Defining Student Success in Academic Medicine

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Abstract

Background: The U.S. healthcare delivery system must increase the number of physicians who will deliver health care, as well as increase the number of scientists who will analyze and address the ailments that challenge diverse populations. Because medical schools are responsible for the education and preparation of diverse professionals, medical school administrators are working to create and maintain programs that recruit and retain students from underrepresented groups in medicine.

Methods: This study follows A *Student Success Ad-hoc Committee* (SSAC) charged with a) defining student success, b) exploring the success of underrepresented students in medicine based on this definition, and c) drafting recommendations based on data and evidence collected. This self-study evaluates and assesses medical student experiences, their educational attainment, and outcomes at Indiana University School of Medicine. This aim is explored through the application of higher education theories to undergraduate medical education.

Results: This paper demonstrates how an interdisciplinary team of academic medicine professionals endeavored to critically study the perceptions of student success in medicine. The study showcases the institution's progress towards defining student success informed by literature on student retention and persistence, learning environments, and student outcomes. The paper includes recommendations based on a reflexive process about three areas: admissions and pre-matriculation, academic promotion, and the educational environment.

Conclusion: The authors challenge professional schools in conducting self-studies that expand the utilization of theoretical and conceptual frameworks external to medicine, and reinforce the application of higher education research into professional school settings.

Keywords: STUDENT SUCCESS, ACADEMIC MEDICINE, MEDICAL EDUCATION

Introduction

Academic medicine encompasses the traditional tripartite mission of educating the next generation of physicians and biomedical scientists, discovering causes and cures for disease, and advancing knowledge of patient care while caring for patients (1, 2). More than ever, it is important for academic medicine to prepare and educate a physician workforce that adequately serves the needs of an increasingly diversifying United States population (2). Minority groups, as defined by the U.S. Census Bureau, now comprise 37% of the U.S. population and are projected to comprise 57% of the population by 2060. The total minority population will more than

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double, from 116.2 million to 241.3 million over this fifty-year period (3).

According to Dyrbye et al., a diverse population of medical professionals will increase the ability to address health disparities among groups of similar backgrounds. Diverse representation in medical school can improve access and patient care for minoritized groups, and physicians from these groups most often conduct culturally responsive research (4). In addition, cultural competence in all providers help promote more effective health care delivery to a diverse patient population. It also promotes research that is inclusive of the needs and concerns of minority groups. The more diversity in these groups, the more diversity there is in addressing important research questions (2, 5).

The U.S. healthcare delivery system must increase the number of physicians who will deliver health care, as well as increase the number of scientists who will analyze and address the ailments that challenge diverse populations (2, 6). Because medical schools are responsible for the education and preparation of diverse professionals, medical school administrators are working to create and maintain programs that recruit and retain students from underrepresented groups in medicine (URIM), as well as increasing the number of underrepresented faculty (2, 7, 8). This self-study is a result of proactive evaluation and assessment of medical student experiences, their educational attainment, and outcomes at Indiana University School of Medicine. A *Student Success Ad-hoc Committee* (SSAC) was charged with a) defining student success, b) exploring the success of URIMs based on this definition, and c) drafting recommendations based on data and evidence collected. This initiative is the foundation for this paper.

The purpose of this paper is to demonstrate how an interdisciplinary team of academic medicine professionals endeavored to critically study the perceptions of student success in medicine, specifically as it impacted URIMs. This goal was achieved through the application of higher education theories and conceptual frameworks to undergraduate medical education. The study showcases the institution's progress towards defining student success informed by literature on student retention and persistence, learning environments, and student outcomes. The paper includes recommendations based on a reflexive process about three areas: admissions and pre-matriculation, academic promotion, and the educational environment. The authors challenge other medical schools in conducting self-studies that expand the utilization of theoretical and conceptual frameworks external to medicine and reinforce the possibilities of applying higher education theories, such as student development theory.

Literature Review

Review of literature in academic medicine reveals that little research is available on program, curriculum, or policy changes to improve student success. Most studies about URIMs were conducted in the 1990s and no studies were found to examine the success of URIMs, only the "achievement gap" between URIM and non-URIM students through single-item measures of outcomes, such as discrimination, satisfaction, or test scores, when compared to their non-URIM peers (9, 10). Although students perceive medical schools to be increasingly diverse, experiences of bias continue to remain steady for students of color, including URIMs (11).

