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Intermediate Composition 2089

Ethnography Rough Draft 2

13 April 2016

An Ethnographic Analysis of Minorities Pursuing STEM Careers

The world is currently in the era of advancement, and with advancement comes more individuals interested in science, technology, engineering, and mathematics (STEM), but shouldn’t the demographic within those fields be increasingly more diverse? The world becomes more diverse each day. However, only 29.5% of African-Americans and Latinos make up the STEM field workforce (National Science Foundation). It has always been important to have increased diversity within every career field, but it is especially important in the STEM fields. Having diversity brings about different perspectives and approaches which can help to advance the current science and technology fields. Previous research has been conducted about the reasons why minority students may not have the opportunity or want to pursue STEM careers, but this ethnographic analysis focuses on a specific discourse community of minority students who attend a university in the Midwest. Minority students have the ability to make contributions in the STEM field along with anyone else who has a unique and beneficial idea to improve society’s advancement.

The discourse community to be examined is the Louis Stokes Alliance for Minority Participation (LSAMP) here at the University of Cincinnati. LSAMP is a scholars program consisting of under-represented minority students pursuing undergraduate careers in STEM fields. The discourse community is unique because it has been around for about thirty years at the University of Cincinnati, even undergoing a name change from Emerging Ethnic Engineers (E3) to LSAMP. The scholars program has also broadened its membership from solely including minority undergraduate engineer students to all minority undergraduate students in any science or math major. The Louis Stokes Alliance for Minority Participation is a National Scholars Program that is found at a multitude of different universities across the United States. The program is named after Louis Stokes, the first African-American man to represent Ohio and the first African-American to win a seat on the House of Appropriations Committee. With his immense success the U.S. House of Representatives, Stokes’ goal was to increase the amount of opportunities available for millions of African-Americans (History, Art, & Archives). The goal of the scholars program is to provide resources and programming for minority students, while also encouraging them to conduct research, maintain a 3.2 GPA, and give back to the community by volunteering in STEM-based community service. To become a member of the program it is a slightly selective process; one must be an under-represented minority, pursuing an undergraduate degree in a STEM field, and have excellent academic standing.

In the article entitled “The Concept of Discourse Community” by John Swales, a professor of linguistics at the University of Michigan, he mentions that there are six defining characteristics that are necessary to identifying a group of individuals as a discourse community. The first characteristic named by Swales, is that the community “has a broadly agreed set of common public goals” (Swales 220)*.* The goal of the discourse community is to provide resources and programming for under-represented minority students pursuing undergraduate degrees in STEM fields. STEM fields are often traditionally challenging courses, so to ensure that students are well-prepared for the course work, the discourse community members undergo a seven-week, academic-intensive summer program before the start of their college career. By having access to the summer program, students become aware of what is to be expected of them before actually entering their first year at the University of Cincinnati. In addition to the summer program, students have access to an LSAMP advisor as an additional resource. The LSAMP program inspires minorities to continue pursuing a degree in STEM throughout their college career.

Due to the motivation the LSAMP program provides, members of the discourse community have an opportunity to further dispel the stereotypes that exist for a minority student in a STEM field. The stereotypes that exist range from minorities not being smart enough or unable to handle the challenge that STEM fields present. Henry Louis Gates Jr., a historian and college professor, conducted an interview with Claude Steele entitled, “A Conversation with Claude M. Steele: Stereotype Threat and Black Achievement”. Claude M. Steele, a social psychologist examines the relationship between minorities and stereotype threat:

Stereotype threat is a very simple experience that everybody has, I believe, a couple times a day. It refers to being in a situation or doing something for which a negative stereotype about one of your identities--your age, your race, your gender--is relevant to you. You know then that you could be seen and treated in terms of that stereotype. And if you care about what you're doing, the prospect of being judged and treated this way can be upsetting, distracting, and can interfere with your functioning in the situation. (Gates, 2009)

As a minority in a STEM major, there is the possibility of encountering stereotype threat because not many minorities are pursuing STEM degrees at the University of Cincinnati. Also, having no real diversity placed on this “homogenous setting” can be uncomfortable (Gates, 2009). By having a discourse community, such as the LSAMP program, the students are surrounded by individuals that have the same goals as they do and share the same or similar ethnicities. As Steele states, “People with minority identities in this situation can feel like they belong and maybe succeed” (Gates, 2009). Having access to the LSAMP program at UC allows for the possibility of stereotype threat to be diminished. In a broad sense, minorities pursuing STEM careers have to deal with the cost of affiliation, which occurs when individuals must make major decisions that create personal or social distance between their family and community, in order to fit into the discourse community (Johns 511). Minority students within the LSAMP discourse community would not have to necessarily struggle with the cost of affiliation because they are combating stereotype threat together. The cost of affiliation no longer becomes a threat or problem for the discourse community.

