



2023-2024 Duke AHEAD Grant Proposal
Due by January 26th (5:00 pm)

Title: Identifying Factors that Affect Belongingness in First Year Medical Students

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Focused question: Our question has two parts: What are the factors that promote and hinder feelings of belonging among first year medical students? What are the opportunities to further improve belongingness and as a result, the learning environment?

Background: Feelings of belonging are important for academic success, motivation, and persistence (1). It has also been shown that factors in the learning environment can affect belongingness. Two studies of nursing students in the clinical setting, reveal that a welcoming and supportive environment increased students' feelings of belonging (2, 3). Several years ago, we intentionally modified the learning environment of the first year medical student course, Foundations of Patient Care 1 (FPC1), to make it more supportive and welcoming to our students. FPC1 is a 21 credit hour course that begins 3 weeks after the start of medical school and ends at the end of January. In general, the feedback from our first year medical students is that they feel supported and welcomed. However, we don't have data about how many students feel supported and whether or not students from underrepresented backgrounds feel as welcomed compared to other students.

When we made changes to our learning environment we changed many aspects of the course at once. We have increased messaging to students to make clear what they need to do to be successful. We created our messaging to help students feel supported. This messaging included the addition of a diversity statement to our syllabus. We make sure students know that we value their feedback; we want to hear if they feel they have been mistreated and emphasize that we will act on their feedback when possible. We have increased our discussion of racism and bias in medicine and increased our use of gender-inclusive language. The challenge with making so many changes at once, however, is that we don't know which changes have had a positive effect. In addition, we want to hear from students about other ideas and changes we might implement to continue to improve the learning environment.

Feelings of belonging have been measured in undergraduate students and health professional trainees and associated with increased academic achievement, persistence, and motivation (1). The vast majority of studies of belongingness in health professional trainees took place in the

clinical setting using the Belongingness Scale-Clinical Placement Experience (4, 5). For the pre-clinical curriculum, there are few studies, including one study that used the Psychological Sense of School Membership Scale (6) to measure feelings of belongingness at school in general (7). Dr. Regina Frey's group at the University of Utah has published several studies looking at belongingness in the undergraduate setting (8, 9, 10). To measure feelings of belonging in a specific course, they ask students 6 questions that use a 6 point Likert scale. Four of the questions assess how well a student feels they belong in a class and the other two questions assess the certainty of that belonging (if it is a consistent feeling and if it could change with changes in academic performance). They have found that in an undergraduate chemistry course, students from underrepresented groups and female students have reduced belonging scores and feel less certain about their level of belonging. The belonging scores also predicted academic performance and the likelihood of continuing on in chemistry (8). They also showed that academic success in a previous chemistry course did not predict feelings of belonging in the next chemistry course (10).

Specific aims: We are committed to ensuring that every Duke medical student feels supported in our curriculum.

Aim 1: Do students' feelings of belonging in our first year curriculum differ based on demographic variables? If so, do factors such as race/ethnicity, gender identity, sexual orientation, disability status, socioeconomic status, and educational attainment of parents correlate with differing feelings of belonging?

Aim 2: Do feelings of belonging change during the 1st year as students adjust to our curriculum?

Aim 3: What aspects of our learning environment contribute to feelings of belonging and what opportunities are there to improve perceptions of belongingness?

Methods: This mix method study will be voluntary for 1st year medical students taking Foundations of Patient Care 1. An IRB exemption will be attained before the start of the study.

Aims 1 and 2 – Assessing Belongingness

Survey

We will use a validated and anonymous survey (8, 9, 10) that will include questions about belongingness (questions 1-4) and belongingness certainty (questions 5-6):

1. I feel like I fit in the Foundations of Patient Care 1 course
2. I feel comfortable with my peers and classmates in the Foundations of Patient Care 1 course
3. I feel comfortable with my instructors in the Foundations of Patient Care 1 course
4. Setting aside my performance in class, I feel like I belong in the Foundations of Patient Care 1 course
5. I feel uncertain about my belonging in the Foundations of Patient Care 1 course
6. When I don't perform well, I feel like maybe I don't belong in the Foundations of Patient Care 1 course

For each question, students will have the answer choices: 1 = strongly disagree, 2 = disagree, 3 = mildly disagree, 4 = mildly agree, 5 = agree, 6 = strongly agree

The demographic portion of the survey will ask students about their background based on the Duke School of Medicine diversity categories. For medical students, this includes: race/ethnicity, gender identity, age, resident status, college major, educational attainment of parents, and socioeconomic status. Sexual orientation and disability status will also be added.