These aforementioned studies indicated that students of color have a significantly different experience in medical school and are potentially studying in an environment that might not be culturally engaging or inclusive (9, 11). For this study, the authors define students of color as medical students who have self-identified as Black/African American, Latino/Hispanic, Asian or Asian American, Pacific Islander, Native American, and multiracial.

When assessing medical student learning environments and how they impact student success, it is important to also consider

experiences of mistreatment and psychosocial factors that can facilitate or inhibit learning. This section provides an overview of literature on the psychosocial experiences of medical students and medical student mistreatment, with a particular emphasis on the experiences of URIM students.

Psychosocial development relates to both psychological and social aspects of a student's life. Medical students face significant academic, psychosocial, and existential stressors throughout their medical education training. Burnout and student distress have been found to affect up to 50% of medical students (8). Additionally, school stressors like sleep deprivation, student abuse, and the hidden curriculum can impact a student's well-being and psychosocial development. Vallance (1974) described the hidden curriculum as one that includes all aspects of schooling such as interactions, structure of classroom, and larger values of schooling as a social system; as values and processes that maintain class structure in education; and one with different levels of intentionality, hiddenness, and outcomes. For the purpose of this paper, the hidden curriculum is defined as values and processes found at the core of the content delivered for the implicit purpose of maintaining deeply ingrained perspectives and expectations (12). Dyrbye et al. found that the medical school learning environment was independently related to and had a critical influence on student burnout (4). The environmental characteristics strongly tied to burnout were dissatisfaction with the learning environment and level of support from faculty, clinical residents, and clerkship organization.

For students of color and other non-traditional students, their experiences of psychosocial factors are complex. Beagan found that URIM students experienced less supportive learning and social environments due to being victims of discrimination and racial harassment (13). URIM students further reported feelings of invisibility and/or being perceived as inferior. Consistently, URIM student participants in the study were found to experience stereotype threat or concerns with being perceived as demonstrating a stereotype. Research also found non-traditional aged students to struggle in educational environments. Because non-traditional students often have commitments outside of school that add to their distress, they find educational environments lack the resources and support systems to accommodate their needs (14).

For URIM students, research suggests that medical schools are sites of microaggressions, or acts that are additive overtime and convey disregard and disrespect of its recipients (13). Such experiences overlay documented URIM student outcomes. URIM students are up to five times more likely to fail in the Step1 medical license examination, four times more likely to fail both USMLE Step1 and Step 2 examinations, and less likely to graduate or complete medical school within four years compared with their peers. Moreover, research suggests that URIM students have greater difficulty establishing a network of peer support and finding same-race role models and mentors (15).

Methods, Design and Setting

Indiana University School of Medicine (IUSM) is the largest medical school in the U.S. and is annually ranked among the top medical schools in the nation (16). Students pursuing a Doctor of Medicine (MD) degree at IU School of Medicine progress through a statewide four-years medical education curriculum that includes training in the basic sciences as well as clinical training in tertiary care centers, community hospitals, ambulatory care settings, student-outreach clinics and physician offices. Many students also take advantage of opportunities to participate in medical research as well as campus and community programs. The mission is to advance health in the state by promoting innovation and excellence in education, research and patient care. Women and people of color remain underrepresented

at the institution, in the same manner these groups remain underrepresented in academic medicine. A core emphasis at IUSM is to advance women and underrepresented minorities in medicine and science.

In alignment with the Association of American Medical Colleges (AAMC). The Association serves the leaders of America's medical schools and teaching hospitals and their more than 173,000 full-time faculty members, 89,000 medical students, 129,000 resident physicians, and more than 60,000 graduate students and postdoctoral researchers in the biomedical sciences.

AAMC, IUSM is mindful of all race, ethnicity, language, nationality, age, sex, gender identity, sexual orientation, religion, work styles, character traits, wealth, educational advantage, disabilities, rural learners, first generation learners, and those from groups traditionally underrepresented in medicine. It is important to note that during the time the Student Success Ad-Hoc Committee (SSAC) convened, the IUSM Strategic Diversity Framework, which outlines the importance of diversity in the work of IUSM and provides direction for future endeavors, was approved by IUSM leadership. SSAC members represented individuals within the academic and educational pillar of the institution, leaders in Medical student education and affairs, diversity affairs, higher education scholars, administrative leadership, as well as trainees.

The framework identifies IUSM defined diversity categories as Black/African American, Hispanic/Latino, and trainees committed to practicing in rural Indiana. These populations were identified as underrepresented in the state of Indiana (16). While the scope of the SSAC was to examine all student success, specific attention was given to these school defined diversity categories in every part of the process.

