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### Comparison of active and passive learning modules and student engagement levels in an online course

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**Aim:** Based on these psychometric findings, the four engagement common factors were used to assess the degree of interest and motivation for graduate students enrolled in an advanced pathophysiology online course. The purpose of the educational intervention was to explore the levels of engagement in two learning contexts: Passive learning modules and active learning modules.

**Methods:** Masters level graduate nursing students answered the 41 questions designed to measure student engagement. Advanced pathophysiology students completed an educational intervention based on a passive learning and active learning experiences for an online course. Learning activities, such as textbook readings, videos and quizzes, were the same for all modules. The differentiation between the active and passive learning modules was in the discussion of the case studies. The case studies are clinical examples of the module content. (a) In Modules 1, 2, and 3 (passive learning), the students simply read the 4 case studies in each module. There was no discussion of the case studies or additional information added. (b) In Modules 4, 5 and 6 (active learning), there was active discussion of the case studies by the students. A student case study presenter was assigned to present each of the 4 case studies in each module and to moderate the subsequent discussion. All students then responded to each case study with a comment, a question, a clinical example or an additional resource (article, website, video, or diagram). A dependent t-test will be used to analyze the four engagement constructs (Physical Engagement, Cognitive Engagement, Deep Learning Engagement, Engagement Skills). Twenty- seven students completed the 41 student engagement question on two occasions (i.e., after completing Modules 1-3, following the completion of Modules 4-6). Below are descriptions of the four engagement constructs or scales. (i) Physical engagement assesses the physical effort exerted on the task. (ii) Cognitive engagement includes questions measuring in-class (on-line) and out-of-class learning. (iii) Deep Learning engagement includes questions measuring higher-order, reflective, and integrative learning. (iv) Engagement skills assesses writing, critical-analytical thinking, work-related knowledge and skills, development of values and ethics, cultural diversity, and real-world problems.

**Findings:** Using SPSS 25, the dependent t-test analyzed the passive and active learning approaches by comparing student responses to the Physical, cognitive, deep learning, and engagement skill factors. First, there was no statistical ( $p=.204$ ) difference between the passive and active learning on the physical engagement factor/scale. Second, there was a statistical ( $p=.019$ ) difference on the cognitive engagement factor/scale. Third, there was a statistical ( $p=.002$ ) difference on the deep learning engagement factor/scale. Fourth, there was a statistical ( $p=.022$ ) difference on the engagement skills factor/scale. These findings demonstrated the students were significantly more engaged while completing the Modules 4-6 assignments.

**Discussion:** On the physical engagement factor, no significant differences were found between the passive and active learning modules which may suggest that students committed essentially the same levels of engagement for both learning approaches. Regarding the cognitive, deep learning, engagement skills factors – students reported higher levels of commitment for the active learning (case study) approach.

**Conclusions:** Burch and colleagues (2014) initiated the quantitative measurement of engagement with the SES 63-item instrument. They recommended the following scales: Physical, Emotional, Cognitive in-class, Cognitive out-of-class, Persistence, Deep Learning IL/RL, Deep Learning Higher Order, & Global Perspective. In an educational intervention with a sample of nursing students, Hilty et al. (2018) found support for four common factors based on the original Burch et al (2014) questionnaire. First, Hilty et al. (2018) found support for the Physical dimension. Second and third, the nursing student sample combined Burch's two cognitive dimensions and joined Burch's two deep learning dimensions. Fourth, Burch et al (2014, proposed a learning activities dimension and recommended the global perspective scale which included some of the original items. Hilty et al. (2018) found support for the original learning activities dimension. Hilty et al. (2018) four common factors contrasted levels of engagement in the passive and active learning modules.