

# Work-in-Progress: Emergent Themes from “High Impact” Role Model and Mentor Narratives

Kyle Trenshaw  
*Center for Excellence in  
Teaching and Learning  
University of Rochester*  
Rochester, NY, United States  
kyle.trenshaw@rochester.edu

Derek Rushton  
*Center for Excellence in  
Teaching and Learning  
University of Rochester*  
Rochester, NY, United States  
derek.rushton@rochester.edu

Elif Eda Miskioğlu  
*Department of Chemical  
Engineering  
Bucknell University*  
Lewisburg, PA, United States  
elif.miskioğlu@bucknell.edu

Philip Asare  
*Department of Electrical and  
Computer Engineering  
Bucknell University*  
Lewisburg, PA, United States  
philip.asare@bucknell.edu

**Abstract**—This work-in-progress study continues prior work aimed at increasing the access of underrepresented minorities (URMs) in STEM fields to role models and mentors through values-focused, narrative profiles. We developed narrative profiles in which URM role models and majority mentors share their personal and professional experiences. Profile content follows from our work in identifying what URMs in STEM value in role models and mentors, allowing the profiles to serve as a vehicle to encourage URM students working toward STEM degrees. In this paper, we address the following research question: what themes emerge from the comparative analysis of “high-impact” role-model and mentor profiles? Specifically, we use emergent thematic analysis to explore similarities and differences across role model and mentor profiles that are considered “high-impact.” We see that high-impact profiles tend to contain longer, more complete narratives that mention challenges in adjusting to their university, self-transcendent reasons for giving back to others and viewing failure as a process. These results will inform future profile development processes. By further refining these windows into the lives of role models and mentors, we can expand the definition of success in STEM and create emergent pathways of resilience for URM students. Through integrating profiles into the recruitment process, orientation, courses, and other campus resources, we can help students connect with role models and mentors as they transition to college life and continue into their future careers. We believe the flexibility and adaptability of this intervention has great potential for impact across STEM contexts.

**Keywords**—underrepresented minority, mentorship, storytelling

## I. INTRODUCTION

Role models and mentors play a vital part in the success of college students; however, the impact of these relationships largely depends on having a strong connection between the student and their matched support person. The matching process can depend on the availability of role models/mentors, proximity or convenience of the match, or perceived similarities based on matched racial or ethnic identity despite these factors being largely surface-level and tangential to the fit of the match. In STEM fields, underrepresented minority students (URMs) by definition rarely share their racial or ethnic identity with potential role models or mentors in their fields [1].

As a means of increasing both the pool of, and access to role models and mentors for URM students, we developed narrative profiles in which URM role models (i.e., no in-person contact with the student) and majority mentors (i.e., frequent in-person contact with the student) share their personal and professional

experiences [2-4]. Further details on development of the profiles can be found in previous work.

While race- and gender-based matching of role models has been previously linked to higher academic achievement [5], our previous work with near-peer mentors showed that viewing narrative-based profiles of majority mentors correlated with increased URM attendance in the mentor-led small-group problem-solving sessions associated with introductory calculus courses [3]. We seek to build on this work by exploring the nature of profiles based on their observed effects on students’ engagement through the following research question: what themes emerge from the comparative analysis of “high-impact” role model and mentor profiles?

## II. METHOD

Because our population of interest includes profiles used in two different contexts, what constitutes a high-impact profile is defined differently for each context.

### A. Sample

For the role model context, our population of interest is defined in previous work [2]. We created profiles for 10 URM alumni who graduated with STEM degrees from a small, private, liberal arts university and shared them with a representative sample of current URM students in STEM at the same university. These alumni serve as our role model population.

The mentor population of interest for this study comes from seven introductory or intermediate mathematics courses offered during the Spring 2019 semester at a private, research-intensive university. There were a total of 42 mentors staffing these courses; 31 of those mentors made profiles that were posted on the corresponding course website, and 22 of those who made profiles consented for their anonymized profiles to be included in this study.