During the fall of 2016, the IUSM Faculty Steering Committee (FSC) formed the SSAC to investigate the state of student success at IUSM based on findings derived from existing in-house data and to situate these findings against existing literature on factors influencing medical student success. The FSC found that although there were several parallel conversations occurring across campus on a multitude of data related to students repeating or failing courses and/ or not matching a residency opportunity, a formalized system-wide review of the data had not been completed. While at first glance, it seemed that underrepresented students needed additional attention, the SSAC was created to determine if this was in fact the population of students that required additional focus and what other recommendations could be made to support all student success based on data and literature in the field.

The SSAC was charged to a) define student success, b) explore the success of URIM students based on these definitions, and c) propose evidence-based interventions to improve student success. In the following sections, we discuss how the SSAC approached data analysis, the related results, as well as, overall recommendations.

Before data analysis began, the SSAC adopted a formal definition for student success. Taking into consideration a number of indicators, such as academic performance, graduation, matching into residency, and the review of literature defining student success in medicine and higher education, the SSAC agreed to define student success as a measure of medical school education that reflects the strength of the student's credential for graduation, for successfully matching into residency, or for securing an intended career after graduation (16). This definition is the impetus on which the findings and recommendations of this report are based.

Data Collection, Analysis and Result

We examined metrics associated with this definition of success, which included: current enrollment data, retention and

attrition indicators, course failure rates, standardize test scores of the U.S. Medical License Examination (Step1 and Step2), mistreatment data reported via AAMC Graduation Questionnaire (GQ), graduation rates, and match rate into residency programs. In addition, we considered environment indicators: satisfaction with quality of medical education; learning environment indicators (such as emotional climate, student-student interaction, and student-faculty interactions); quality of life indicators (such as burnout, social interactions and support, perceived stress); and experiences of discrimination.

The SSAC began a reflexive process of examining existing internal data, discussing committee member observations, reading relevant literature, and categorizing the learning from these activities into three areas: (1) admissions and pre-matriculation, (2) academic promotion, and (3) mistreatment.

Admissions and Pre-matriculation

The SSAC examined admissions and matriculation data and created predictive models using these factors to predict the following areas of success: entering class attrition, academic promotion from 1st to 2nd year, and the likelihood of scoring above average on the Step1 examination, obtaining an isolated deficiency in medical knowledge (ID-MK) in 3rd year, and obtaining an above average 3rd year Grade. The predictive models were built using logistic regression software which takes past behavior to predict a dichotomous outcome. Predictor variables and their relationships were identified and used to model future behavior.

After evaluating multiple predictive models, graduation, and attrition data, the SSAC found very few pre-matriculation characteristics that could negatively or positively influence student success as defined. Suggesting pre-matriculation differences between admitted students had little impact on the ability of a student to succeed at IUSM. There were no pre-matriculation data found that could be used to predict the likelihood of graduation. Therefore, the committee focused their attention on student performance measures that were found to impact graduation and had the potential to impact residency match success.

In reviewing the data, the SSAC agreed that class rank and grade point average in the first and second year influence residency potential (17). The matriculation data also showed a relationship between 1st year GPA and USMLE Step1 performance. A review of Step1 scores and 3rd year clerkship grades showed that students who performed poorly in these areas were less likely to graduate. Further, Step1 scores and clerkship performance could also have a significant impact on student residency match success (17).

The predictive models, admissions, and matriculation data as well as graduation and attrition data suggests that student performance in the first year was the most important predictor of student success. The data suggests there might be environmental factors affecting the ability of these students to succeed. Further, the data suggests developing positive and impactful interventions to implement upon matriculation of the URIM student groups is warranted as opposed using these data as a screening tool during the admissions process (18).

Academic Promotion

The SSAC defined academic promotion as a medical student's ability to progress through the program with passing scores. Further, that student would have the capacity to pass all future exams and move into the matching phase of the program with competitiveness. The SSAC examined available academic data, such as graduation and retention rates, course and exam failures, and matching data. The SSAC also looked at psychosocial factors, such as familial support and access to relevant mentoring and professional development, which contribute to student success.

