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Introduction and Related Literature

Women are accessing higher education at higher rates. Studies indicate that women scientists and engineers are more likely than men to have attended a community college at some point in their academic career (Tsapogas, 2004). The majority of the literature on transfer focuses on GPA and quantitative measures of academic performance while students are at the 4-year institution “as a proxy for integration” (Townsend & Wilson, 2006, p. 441) and “almost none of it has been conducted on students once they transfer to another institution” (Townsend & Wilson, 2006, p. 441). There has been some concern regarding the academic success of individuals who transfer between two-year and four-year institutions. The literature indicates that individuals who attend community colleges prior to a four-year institution perform as well if not better than their counter parts that went directly to a four-year institution (Lee, Mackie-Lewis & Marks, 1993). Students who transfer from a two-year institution may experience “transfer-shock,” which occurs when students experience a dip in their grades after transferring to the four-year institution (Laanan, 2006). Moreover, the literature has recognized community colleges as great avenues to foster STEM aspirations among women. Women scientist and engineers are more likely than are men to have attended a community college at some point in their academic career (Tsapogas, 2004).

Purpose

The purpose of this study was to explore the experiences of female transfer students majoring in STEM areas at a midwestern university. This study takes into account the early background influences as well as the pre- and post-transfer experiences of female bachelor degree seekers. Thus, this study seeks to understand how female transfer students navigate and make meaning of the transfer process.

Research Questions

- How do students describe their early influences regarding people, places, and experiences that impact their early interests in STEM majors?
- How do female transfer students describe their academic pre- and post-transfer process?

Methodology

A phenomenological approach was employed for this qualitative study. The current study was designed to explore the lived experiences (Creswell, 2007) of female transfer students in STEM majors. The study sought to explore early social influences, academic experiences (pre- and post transfer experiences) of female transfer students in STEM majors. Constructivism suggests that “meanings are constructed by human beings as they engage with the world they are interpreting” (Crotty, 1998). The goals of this investigation included the exploration of the phenomenon of female transfer students in STEM majors. More importantly, female community college transfer students would be able to freely describe their experiences as a female in a STEM major in their own voice. The research team consisted of graduate students who assisted the principal investigator in this research project, both with the initial interview and with the subsequent content analyses of the collected data.

Theoretical Framework

Cultural and social capitals are appropriate to consider when discussing transfer students. **Cultural capital**, more specifically, the institutional state of **cultural capital** refers to the educational attainment and the “unequal scholastic achievement of children originating from the different social classes by relating academic success” (Bourdieu, 1985, p. 243). **Social capital** is different but related to **cultural capital** in that social capital is “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition (Bourdieu, 1985, p. 248). **Social capital** exists in relation to a variety of different entities and persons and facilitates the production of activities.

Findings

Early Social Influences

Family and friends

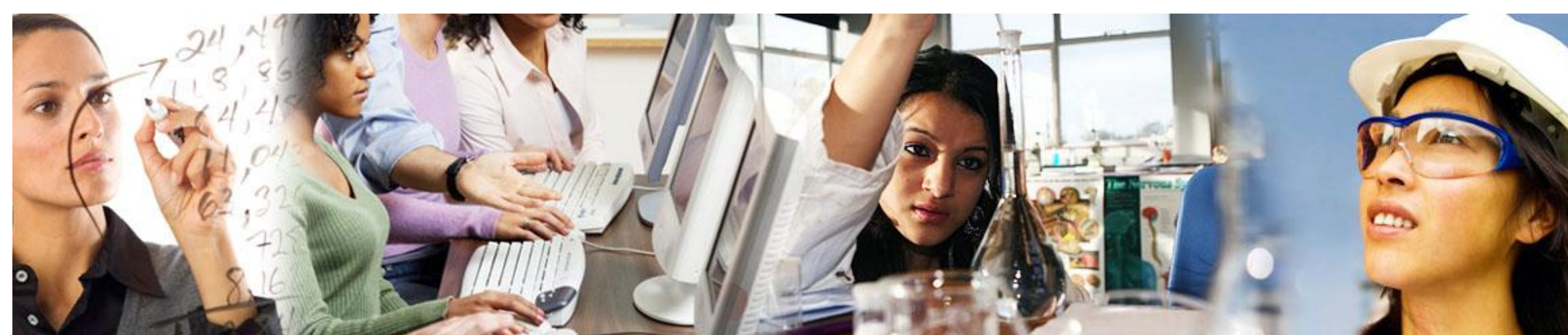
“My mother is a nurse, which is sort of related to microbiology as far as health goes. There is always the famous scientist that I looked up to, that sort of made me want to pursue a career in science... Marie Currie, I've always admired [her] and then of course Albert Einstein, Robert Koch, a famous microbiologist.”

