Development of a Survey Instrument to Measure Student Response to Instructional Practices

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Introduction

• Various calls have been made for instructional reform in STEM
• Many innovations in instructional practices have been used in the classroom
• Research-based instructional strategies (e.g., active learning)
• Faculty's adoption of these practices has been slow
• Student resistance can be a major barrier to adoption [1]

New instrument attempts to explain relationship between types of instruction, strategies for using them, and student response

Figure 1. The largest group of faculty (35%) have tried nontraditional teaching methods and then discontinued their use [2]

Elements of Our Protocol

Section 1

• Construct of productive engagement [3]
• Participation (alpha=0.77) vs. Distraction (alpha=0.73) [4]
• Value (alpha=0.67)
• Positivity towards instructor/course (alpha=0.72)
• Overall evaluation of instructor/course (alpha=0.72)

Section 2

• Approaches to reducing student resistance [5, 6, 7]
  - Explanation Strategies (alpha=0.80)
  - Facilitation Strategies (alpha=0.71)

Section 3

• Interactive or dialoguing, Constructive or generating, Active or selecting, and Passive or receiving (ICAP) Model Framework [8]
• Measures of both actual and ideal course experiences (alphas>0.65)

Validation of Protocol

• Reliability and Validity
• Cognitive interviewing with approximately 15 students at 4 institutions
• Pilot testing with 362 students at 4 institutions
• Additional validation through expert review and confirmatory factor analysis

Results

• We have initial results from students' responses to our eight piloted courses
• Six active learning and two traditional (lecture-based) courses were included

Table 1: Confirmatory Factor Analyses for Ideal Types of Instruction

Table 2: Confirmatory Factor Analyses for Student Responses to Instruction

• We conducted EFA on Fall 2014 data and found five factors for student response
• We conducted CFA with same five factors on Spring 2015 data and found all five factors had acceptable construct reliability and factor loadings
• Two survey measures loaded strongly on two different factors (Distraction and Participation)
• We split these items into four different questions to address both constructs

References