Within a discourse community, there are “mechanisms of intercommunication among its members” (Swales 221)*.* The modes of intercommunication within the discourse community is through weekly emails, or once a month socials or meetings. At each monthly meeting, students undergo programs given by guest speakers from a variety of offices at UC who offer information about opportunities geared toward students pursuing STEM careers. The talks can provide information about research, internships, co-ops, or basic networking or professionalism advice. Often times at each social, there is a chance for LSAMP members to interact with each other, faculty, and LSAMP advisors. I attended a social earlier this year and had the opportunity to observe the group dynamics. There is a range of ages within the discourse community, from freshman to senior undergraduate students. The theme of this social was about networking, and how to network efficiently. The demographic of this particular social was primarily freshman and sophomore students, with 60% of the students in Arts and Sciences and the other 40% in engineering majors. There was a total of about twenty-five students in attendance at the meeting. As I observed, I noticed that the freshman students seemed to interact more with other freshman than with sophomore students, and vice-versa for the sophomore students. It seemed as if each class was more comfortable interacting with other students in the same class as themselves. This could be because each class went through the seven week summer program with each other and therefore share more of a connection. However, when the social called for collaboration, the freshman and sophomores collaborated effectively with one another. Overall, the students seemed to gain a lot of information from the guest speaker about how to network and to build up their list of mentors. In attendance was the director of the meeting and the LSAMP advisor for Arts & Sciences majors. It was clear that both the director and LSAMP advisor interacted well within the discourse community, considering that they both hold positions of authority. Having access to resources provided by guest speakers helps to advance students within the field of STEM.

To be classified as a discourse community, it is important to use different methods to provide information and feedback” (Swales 221). The discourse community holds all of its members responsible for upholding the required standards. In an interview that I conducted with Francesca Smitty (not real identity), a sophomore, medical laboratory sciences major, and member of the LSAMP scholars program, she described an experience that she encountered at the University of Cincinnati:

I noticed that I had all of this great support and abundance of resources available to me as an LSAMP Scholar, but whenever I would step out of this group it became clear that there was not an availability of resources at my disposal. It was harder to become connected to faculty and professors within my field or even to find research opportunities when not working with my LSAMP advisor. I feel as though because I am a member of this group it has provided me with opportunities that I would otherwise not have access to as a minority student majoring in a STEM field at this University. (See Appendix A)

Each member is to meet with their LSAMP advisor two times a semester and to do fifteen hours of STEM based community service per semester. In addition, each member must visit their professors and have them fill out a midterm evaluation form per semester. This allows for the LSAMP advisor to monitor the students’ progress and to determine if any student needs any additional help with a class. Having an advisor allows for each member to ask questions if they need any help or want advice on securing summer research or an internship during the school year. The advisor is able to provide any insight and be a source for the member to look to if they are finding that pursuing a STEM field can be difficult.

As a discourse community it is important to incorporate different genres to account for its specific aims” (Swales 221*).* The discourse community in question focuses on four major genres: research, professionalism, networking, and academics. Each genre is specifically addressed during each meeting, regardless of the meeting’s content. As a member of the LSAMP program, it is important to understand and utilize the genres accordingly, especially within the field of STEM. Members are expected to conduct research and maintain a 3.2 GPA, while also being able to network professionally with professors and faculty in the STEM fields. A member of the LSAMP scholars program, Brittany Chin, a sophomore neuroscience major, recalls a time when she truly benefited from the discourse communities’ use of the research genre:

Knowing and having a relationship with advisors and professors before school started was beneficial. I work in a lab with my mentor Megan Lamkin, who was our biology teacher for the summer. If it was not for the LSAMP program I would not have started research my freshmen year as smoothly as I did. (See Appendix B)

Although a lot is required of its members, the discourse community provides opportunities for members to conduct research, have access to tutoring for classes, and develop relationships with professors and faculty members at the University of Cincinnati. The amount of support that is available for LSAMP scholars is immense and it encourages students to continue in STEM majors throughout their college careers.

