Training Student Doctors: The Influence of Self, Patient, and Faculty Feedback on Performance

Purpose

Research shows that students do not feel fully prepared for their careers as doctors. This lack of preparation can be stressful. Therefore, real-world preparation is needed to prepare new doctors for the experiences they will face early in their career. Simulations are gaining popularity as one way medical schools prepare students for their medical careers. Simulations provide a realistic situation where students can learn what clinical skills they need to master (Bradley 2006).

Simulations provide valuable real-world experience for student doctors, as do the assessments used to reflect upon and evaluate such learning experiences. Having a valid and reliable assessment for the students' performance in these situations is a key part of the students being able to learn information to apply to their careers (London 2008). This is why analyzing the medical school assessments is important. Research indicates that the best method for assessment has not yet been identified; however, good assessments must have a common standard among schools and must evaluate skills needed in real-life careers (London 2008).

I propose to evaluate three assessments used in student-doctor simulation experiences at the Campbell University School of Medicine (CUSOM). Specifically, I wish to examine the validity of the assessments using an exploratory factor analysis. In other words, do the assessments measure what they purport to measure. In addition, I plan to analyze the extent to which feedback promotes student-doctor learning. I propose to examine the relationship between self, peer, patient (actor), and faculty assessments of student-doctor performance in the simulation experiences. This research is of interest to CUSOM, and they are in support of my proposed project.

Project Narrative

Humans learn through practice and feedback. Simulations support effective learning by incorporating the following elements: practice, multiple types of feedback, increasing experience, anddeveloping necessary skills. However, a key factor in this learning process is being able to identify and effectively evaluate performance. Feedback alerts learners as to what change is needed; therefore, the

assessment needs to be a valid measure of student performance (Mislevy 2011). Assessments have been found to be a motivating factor in student performance (London 2008).

Scholars find that simulations, practice, and feedback supplement lectures to enhance clinical training. Further, multiple times of practice and feedback produce even better learning experiences for students. Simulations that mirror the real world situations improve student performance, and feedback allows students to continue to improve their skills (Bluestone et al. 2013). Miller's theory of clinical practice is used in medical school simulations (Association of American Medical Colleges 2008). Miller's theory has four levels: showing knowledge of the information, knowing how to perform the skill, showing knowledge of the skill in a simulation, and performing the skill in a real clinical setting.

Due to the growing use of simulations in graduate medical programs, it is important to study its effectiveness and how to improve it for students' learning. Scholars call for more research on the best ways to teach and evaluate simulation-style learning (Chakravarthy et al. 2011). For simulation training to be effective, the assessments have to identify the positive and negative aspects of the student's performance. The validity of the assessment is what allows the student to correctly apply feedback to improve their performance (Salas et. al 2009). The Campbell University School of Medicine (CUSOM) has developed a robust simulation and assessment process. However, these assessments need to be scientifically evaluated.

This project would be a next step in a new collaboration between CUSOM and the Psychology department. In fall 2020, Dr. Lunsford led a project to collaborate on health care persuasion for COVID prevention for the new mobile healthcare vans. Mr. Schmid, Assistant Professor of Simulation Medicine, expressed an interest in having the student-doctor simulation assessments analyzed for their validity and predictive power.

In early February, I, along with Drs. Lunsford and Van Allen, were given permission to watch an hour of the student-doctor simulations of patient visits and diagnosis. These simulations are conducted in 'blocks'. There are two patient visits in each block and there are four blocks per academic year. The data collected in these simulations will be analyzed in this project. Patients are trained actors. A block consists of two patient visits as described below.

The first visit is a formative assessment. The visit lasts for 23 minutes, 14 minutes are devoted to the

patient visit and nine of these minutes are for self assessment using the *SOAP* protocol, described below. The student-doctor (s-d) must ask three open-ended questions, obtain the medical history of the patient, physically evaluate the patient, and make a plan and outcome with the patient. Then, the s-d prepares a “SOAP" Note, which consists of these four elements: a) subjective evaluation of the patient, b) objective evaluation of the patient, c) assessment for the patient, and d) plan and outcome for the patient. The s-d completes a self-assessment and a peer provides assessment by watching their patient interaction. The patient completes an assessment evaluating the s-d performance. After reviewing the patient and peer feedback, the s-d see a second patient. S-ds again complete a self-assessment, and a faculty member assesses s-d performance, which is the summative assessment.