Course, Exam, & Clerkship Failures

A trend from the 2011 (21%) through 2015 (42%) cohort of matriculants showed an more students were not only failing courses but were failing multiple courses in the 1st year. Course failures in gross anatomy comprised an average of 30% of all single and multiple course failures from 2011-2015. Course failures in physiology (14%) and biochemistry (13%) comprised the next highest percentages of all course failures from 2011-2015 cohorts. While there appears to be little correlation between academic failure of a single course in the 1st year and later academic difficulty, there was a clear correlation with multiple failures in the 1st year or academic difficulty in 2nd year with future academic difficulty.

When disaggregating academic difficulty data by IUSM student race and ethnicity, Black/African American students comprised a higher percentage of academic failures compared to their enrollment percentage in the cohort across all cohorts 2011 to 2015. The same was true for Asian American students in the 2011 and 2014 cohorts and Hispanic/Latino(a) students in the 2013 and 2014 cohorts.

Match, Graduation & Retention Rates

Overall, IUSM students were not matching into residencies at rates comparable to the national average. In 2016, 12.2% of IUSM students did not match, compared to 6.1% at a national level (17). Further, IUSM URIM students comprised 43% (n=6) of unmatched students in 2015 and 44% (n=7) unmatched students in 2016. After examining retention and graduation rates of 2011 cohort, the SSAC found that students of color were not persisting and graduating at the same rates as all students. Similar rates were found when examining the retention and graduation rates of first generation students. For example, while IUSM retained 92.9% of students of color in the 4th year, only 61.9% conferred medical degrees, compared to 81.3% of all students entering in 2011.

Programming Supporting Student Success

Because numerical data provided only one side of the story, the SSAC was interested in exploring literature to support the effectiveness of the programs currently offered by IUSM. Specifically, the committee examined literature related to mentoring and career development, and initiatives supporting mental health well-being and family support.

Mentoring and Career Development Support

IUSM recently implemented the Mentoring & Advising Program (MAP) to support medical students in career development. Such implementation is a monumental step forward in our approach to the success of all our medical students. The IUSM Office of Diversity Affairs is championing initiatives to ensure that advising faculty are great mentors and culturally sensitive (18-20). Even so, the faculty mentorship will not immediately reflect the diversity of the student body. It becomes important for faculty mentors to provide opportunities for all students that will help student of color success as well (21-24).

Mental Health Well-Being

IUSM took steps to increase student mental well-being by making amendments to the curriculum. First, shifting to a pass/fail grading system can decrease student stress during medical school. Previous studies determined that higher levels of stress and exhaustion in schools with grading schemes of three or more levels compared to schools with pass/fail grading (25). IUSM also implemented more problem based learning opportunities, which are associated with less perceived distress (26).

Family Engagement

IUSM currently hosts a family orientation during student orientation at the start of the school year for incoming first year students. While family engagement is a well described concept in the literature on recruitment and

retention of minority and first generation students at the undergraduate level, less is written about the impact at the professional and graduate level. There are, however, some transferrable components. Student from various cultural backgrounds experience "tug of war" between fighting to save familial support (by staying involved in family affairs) and test/ assignment preparation (27, 28). In addition, African American students who have strong family support during matriculation have a higher chance of completing the degree and selecting careers that serve the community (29).

Mistreatment

The SSAC found that there were two sources indicating the need to address student mistreatment - the IUSM Tolerance Survey and the 2016 AAMC Medical School Graduation Questionnaire for IUSM. According to the 2016 AAMC Medical School Graduation Questionnaire for IUSM, compared to all students surveyed, IUSM students were less aware of mistreatment policies (89.4% IUSM compared to 95.7% nationally) and of the procedures for reporting mistreatment (70.1% IUSM compared to 82.3% nationally). Compared to the national average, IUSM students reported higher rates of experience with 12 of the 17 mistreatment behaviors.

For institutions to understand, intervene and prevent mistreatment, students first must report it. Most the data about mistreatment is derived from medical student's reports of such experiences. Thus, an essential quality for any effective reporting mechanism is to protect students from retribution or retaliation for reporting mistreatment. Faculty must also be protected from false accusations as the sources of mistreatment (30).

Discussion

Student success can be defined in a variety of ways. Common metrics include attainment indicators such as standardize testing, enrollment data, grades, persistence to subsequent academic years, length of time to degree, and graduation (31). This study and in accordance with student success conceptual lens, SSAC defined it *as a measure of medical school education that reflects the strength of the student's credential for graduation, for successfully matching into residency, or for securing an intended career after graduation.* In defining student success, SSAC considered the plethora of traditional measures in higher education research, which again highlights important components that should be incorporated into professional schools, and specifically academic medicine.