The survey will be administered in the 2nd week of Foundations of Patient Care 1 (5th week of medical school) and in week 16 to see if perceptions of belongingness changes with more time in the course.

Survey Analysis

Data from the belongingness survey, at both Timepoint 1 and 2, will be analyzed using Excel. Descriptive statistics will be calculated for each survey item and for all items combined. Outcomes of analysis will include measurement of belongingness for each demographic of interest at both timepoints. Changes in belongingness between Timepoint 1 and 2 will be quantified by a simple difference.

Aim 3 – Factors that Affect Belongingness

Focus Groups

Focus groups will be led by Dr. Sulochana Naidoo, who has no direct connection with the Foundations of Patient Care 1 course and does not interact with 1st year medical students on a regular basis. Any reports of mistreatment made by students during the focus groups will be handled in consultation with Dr. Jane Gagliardi, Associate Dean for Learning Environment and Well-being. A semi-structured interview guide will be created, consisting primarily of open-ended questions focusing on:

1. Aspects of the learning environment that contribute to feelings of belonging.
2. Aspects of the learning environment that hinder feelings of belonging.
3. Ideas for changes we could implement to continue to improve the learning environment and thereby improve belongingness.

A goal of this part of the study is to glean practical strategies to improve the learning environment for 1st year medical students.

Data Analysis

Focus group conversations will be transcribed and analyzed qualitatively for recurring themes.

IRB Status: Plan to submit

Challenges: Possible challenges include getting sufficient student participation in the surveys and the focus groups. Students may worry about being identified based on their answers to the demographic questions. Students may also be reluctant to share their feelings in the focus group due to fear of reprisal.

Works Cited:

1. Vivekananda-Schmidt P, Sandars J. Belongingness and its implications for undergraduate health professions education: a scoping review. *Education for Primary Care*. 2018 Sep 3;29(5):268-75.
2. Levett-Jones T, Lathlean J, McMillan M, Higgins I. Belongingness: A montage of nursing students' stories of their clinical placement experiences. *Contemporary Nurse*. 2007 Apr 1;24(2):162-74.
3. Levett-Jones T, Lathlean J, Higgins I, McMillan M. Staff–student relationships and their impact on nursing students' belongingness and learning. *Journal of advanced nursing*. 2009 Feb;65(2):316-24.
4. Somers MD. Development and preliminary validation of a measure of belongingness. Temple University; 1999.

5. Levett-Jones T, Lathlean J, Higgins I, McMillan M. Development and psychometric testing of the Belongingness Scale–Clinical Placement Experience: An international comparative study. *Collegian*. 2009 Jul 1;16(3):153-62.
6. Goodenow C. The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools*. 1993 Jan;30(1):79-90.
7. Aker S, Şahin MK. The relationship between school burnout, sense of school belonging and academic achievement in preclinical medical students. *Advances in Health Sciences Education*. 2022 Oct;27(4):949-63.
8. Fink A, Frey RF, Solomon ED. Belonging in general chemistry predicts first-year undergraduates' performance and attrition. *Chemistry Education Research and Practice*. 2020;21(4):1042-62.
9. Edwards JD, Barthelemy RS, Frey RF. Relationship between course-level social belonging (sense of belonging and belonging uncertainty) and academic performance in general chemistry 1. *Journal of Chemical Education*. 2022;99(1):71-82.
10. Edwards JD, Torres HL, Frey RF. The effect of social belonging on persistence to General Chemistry 2. *Journal of Chemical Education*. 2023 Oct 16;100(11):4190-9.

Resource needs and budget:

Funding will be available for a 12-month period. Please fill in the table below and provide justification/description for each item below. Also, where requested, please provide an estimate of the time/effort you will expend on this project. PI support may not total more than 25% of the requested funds. Administrative support is available through “consultant costs.”

	Description	Estimated Cost:
PI Support (no more than 25% of total funds requested)		\$
Consultant costs	Data Analysis	\$1800
Equipment	Focus group recording	\$200
Computer		
Supplies	Food for focus groups	\$500
Travel	Travel to conference	\$1000
Other Expenses	Transcription of focus group discussion	\$500
	Editing of manuscript	\$1000
Total Costs for proposed project:		\$5000

Please provide a brief explanation below for each item listed in your budget template. Upload this document into the Qualtrics form when complete.

Consultant costs: Dr. Naidoo, who will be responsible for the qualitative analysis, will be adding this work to her duties as a staff member

Equipment: We may need a microphone for recording the focus groups

Supplies: We would like to provide food for students who participate in the focus groups

Travel: Funds for conference travel to present the results of this study

Other expenses: We will need to pay to have the recordings of the focus groups transcribed for analysis.
We will also hire an editor to help format the manuscript.