### B. Defining “High-Impact”

For role-models, “high impact” is defined by the perceptions of the URM students who viewed the profiles. Those students were asked to indicate whether each role model alum was “fit” to serve as a role model for them after viewing their profile. A profile was defined as high-impact when half or more of the student viewers indicated the alum as fit to serve as a role model for them. Using this definition, 5 role model profiles were considered high-impact and 5 low-impact (i.e., less than half of the student viewers indicated the alum as fit). Thus, we include

all 10 role model profiles in our final sample for the role model population for comparison.

For the mentor context, a profile was defined as high-impact when more than one-third (>33%) of the high-attending URM students (i.e., those who attended at least one more small-group problem-solving session than the average attendance in the course) had viewed the profile over the duration of the semester. Note that this definition of high-impact is an indirect measure; we use session attendance as a proxy for students' reactions to the profiles, unlike the direct student reaction data from the role model population. Using this definition, six profiles from four courses were considered high-impact. However, only profiles from two of the four courses had corresponding consented low-impact profiles (i.e., profiles that did not meet the >33% threshold for high-attending URM students who viewed the profile). Four of the high impact profiles were also from those two courses; thus, we include four high-impact profiles and four low-impact profiles from two courses in the same introductory calculus sequence in our final sample for the mentor population.

### C. Emergent Thematic Coding

We coded profiles with two considerations as guides: 1) the codes from a previous thematic analysis of role model and mentor profiles [5] and 2) the visual structure of the mentor profiles as they were displayed on the course websites. While these two considerations helped to focus our analysis, we allowed space for new comparative codes to emerge from the data. After coding all high- and low-impact profiles in both populations, we developed comparative themes in four categories: A) High-Impact to Low-Impact Role Models, B) High-Impact to Low-Impact Mentors, C) High-Impact Role Models to High-Impact Mentors, and D) Low Impact Role Models to Low Impact Mentors. We present themes from each of these categories as a distinct analysis in our results.

## III. RESULTS AND DISCUSSION

### A. High-Impact Role Models Versus Low-Impact Role Models

While all role models shared similar backgrounds, aspirations, motivations, and family values, there were notable differences in the depth and directness of responses between the two groups. High-impact role models trended towards narratives of greater depth and gave more specific and concrete information. The tendency of high-impact role models to be more direct, or "real," in their responses manifested in several ways. Most notably, high-impact role models admitted to moments of failure or struggle in their narratives when asked to describe such scenarios. Their narratives included accepting responsibility for either the failure itself, if they were at fault, or for mitigating its effects if it was less within their control. The answers demonstrate a recognition of "failure as a process," as opposed to an outcome. One example of such a response is:

"One of my greatest failures professionally occurred within the first 3 months of my career. In an effort to implement lean principles within one of my company's manufacturing areas, I mistakenly discarded multiple pieces of highly-valuable manufacturing equipment that I thought was obsolete. When I found out that I had made such a costly mistake, I was extremely embarrassed, especially since I was highly focused on proving to my

employer - and to myself - that I could succeed. I began by taking full responsibility and communicating the issue to my manager, and subsequently developing a plan to communicate the implications of the mistake to my company's customers. Then, I worked with a team to come up with a recovery plan. In the end, my manager was impressed by the haste with which I developed a plan to recover from the error. Overall, this mistake actually had a net positive effect on my reputation; my manager, as well as others within the organization, then knew I would be willing and able to respond quickly in the event of a work-related catastrophe."

We contrast this with the low-impact narratives of role models, who reported that they had "never failed professionally" or that "failing is relative. [...] Quitting is not an option and neither is utter failure [...] I don't quit!" The low-impact role models neither acknowledged nor took responsibility for failure.

