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Research article

Validation of the MUSIC® Model of Academic Motivation Inventory for use with student pharmacists

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Abstract

Objective: To assess the reliability and construct validity of the MUSIC Model of Academic Motivation Inventory in a student pharmacist population.

Methods: The MUSIC Inventory was administered via Qualtrics two weeks prior to mid-semester examinations in three required pharmacy courses, representing three distinct cohorts. Cronbach's α reliability estimates were calculated to measure reliability. Exploratory factor analysis was conducted on the overall sample to measure construct validity.

Results: Students returned 154 usable responses (response rate = 75%). Cronbach's α values for the overall sample were close to or above 0.9 for all subscales. Exploratory factor analysis found that the items loaded to five distinct factors. The median completion time across the three cohorts was 119.8 seconds.

Conclusions: These preliminary findings suggest that the MUSIC Inventory may have sufficient reliability, validity, and ease of administration to be a useful tool for pharmacy faculty desiring to adjust their instructional design to maximize student motivation to learn.

Keywords: Academic motivation; Student pharmacists; MUSIC Model; Instrument validation; Exploratory factor analysis

Introduction

The MUSIC® Model of Academic Motivation and Inventory

The MUSIC® Model of Academic Motivation (MUSIC® Model) is constructed from five different factors that influence motivation as described in the literature of educational psychology—eMpowerment, Usefulness, Success, Interest, and Caring.[1] Jones and Wilkins[2] have described each of these factors and summarized the research that demonstrates their role in the motivational process. The focus of the MUSIC® Model that resulted from this synthesis is on the relationship between instructional design and motivation.

The MUSIC® Model of Academic Motivation Inventory (MUSIC® Inventory) is a 26-item self-report instrument that measures student agreement with statements related to the five components of the MUSIC® Model.[1] The eMpowerment subscale is a five-item selection measuring how strongly students believe that they are empowered to learn the course material in their own way. The five items of the Usefulness subscale measure student perceptions of the relevance of the course material for their lives and practices. The four items of the Success subscale measure students' perception of their prospects for doing well in the course. The six items of the Interest subscale measure how well the student feels the course design and material engages their interest. The six items of the Caring subscale measures students' perception of how much the course instructor cares about their success in the course. Student agreement is

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measured with a 6-point Likert-type scale (1-strongly disagree to 6-strongly agree). The MUSIC® Inventory has been validated in a number of educational settings in relation to undergraduates and middle school students.[1–4] Confirmatory factor analysis using results from 1228 undergraduates in three different courses supported the five-factor correlated factor structure of the inventory as a relatively good fit for the model.[2]

Purpose

Currently, there are no studies utilizing the MUSIC® Inventory to measure academic motivation in student pharmacists or other health professions students. Most of the instruments utilized in studies of student pharmacist motivation are focused on student motivation factors with little regard for the role of instructional design in the motivational process. This contrasts with the heavy focus of the MUSIC® Inventory on factors that can be affected by instructional design. If this instrument can be validated for student pharmacists, it could prove useful to pharmacy educators who desire to optimize their instructional design for maximum student motivation to learn.

The purpose of this study is to measure the internal reliability and construct validity of the MUSIC® Inventory across three cohorts of student pharmacists. We hypothesize that the MUSIC® Inventory will demonstrate similar validity and reliability when administered to student pharmacists as it has with undergraduates. We also hypothesize that the results of exploratory factor analysis will yield the five factors identified in previous undergraduate research. To place the study in the context of current practice, a review of the literature of pharmacy education was performed to identify studies related to academic motivation.

Defining motivation

Motivation is defined as a process that instigates and sustains goal-directed mental and physical activity.[1] Learning is an activity affected by the intrinsic and extrinsic motivation of the learner. Intrinsic motivation to learn applies to learning for the pleasure and satisfaction the student derives from the act of learning or knowledge gained.[5] Extrinsic motivation to learn refers to learning as a means to an end. Amotivation, or a lack of motivation, leads to poor performance and the students' questioning of their reasons for their academic pursuits. Motivation is conceived of by the socio-cognitive model as a changing and complex process rather than an inherent trait of an individual student.[6] Motivation is influenced by context, in that students can exhibit high levels of motivation in one setting and a profound lack of motivation in another setting. Research suggests that reduced motivation adversely affects academic performance. Motivation (specifically achievement motivation) has been shown to have a positive correlation with academic success among college students.[7] The Center for the Advancement of Pharmacy Education (CAPE) Outcomes address the importance of motivation in pharmacy education.[8] Example learning objective 4.1.2 states that students should be able to "maintain motivation … during learning and work-related activities." Understanding and measuring student motivation is therefore considered important in pharmacy education.

Motivation to learn and instructional design

Instructional design should include a motivational strategy that can be intentionally used to correct motivational problems in students.[9] A basic framework for developing instructional design that seeks to increase student motivation is—(1) define, (2) design, (3) develop, and (4) pilot.[10] The first step Keller[9] proposes in his systematic approach to designing motivating instruction is to identify motivational problems. In order to properly define motivational problems that may exist, a model that accounts for the various factors that affect the students' motivation must be adopted by the instructor for assessment purposes. Having done so, the instructor should select a method to measure these constructs efficiently and accurately in their students. The instructor is then able to design and implement to correct the problems identified while still achieving course learning objectives. Assessment takes place as a part of the pilot process by use of formative measures of students' achievement of these objectives in addition to further evaluation of motivation.[10]

Measuring motivation in student pharmacists

A literature search of three pharmacy education journals (*American Journal of Pharmaceutical Education*, *Currents in Pharmacy Teaching and Learning*, and *Pharmacy Education*) performed using the keyword "motivation" returned 74 articles. After review of the titles and abstracts of all 74 articles, 15 were found to measure or focus on motivation to learn. This sample is likely to be representative of recent research on motivation to learn in student pharmacists, as all articles were published between 2003 and 2014. The remaining 58 articles were focused on other types of student motivation (e.g., motivation to seek a residency or motivation to use a skill or do a task), faculty motivation, motivational interviewing, and other topics not pertinent to motivation to learn.

In these studies, motivation to learn was measured for following two broad purposes: description of student populations (five articles) and assessment of instructional or curricular design (ten articles). All five of the descriptive studies were designed using a previously validated instrument. Of the articles written for assessment of instructional design, five studies utilized a validated instrument in their methods. Three of the studies used an instrument created for the study by the authors that had not been previously validated (ad hoc instrument). One study utilized a