The most difficult measures are those not easily quantifiable and include the experiences that largely shape the learning environments of medical students, especially URIM students. There are parallels between the experiences of URIM students in higher education at undergraduate and graduate levels.

Because of a wealth of knowledge, expertise, and strong desire to support our medical students, SSAC put forward a series of recommendations that were exhaustive, based on scholarship and best practices centered on student retention and persistence, learning environments, and student outcomes in higher education. The following are focused on admissions and pre-matriculation, academic promotion, and the educational environment.

Admissions & Pre-Matriculation

Adoption of a Head Start Summer Preparatory Session. A summer program will be highly recommended to those high attention students identified during admissions and required of those students who are high attention based on their first-year academic performance. The prematriculation summer program will be open to all who are interested.

Racial/ Ethnic Diversity Programming. Identify and institute programs that have been shown to create equity for Black/African-American, Hispanic/Spanish/Latino(a) students. These student populations are defined as IUSM's underrepresented minorities in medicine. As cited in the factors facilitating

student success, such as mentoring and family support, programs created with equity in mind for the success of minority students are also effective for all students. The nuance here is to use practices relevant to minority students in the development and implementation of success programs.

Curriculum Integration. Hire a curriculum integration specialist who focuses on improving test taking skills (medical knowledge) and curriculum integration skills.

Continue Research and Evaluation. Further evaluate etiology for potential disparities in clerkship rotations including student interviews of above and below average performing students.

Academic Promotion & Graduation

Develop a Series of Test Taking Strategy Sessions. We recommend providing a comprehensive repository of tests. Test taking skills could be improved through focused tutoring sessions.

System for Providing Medical Licensing Resources. Medical license resources should increase exposure to U.S. licensing exams that may prove helpful for identifying strengths and weaknesses prior to the exam.

Mentoring, Advising & Tutoring System. Currently, IUSM engages Lead Advisors, the Learning Specialist, and additional tutors to identify students struggling in their classes and to provide support. Funding for a statewide organized tutoring system, overseen by a Learning Specialist, related to tutor training and oversight, would be beneficial for student success. We also recommend that the mentoring and advising program creates opportunities for our medical students to work with physicians on projects and/or shadow them.

Track Use of Learning Resources. A survey should be conducted on students who performed well on the licensing examination and ask about resources that they used for preparation. It would be helpful to also know frequently used learning tools that trend between successful students across multiple cohorts.

Tuition for Repeated Year. Adoption of policy that does not charge tuition to medical students who are repeating a year of medical school as their remediation. The expectation of our institution is for successful matriculants to pay only four years of medical school; therefore, we recommend that charges for a repeated year not be administered or a total of only four years of tuition be assessed to students.

Two Year Masters. Confer a Master of Science in Biomedical Sciences or Master of Science in Medical Sciences for students who successfully complete the first two years of medical school and decide that they do not wish to continue.

Educational Environment

Curricula Consideration. Based on the psychosocial context and well-being of students it would be important to consider opportunities for awareness, support, and tools addressing these factors. It has been noted that the *transition courses* may provide the space for offerings that provide development of skills and tools. Proficiency in these aspects is not only essential for medical care, but it is also an important tool in self-care.

Develop Socialization Support. IUSM should incorporate more opportunities through Medical Student Education, especially for minority students who often find themselves invisible or inferior.

Faculty and Professional Development. Comprehensive faculty development, which is more important today than ever before, empowers faculty members to excel as educators and to create vibrant academic communities that value teaching and learning. We need to develop programs that clearly define mistreatment and harassment with thorough examples of how these manifest in the learning environment. Further, we need to educate faculty on how to talk about race and diversity with confidence. There should also be "bias in grading" training to ensure preceptors are providing quality evaluations. Create a zero-tolerance policy on mistreatment. IUSM should have a clear declaration of intent across medical education, to provide, maintain, and support learning environments that are

rooted in respect for all patients, learners, teachers, and team members. We propose a tiered system for responding to mistreatment concerns (level 1- discussion and feedback, level 2- individualized plan, level 3 supervisor involvement, level 4 disciplinary intervention). Reporting Structure. IUSM must assure that the reporting mechanism for mistreatment is safe and accessible to all; students must be protected from retribution or retaliation for reporting mistreatment. Mandatory and centralized tracking of all reported mistreatment incidents should take place. Consistent with the mistreatment response system proposal, there should be a dedicated to a mistreatment project/case manager.

