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Measuring a state of mind indicative of thriving using the Student Pharmacist Inventory of Professional Engagement (S-PIPE)

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ABSTRACT

Background: Professional engagement has importance to the professional of pharmacy, and in particular the growth of student pharmacists. Measurement of this construct would allow investigation of factors that may increase or decrease professional engagement.

Objectives: To describe the development of the Student Pharmacist Inventory of Professional Engagement (S-PIPE), assess the factor structure and convergent validity, and test for differences in professional engagement based upon demographic and background factors.

Methods: Potential items for the S-PIPE were developed iteratively through inductive and deductive item-writing, 2 pilot administrations, expert review of items, and assessment of the content validity index, and cognitive interviews with students. The S-PIPE was administered to a cohort of 164 first year student pharmacists at University of Minnesota, along with items querying types and level of involvement in professional experiences and activities. An exploratory factor analysis was conducted using principal axis factoring extraction and Promax rotation. The number of factors to retain was based upon eigenvalues, examination of the scree plot, and a parallel analysis. Factors of the S-PIPE were compared to self-rated level of involvement and other demographic factors.

Results: Three factors were retained accounting for 70.7% of the variance, and named Belonging ($\alpha = 0.942$, 9 items), Connectedness ($\alpha = 0.864$, 3 items), and Meaningful Experience ($\alpha = 0.760$, 4 items). All 3 factors were significantly correlated to self-rated involvement ($r = 0.291$ to 0.370). Level of professional engagement differed in this study by gender, and pharmacy work experience.

Conclusions: This study lays the foundation for quantitative research in professional engagement among student pharmacists. Future work is needed to further validate and extend these findings.

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1. Introduction

Paramount to the profession, and the educators who grow student pharmacists, is the need to understand the mechanisms by which we develop students who embrace the profession, are excited by the profession, become immersed in the profession, and

flourish within the profession. Tied to these lofty goals, hidden beneath, is a concept that appears to have consequences on the development of student pharmacists – professional engagement. This research describes the development of an instrument designed to measure professional engagement in student pharmacists, and provides initial validity evidence for this instrument.

Owing its origins to a prior definition of work engagement,¹ professional engagement has been defined as “an energizing state of mind towards one's profession characterized by high energy, involvement with a sense of significance, enthusiasm, inspiration, pride, and being happily engrossed in one's profession.”^{2,3} Similar to conceptions of work engagement, it is considered a state of mind rather than direct involvement or participation in a specific activity.² Prior research has established that other types of engagement (i.e., work engagement, student or academic engagement) are linked to beneficial outcomes.^{4–16}

Abbreviations: S-PIPE, Student Pharmacist Inventory of Professional Engagement; CVI, Content Validity Index.

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Student engagement at U.S. undergraduate institutions is often measured using the National Survey of Student Engagement (NSSE), which has been shown among first-year undergraduate students to be related to persistence and to academic achievement (i.e. GPA) even after accounting for pre-college characteristics.¹⁷ At an institutional level, it has been related to first-year retention rates and 6-year graduation rates.¹⁸ As a result, the NSSE is used by undergraduate institutions to benchmark their levels of engagement, compare levels of student engagement to similar institutions, and identify areas where engagement can be improved.^{19,20} In addition, the information collected from the NSSE can help inform prospective students' and parents' choice of institution.²⁰

While the NSSE has great value in benchmarking and promoting best practices in undergraduate education, evidence for validity in student pharmacists is lacking.²¹ Additionally, it has been argued that school engagement is a very different construct of interest than that of professional engagement.² However, similar to work and student engagement, professional engagement is postulated to also be related to beneficial outcomes for pharmacists and student pharmacists alike.

Furthermore, while benefits have been declared based upon experiences and observations,^{2,22} evidence towards the outcomes or drivers of professional engagement remains sparse. This is partially due to the absence of a validated tool to measure professional engagement.