Within a discourse community there is a specific lexis shared with all members” (Swales 222*).* In the LSAMP scholars program the lexis is not distinctly different from other discourse communities, but often includes language related to the engineering or science fields. This includes the use of many acronyms such as LSAMP, STEM, Co-ops, or A & S to name a few. From an outsider, the use of these acronyms would be unfamiliar, but to a current member of the discourse community it would be known that A & S refers to students in the McMicken College of Arts & Sciences, or that Co-ops are internships that engineering students begin their sophomore year of college. Along with having particular jargon geared toward the discourse community, the lexis fosters group dynamics and allows for the group to feel closer. It is easy for other LSAMP scholars to network with other LSAMP scholars because of the lexis that is used within the discourse community. The use of the lexis also helps with the flow of meetings, as the acronyms do not have to be explained each time that they are mentioned. In contrast, the relationship between member and professor is often affected by the discourse communities’ lexis, because many professors at the University of Cincinnati are not aware that this discourse community exists. It must be explained by the member what the discourse community is, what the communities’ goals are, and how those goals are accomplished.

Another characteristic is that a discourse community has particular levels of authority and each member can provide a “suitable degree of relevant content and discoursal expertise” (Swales 222).The discourse community is different from other organizations at the university in the fact that it is not student-led, but faculty-led. The authority is held by the director of the program and the LSAMP advisors, who are all faculty at the University of Cincinnati. Even though the program is faculty-led, students are still encouraged to participate or voice their opinion on anything that they believe needs to change within the discourse community. Having a faculty-led organization can be more advantageous than a student-led organization for a discourse community like the LSAMP scholars program, because faculty have insight and have developed relationships with professors in STEM fields who can help assist the students throughout their college careers. Members will be able to possibly network more effectively if their LSAMP advisor, for instance, already has a relationship with someone that they would like to talk with about a certain career within STEM. Faculty also share a different view or approach to an idea than a student may and this fosters diversity within the discourse community.

The world is continually becoming more and more diverse, so because of increasing diversity all career fields need to embody this aspect of diversity. However, as technology advances having diversity within the STEM fields has become more important. As a student at the University of Cincinnati, I have observed first-hand the lack of diversity within both the university as a whole and within the STEM fields. The discourse community that I have examined, upholds Swales’ six characteristics of a discourse community, while also having the opportunity to increase the amount of under-represented minorities in the field of STEM. The LSAMP scholars program is able to incorporate its own genres and literacies to developing a community of minority students dedicated to overcoming any challenges and remaining inspired to continue with their STEM education.

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Appendix A

Interview with Francesca Smitty (not real name)-unedited

Q: What challenges, if any, have you faced as a minority in a STEM field?

A: Umm, as far as any challenges go I have faced one main challenge I think. I noticed that I had all of this great support and abundance of resources available to me as an LSAMP Scholar, but whenever I would step out of this group it became clear that there was not an availability of resources at my disposal. It was harder to become connected to faculty and professors within my field or even to find research opportunities when not working with my LSAMP advisor. I feel as though because I am a member of this group it has provided me with opportunities that I would otherwise not have access to as a minority student majoring in a STEM field at this University.

Appendix B

Interview with Brittany Chin-unedited

Q: Why did you decide to pick a STEM major?

A: I choose a STEM related field because I have always had an interest in science related topics. Throughout high school I looked forward to taking upper level biology classes and still do in college. My aunt is a psychiatrist who specializes in pain management and it has always been fascinating to listen to her talk about the science behind why people feel the pain they feel, whether it be neurological or physical.

Q: What challenges, if any, have you faced as a minority in a STEM field?

A: I cannot think of anything at the moment.

Q: How have you benefited from the discourse community genres of professionalism, academics, networking, and academics?

A: Professionalism:

Research: Knowing and having a relationship with advisors and professors before school started was beneficial. I work in a lab with my mentor Megan Lamkin, who was our biology teacher for the summer. If it was not for the LSAMP program I would not have started research my freshmen year as smoothly as I did.

Academics: Through the LSAMP program I have formed bonds with fellow classmates. I did not have to go through the process of finding a group of people who would want to study, but already had that group established from the summer. This has helped me since the summer program in my studying skills and academics. This group of people also has a similar mind set and goals when it comes to academics, making it easy to get along and keep focused.

Networking: The LSAMP program created a support system of advisors that we can reach out to. Summer teachers also created a network in that many of them know UC professors and faculty. This then allows us to communicate with others outside of LSAMP and still have that connection within the group.