CUSOM has data from the s-d, peer, patient and faculty assessments. Mr. Schmid has developed the assessments in concert with faculty members. There is an opportunity to assess the factors on these assessments and examine if the feedback cycle enhances s-d performance on the second patient visit. This project seeks to answer two research questions:

Research Question 1: Do the questions in the assessments measure what they are meant to measure?

Research Question 2: Do lower scores on the peer formative assessments encourage student-doctors to improve as shown on the faculty summative assessment?

Methods

The study will draw from an existing data set from one full cohort, likely to be from 2019-2020. The research project will focus on three locally created assessments. Assessment 1 (A1) is completed by the peer and a patient. Assessment 2 (A2) is completed by the student-doctor. Assessment 3 (A3) is completed by a faculty member.

Inventories

A1 is a survey with twenty-five questions in eight categories. A representative example is: “communication was poor, communication was good, or communication was excellent.” The eight categories are: open discussion, relationship building, gathering information, understanding the patient’s perspective, sharing information, reaching agreement on plans, providing closure, and biomedical.

The A2 is a survey with 31 questions in the same eight categories as A1. Representative examples are:

"0 of the steps were done, 1-2 steps were done, or 3-4 steps were done" or "communication was poor, communication was good, or communication was excellent."

The A3 is a survey with thirty-four questions in one biomedical category. Representative examples are: "does not examine body parts, examines 1-2 body parts, or examines 3-4 body parts" or "does not perform X, or does perform X."

Variables

The variables of interest are the assessment categories. I plan to create a scale, based on the exploratory factor analysis for A1, A2 and A3. A covariate will be the year in school of the student-doctor (from first to fourth year). .

Sample

The sample will be the archival assessment data on student-doctors over one academic year. It is anticipated about 640 records will be in the data set.

Analysis Plan

I proposed to compute an exploratory factor analysis for each assessment. Next, using the identified factors, I plan to compute multiple linear regression to determine if the A1 and A2 predict the A3 scores, with the year in school as a covariate.

Timeline - Spring/Summer 2021

I plan to devote about 20 hours/week on the project during the summer, in addition to the spring activities. Below is a proposed timeline.

Month/Day	Activity
March-April	develop and submit the IRB proposal.
May 17	attend the Welcome & Workshop.
May 18-21	complete literature review; clean the archival data; draft literature section for manuscript
May 24-28	conduct a factor analysis for the SA and a factor analysis for the PA; draft sample and methods section for manuscript; review manuscript requirements for *CUR Quarterly*
May 27	Student Progress meeting 1
May 31-June 4	conduct a factor analysis for the FA; draft findings section for manuscript.
June 3	Student/Faculty Progress Meeting 1
June 7-11	compute discrepancy scores for the SA and the PA; compute the FA using regression develop supporting tables and figures for manuscript
June 14-18	address Research Question 2 of whether the discrepancies in the SA and PA predict the FA for manuscript
June 17	Student Progress Meeting 2
June 21-25	begin writing my findings and discussion parts of manuscript to submit to *CUR Quarterly*
June 24	Student/Faculty Progress Meeting 2
June 28-July 1	revise and review final draft of manuscript for *CUR Quarterly*
July 5-7	finish poster presentation and manuscript; submit manuscript to *CUR Quarterly*

July 8	Present project and write reflection
Spring 2022	Present at Wiggins Symposium & Psychology conference to be identified

Budget

The psychology department will support this project by funding the following two activities.

$35	Statistical Package for the Social Sciences software
$500-$1,500	Registration & Conference Fees for regional conferences like the South Eastern Psychological Association.

References

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