

Chapter 10

Exploring the Relationship Between Learners' Uncertainty Level and Learning Performance in an Authentic Problem- Based Learning Environment

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ABSTRACT

Many educators believe that learners' learning experience can be enhanced by infusing uncertainty into their learning process. The authentic problem-based learning (APBL) model allows uncertainty to be incorporated into ill-structured problem to motivate learners' learning process. This study looks into the relationship between learners' uncertainty level and learning performance in APBL model which involve participation of 78 engineering students from Taylor's American Degree Program. A questionnaire consists of 30 items of uncertainty construct and 10 items of learning satisfaction is developed to measure learners' uncertainty level and satisfaction at the end of APBL. Learners' learning satisfaction, learning attitude, and learning score on APBL activities which form the learning performance is computed. The Cronbach's alphas for uncertainty construct and learning satisfaction are 0.89 and 0.92 respectively. The zero order Pearson's correlation analysis showed a strong negative correlation between uncertainty level and learning performance.

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INTRODUCTION

The term “uncertainty” has been used in various discipline with different interpretation. In term of teaching and learning aspect, uncertainty is always associated with anxiety, ambiguity and confusion, particularly in the traditional teaching approach where “certainty” is the gold standard of teaching and learning outcome. Thus, educators and students avoid uncertainty as much as they can. The current shift of teaching paradigm to learning paradigm with the student-centered learning approach such as Problem-based learning (PBL) has been increasingly gaining its popularity in the higher learning institutions. The unique feature of PBL is crafting the ill-structured problem/ PBL scenario. The unique feature of PBL is the injection of uncertainty naturally as a source of intrinsic motivation and a stimulus to learning which appears as the natural provocations for real learning. The uncertainty in PBL is originated from the lack of knowledge due to the fact that they are not exposed to curriculum input prior to the PBL question given to them. Students are required to assess what they know and what they do not know, and they are challenged to make decision to fill the gap of knowledge uncertainty in order to construct the new knowledge. This feature in the learning paradigm is very much different from the traditional approach of teaching paradigm where students and lecturers believe that the purpose of teaching and learning is the resolving of uncertainty level and the main resources to close the gap of knowledge and reduce uncertainty are teachers and textbooks.

Today’s university students who have completed secondary education are highly dependent on teachers who spoon fed them with knowledge to reduce uncertainty in learning. Cynthia (2015) reported that today’s learners face a difficult, uncertain and complex future. As such, universities must work to equip learners with the skills they need to confront with new challenges, which can be achieved by presenting ill-structured real-world problems to students before they are taught with the topic or knowledge in PBL approach (Savery, 1995).

LITERATURE REVIEW

Problem-Based Learning (PBL)

Education has long been focused on teacher centered and instructional approach which emphasized on teaching students to provide a correct or definite answer. Student often completes assignments, do well on tests and get good grades; yet, lack critical thinking component (Brooks & Brooks, 1993). Brooks and Brooks (1993) articulated that lecturers too often ask students to recite, define, describe, or list facts. This approach has often allowed students to be passive in the classroom. Students, not knowing how to be active participants in the lecture, have relied on transcription, memorization, and repetition to reduce uncertainty in learning. They perceived this mode of teaching and learning is the best way to reduce uncertainty, as they believe that knowledge consists of right answers and learning is the memorization and reproduction of these answers (Perry, 1970). To them, information seeking is seeking “correct answers” and fact from lecturers and textbooks only. The current educational reform reflects the importance of learning not only to acquire content information, but also emphasizing in generic skills such as critical thinking and digital literacy skills. The phenomenon of “information overload” due to exponential increase in the number of information resources and technology tools available today has put digital literacy skill and critical thinking skills as predominant skills on the part of today’s university

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