Family Orientation and Ongoing Programs. Continue to implement the optional, statewide Family and Friends of Medical Students (FFMS) session for all medical students. Family engagement is a well described concept in the literature regarding recruitment and retention of minority and first generation students at the college level. Family is defined as spouse or significant other, parent or guardian, a relative, or any person providing mental, emotional, spiritual and/or financial support for the student. Medical Student Education. IUSM should provide programmatic funding and personnel resources to allow activities that support students and assess the learning environment (i.e. Data Analyst). Centralizing ongoing holistic assessment of the learning environment and student success with one staff member allows members of IUSM to access data in a simpler manner, with this staff member understanding the different sources of data available and streamlining data for ease of consumption.

However, there were some interesting concepts that will need further examination. Although we chose to utilize the term "underrepresented in medicine" (URIM), our discussions included other commonly used terms. For example, although we based our efforts on the URIM definition promulgated by the institution (IUSM), we recognize that this version could be contended based on two points. First, the definition of URIM used by diversity programs in academic medicine can vary widely with many centers defining URIM more broadly to encompass other demographic and personal characteristics. This broadness, or in some instances specificity, might be used to represent the state in which the institution operates and in meeting the health needs of an increasingly diverse population. Secondly, the relevance of utilizing the term "minority" can be challenged or further explored. This is important not only because of current social-political environment, but in an academic medicine environment which would be considered in higher education literature as a predominantly white institution (PWI). While in some instances the word "minority" would be appropriate, we would like for academic medicine to view opportunities that challenge social and education (in) equities and acknowledge equality, inclusion and concepts of intersectionality and multiculturalism.

Largely centered on student affairs, the higher education literature offered an opportunity to delve into our medical education. Specifically, the need for incorporating theory and innovation in adult education. Although, this study did not explore curriculum and medical education delivery, an argument can be made that more information in this area would further expand the understanding of the educational environment, the ability to engage, support and inspire our medical students.

This study demonstrates an urgent institutional need to consider higher education literature in the context of medical student success, as well as the expansion of theoretical and conceptual models that advance the mission of academic medicine and other professional schools. Medical school admissions, learning environment, promotion process, graduation requirements, and the creation of inclusive environments can all be informed by research and evidence. Although the topic of medical student success is not as extensive in academic medicine literature, there is certainly sufficient

higher education research and knowledge that can guide medical student and professional student success.

Given this extensive research, we propose future agendas that address medical school admissions and pre-matriculation processes based on institutional data and modeling. Part of the contributions of business intelligence and data mining is guidance by predictive models. However, we caution that although motivated by data, these predictive models should not be created with the expectation of becoming exclusionary criteria. As scholars, we resoundingly support a holistic review and will continue to endorse this approach, especially supporting URIM admissions and their educational experience.

More institutional research is needed to examine the influence of different academic, social, and environmental factors on students' graduation rates and post-graduate goals. These are measured by not only graduation, but promotion into a residency program. A study exploring indicators and patterns of residency placements would contribute in gauging impact on student success. Specifically examining learning environments, a qualitative approach can help institutions understand attrition and the experiences of students who withdraw from the institution, but also standardizes a process in which we can actively learn from programmatic initiatives and institutional climate. In addition, by conducting URIM specific studies, we can dismantle structural barriers, identify exclusionary practices and environments that counter the institution's mission, vision, and diversity and inclusion efforts.

Conclusion

This paper demonstrated how an interdisciplinary team of academic medicine professionals endeavored to critically study the perceptions of student success in medicine. This endeavor was explored through the application of higher education theories to undergraduate medical education. The SSAC defined student success and identified three areas of impact: admissions and pre-matriculation, academic promotion and graduation, and educational environment. Through this process, we found very few pre-matriculation characteristics that could negatively or positively influence student success as defined. However, we found a need to enhance educational and learning environments by emphasizing student services with special attention to the institutional climate.

After this student success report was submitted, IUSM leadership took an active role in implementing programs suggested by this interdisciplinary team including an early warning system that identifies students who might not achieve academic promotion, graduation or successful matching to provide necessary interventions and active monitoring. IUSM also restructured the student mistreatment reporting system and mental health well-being services; both important factors for student success.

It is important for medical schools to address the academic needs of their students through the application of higher education theories, so they can achieve their highest potential but at the same time, identify and address the specific needs of URIM students who remain a vulnerable population in undergraduate medical education.

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