High-impact role model profiles also included more direct descriptions around transitions, both to college and then subsequently to the workforce, than their low-impact counterparts. High-impact role models noted significant adjustments in adapting to their university (both socially and academically), whereas low-impact role models reported easily assimilating to the new environment. Several high-impact role models admitted to significant academic hardship and reported having to navigate how to seek support and utilize their resources (e.g., professors). Finding small groups of like-minded individuals or interest-based clubs was often noted as critical to the high-impact role model's support structure. In the transition to the workplace after college, high-impact role model profiles noted that while there was some adjustment, they felt prepared for their professional careers upon graduating. Low-impact role models did not mention professional preparation and gave vague, incomplete descriptions of this period of transition.

High-impact role model narratives also showed a focus on others; their community involvement and risk-taking were motivated by giving back to or serving others. Examples included outreach to serve and support others in ways which the role models had not been supported themselves, and even leaving leadership positions because of "the organization's financial requirements to reduce expense through staff reductions/layoffs." Low-impact role models were more focused on personal gains in the form of advancement, achievement, or happiness. This focus also came out in descriptions of each group's professional passions.

### B. High-Impact Mentors Versus Low-Impact Mentors

On average, high-impact mentor profiles had more distinct text areas and higher word counts than low-impact mentor profiles in the same courses. The biggest qualitative difference between high and low impact mentor profiles was the theme of giving back. Whether it was community service, making the world a better place, taking action toward a good cause, or paying kindness forward, high-impact mentors included more mentions of somehow giving back in their profile narratives. Notably, one low-impact profile described tutoring for pay, while multiple high-impact profiles included mentions of tutoring as volunteer outreach to area schools. This idea of specifically giving back to one's home community came up

across the high-impact profiles, whether that meant one's hometown or one's country of origin. Relatedly, hometown appeared to differ between high- and low-impact mentors, with more high-impact mentors coming from urban areas or moving around during childhood and low-impact mentors describing happy childhoods spent in suburban areas attending private secondary schools prior to matriculating to college.

When describing their experience transitioning into college, high-impact mentor narratives described feelings of cultural isolation, being far from home in a city that felt very different to them, and dealing with language barriers. These experiences translated to a sense of the immenseness of college life: not being accountable to anyone else, suddenly being just one of many high-achieving students instead of being seen as the top of their class in secondary school, and acknowledging that everyone was coming into college with this same possibility of feeling overwhelmed. Low-impact profiles, on the other hand, described joining clubs and making new friends with relative ease, rather than highlighting the potential struggles that some students could be facing in their acclimation to the college experience. Further, high-impact mentors included more robust failure narratives, although the types of difficult situations described by both high- and low-impact mentors were of similar context (e.g., low grades, disappointment in a job search, etc.). High-impact mentors often described the conditions that led to the failure, the experience of the failure for them emotionally, their corrective response, and the outcome, while low-impact mentors usually focused on only the failure event and their corrective response without going into further detail.

Our analysis revealed some similarities between the high- and low-impact profiles in addition to the differences described above. These similarities include descriptions of the importance of staying connected to family and friends, the clubs the mentors took part in, their engagement in undergraduate research, and subject-specific passions or motivation (e.g., "the beauty/challenge of mathematics," etc.). Further, all mentors described aspirational goals related to their future careers and the kinds of people they wanted to be in the future. There were international students represented in both groups, and both high- and low-impact narratives included mentions of meeting diverse people in college. Finally, both high- and low-impact mentors shared advice for future students in their profiles, and both mentioned staying humble and taking others into consideration. By all accounts, all of the mentor profile narratives which we analyzed incorporated valuable information to which students could likely relate; it is not a question of whether the profiles were relatable, but instead relatable to which students and how relatable.

### *C. High-Impact Role Models Versus High-Impact Mentors*

Overall, high-impact profiles from both role models and mentors included more text and went into more depth than the low-impact profiles for the same group. This greater level of depth showed up in answers to the majority of the questions used to create the profiles for both groups. Although there were some low-impact profiles that included a few in-depth responses, this overwhelming similarity between the high-impact groups indicates that longer, more complete, narratives are better received by student viewers of the profiles overall.

