), 68-85. <https://doi.org/10.1080/10790195.2001.10850128>
- Terry, M. (2002). Translating learning style theory into developmental education practice: An article based on Gregorc's cognitive learning styles. *Journal of College Reading and Learning*, 32(2), 154-157. <https://doi.org/10.1080/10790195.2002.10850295>

### About the Author

*Fritz Villanueva is in his first year of Brandon University's Master of Education program. He is currently a guest/substitute teacher in the Portage La Prairie School Division. His professional goal is to become a reading recovery teacher.*