Within practicing medical professionals, professional engagement has been operationalized with a focus on work. For instance, one study measured work engagement and job satisfaction as a measure of professional engagement.²³ Another example is the Medical Engagement Scale, created based upon a two-dimensional model of professional engagement, consisting of organizational opportunity and individual capacity, and concerned with relationships, involvement, and motivation.²⁴ The items, subscales, and meta-scales within the Medical Engagement Scale focus on organizational climate and engagement within an organization or business. The subscales include climate for positive learning, good interpersonal relationships, appraisal and rewards effectively aligned, participation in decision-making and change, development and orientation, and commitment and work satisfaction.²⁴ While this scale aptly measures elements of the work engagement of professionals in an organization doing their professional work, it does not appear to gauge the engagement within their profession. This distinction deserves pause. Whereas an individual may be engaged in their work or organization, this does not automatically infer engagement in their profession.

In teachers, professional engagement has been measured using numerous proxies. One group of researchers used planned effort, planned persistence, professional development aspirations, and professional leadership aspirations as measures of professional engagement.^{25,26} Another group used participation in professional development activities and professional collaboration (e.g., discussing problems with colleagues, collaborating with teachers in other schools).²⁷ Alternatively, it has been measured using the number of within-school interactions, outside contacts, and involvement in leadership activities.²⁸ Professional engagement has been measured using participation in a variety of teaching-related activities that go beyond minimal effort (e.g., participating in extra-curricular activities, attempts to diversify teaching strategies).²⁹ And finally, among childcare providers, professional engagement has been measured using the number of professional organizations the providers were members of, and the number of professional contacts.³⁰

These operationalized definitions often involve quantifying the number of professional memberships and contacts, efforts above and beyond the typical professional development experiences, and leadership involvement; these are quite different than the above

definition of professional engagement, focusing more on effort, participation, membership, and connections than on a state of mind. Engagement within a profession is a much broader and amorphous concept. And for students growing within a profession, the work of the profession is much different than a pharmacist within an organization. Students may engage with the profession in class, in extracurricular activities, in pharmacy work experiences, in outreach and community service, and experiential education. They may even engage with the profession when they are asked for the first time at a family gathering, "Is it ok if I take *Medication X* with *Medication Y*?" These varied experiences may result in the cognitive affective state of professional engagement. To measure this state requires going beyond prior methods of operationalizing professional engagement, and necessitates looking beyond established elements of work or school engagement. The Student Pharmacist Inventory of Professional Engagement (S-PIPE) has been developed for measuring professional engagement in students with a focus on capturing the cognitive affective state of engagement within the pharmacy profession. The purpose of this paper is to describe the development process and validity evidence for use of the S-PIPE.

2. Methods

2.1. Instrument development

The S-PIPE was developed over a three-year iterative construction process that included inductive (i.e., qualitative data from highly engaged students)³ and deductive (i.e., conceptualization and measurement of other typologies of engagement) item development, and 2 pilot administrations. The complete process is shown in Fig. 1. Initially, 21 items were developed based upon a consensus definition and professionally engaging characteristics emerging from a modified Delphi process with highly engaged students.³ These items were administered to 82 third-year students in April 2013. This administration used a 5-point, Likert-type scale from 'Strongly Disagree' to 'Strongly Agree'. Based upon analysis from this administration, 2 items were removed. Conceptual coverage was questioned based upon review of the remaining items, and a factor of engagement that had only 2 items. Further, a thematic analysis of the initial qualitative data from the Delphi study suggested that additional items might be needed to ensure complete conceptual coverage. The 19 established items were mapped to the themes, while codes and quotes from the qualitative data were used to expand the item pool to ensure all themes had relevant items. Items were then mapped to definitions and measures of both work engagement^{1,9,10,31} and student engagement.^{17–20} In total, 21 items were added at this stage. The updated pool of 40 items was administered to 150 first-year pharmacy students in January 2014. This administration utilized a 4-point Likert-type response set to force an opinion (i.e., either agree or disagree, no middle point³²). Based upon analysis from this administration, 6 items were reworded and 6 items were cut, resulting in 34 items.

2.1.1. Evidence for content

A panel of 5 subject matter experts participated in review of the instrument in February 2015, providing quantitative ratings and qualitative feedback. Experts were selected based upon their experience with professionally engaged students (2 panel members) and expertise in assessment (3 panel members). A brief history of the instrument, a conceptual definition of professional engagement, and 34 items were given to expert reviewers electronically. They were asked to consider relevance of items to professional engagement, clarity of items, and possible improvements or changes. Reviewers were given access to an electronic survey conducted using Qualtrics (Qualtrics Labs Inc., Provo, UT), which

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