In terms of notable thematic similarities, high-impact profiles shared common themes of giving back to others and a focus on some self-transcendent purpose such as making the world a better place. In addition, both high-impact groups had at least one profile which included mention of paying kindness and support forward in some way. Both high-impact groups engaged in "real-talk" about the challenges they faced and their failures as well as the jarring experience of cultural isolation and the immenseness of college life. High-impact profiles included more honest expressions of failure and recovery from failure with longer chains of reasoning around those failures (e.g., starting with the root cause of the failure, describing the failure event, expressing the emotional response to the failure, showing awareness of the recovery process, etc.). These detailed displays of humility around their professional shortcomings coupled with earnest desires to contribute meaningfully to the wellbeing of others seemed to strike a chord with student viewers more so than the low-impact profiles which lacked these same features for the most part.

### *D. Low-Impact Role Models Versus Low-Impact Mentors*

To build on the themes touched on in the high-impact comparison above, the most striking similarity between low-impact profiles from role models and mentors was the absence of the idea that "failure is a process." Low-impact profiles were more likely to distance the role model or mentor from the failure, to view the failure as an isolated event that just happened without context, or even to assert that they had never experienced failure (in the case of some low-impact role model profiles). This lack of description around the process of failing, learning from one's mistakes, and recovering may make the low-impact profiles less motivational and/or relatable to student viewers overall.

## IV. CONCLUSIONS AND FUTURE DIRECTIONS

Our analysis suggests that longer profiles that include mentions of giving back for self-transcendent reasons, honest and robust descriptions of failure and success, and acknowledgement of the challenges of college life are more likely to be "impactful" (as defined in this study). Subsequently, revising the profile generation process to highlight these aspects might increase the likelihood of profiles being high-impact for URM students in STEM. Our future work will focus on obtaining direct measures of impact of mentor profiles through mentee interviews, as well as exploring student reactions to tailored "high-impact" vs. "low-impact" variations of the same profile. Through deeper understanding of student reactions to profiles we can better define and characterize "high-impact" in both contexts and optimize the leveraging of this simple intervention to support URMs in STEM across further contexts.

### ACKNOWLEDGMENT

We would like to thank the Department of Electrical and Computer Engineering, the College of Engineering, and the Presidential Fellows Program at Bucknell University for funding that supported the role model study work. We would also like to thank our study participants, as well as the Offices of the Registrar, the Associate Provost for Diversity and Inclusion, Development and Alumni Relations, and the Provost; and the Center for the Study of Race, Ethnicity & Gender at

Bucknell University. For the mentor work specifically, we would like to thank all of the mentors who provided profiles to support their students, Professors Kalyani Madhu and Michael Clark, and the Center for Excellence in Teaching and learning for their endorsement and continued assistance with our studies.

#### REFERENCES

- [1] National Science Foundation (U.S.), "Women, minorities, and persons with disabilities in science and engineering," Women, Minorities, and Persons with Disabilities in Science and Engineering, 2019.
- [2] N. Aish, P. Asare and E. Miskioğlu, "People like me: Providing relatable and realistic role models for underrepresented minorities in STEM to increase their motivation and likelihood of success," in Proceedings of the IEEE Integrated STEM Education Conference (ISEC), March 2018
- [3] K. Trenshaw, N. Aish , P. Asare , and E. Miskioğlu, "Leaders Like Me," Proceedings of the Collaborative Network for Engineering and Computing Diversity (CoNECD), 2019.
- [4] K. Trenshaw, P. Asare , E. Miskioğlu, and D. Rushton. "What's in a story? Comparative analysis of role model and mentor profiles," Proceedings of the Association for Engineering Education Conference (ASEE), 2020.
- [5] S. Zirkel, "Is There a Place for Me? Role Models and Academic Identity among White Students and Students of Color," Teachers College Record, vol. 104, (2), pp. 357-376, 2002