Personal interest

“The factors that influenced my choice for my majors were things like, well I always like to eat healthy and I always enjoyed being in the kitchen and I, I enjoy using the new products that they had available as far as low calorie, low fat products out in the market and I thought it would be really fun to try and find a way to feed people nutritious food that also tasted delicious.”

Work opportunities and experiences

“I came to the choice to major in agronomy kind of by chance. I was working in a restaurant that served a lot of local foods and I met a farmer who had a CSA and she was willing to let me work on her farm to pay off some of the cost of the vegetables that I wanted from her. After working on her farm I saw how much food she, by herself, produces for her community and how she respects the land and, um, really that a farm doesn't have to be hundreds of acres of row crop really and the diversity that it can have and that interest me a lot.”



Community College and University Classroom Environments and Influences

Why begin at the community college?

“One of the reasons that I went to [community college] besides wanting to stay home with my son was I wasn't really sure where my interest were lying. I knew that I was good at science but I didn't know what aspect of science. So I took some conservation classes and some biology classes and chemistry to really narrow the field, really figure out where my interests were lying.”

Why get involvement at community college?

“I got involved in Phi Theta Kappa, the Honor Society for Community Colleges. They had some really nice sessions where they would get some representatives from a university and then have them come and talk about college and transfer and I got into contact that way with a lady who was a representative from (Midwest) State University. She was really helpful with the transfer process and encouraged me to look into it and see what would transfer and try to make it as smooth of a transition as possible.”

Why transfer?

“I decided to transfer to (MSU) because (MSU) has a great reputation for the sciences, especially the life sciences, than the College of Agriculture. I also like the idea that in the surrounding communities there are so many job opportunities and internship opportunities at the USDA (MSU) research park, veterinarian medicine hospital and just so many other private firms in Des Moines.”

The Role of Faculty and Staff

From community college...

“The faculty were actually really helpful. I was really close with about three or four of them. They were always willing to give me their input when I asked them and weren't afraid to tell me what they thought of what I could do.”

Findings continued....

“My Phi Theta Kappa advisor, I was secretary for our honor society, was the biggest help. She was always there. I met with her everyday and we'd talk and she knew where I was going and she always told me where else to go. I think she was probably my biggest influence. She was actually a math professor though. So she really didn't know about life sciences too much. My chemistry professor was also really helpful and my biotechnology professor was really helpful. The all kind of came together and pretty much just push me forward.”

From university...

“To transfer out to (Midwest) State it didn't take me very long to adjust academically, or socially. I had three really good roommates that I did not know before transferring and they would keep their eyes open for stuff that they would see on campus saying, “Tina there's a pre-physical therapy club meeting tonight, you should go.” That helped. It was a little bit different from the community college where I felt like I didn't have to work very hard. But then out here it was like you definitely need to study more, you need to spend more time. After I figured that out it was smooth sailing, I'm fine now, so.”

“My academic advisor really did help me adjust and get started at (Midwest) State.”

“Definitely my academic advisor was really helpful. He gave me suggestions on what classes to take and if I wanted to do an internship, and if I had any questions about anything. All of my professors were really, really friendly and really nice. You could just go knock on their door and they would give you the run down on whatever problems you had.”

Conclusion

- We saw a contrast between the level of adjustment to a 4-year university for students. While some students viewed the adjustment process as easy, other students viewed the process as a little difficult.
- We observed the differences in the “embodied” cultural capital among these students.
- We also observed that these female STEM transfer students knew the benefits of gaining social capital by engaging with faculty and being active at the university. In other words: the more social capital a student possesses, the smoother their adjustment process is at the four-year university.
- These academically competitive female STEM transfer students recognized their cultural capital, which was constructed by their early social influences and formal education.
- Lastly, we observed that female STEM transfer students who experienced differential treatments in the learning environment also experienced it in a variety of ways.

Implications for Future Research

- The findings have particularly important implications for policy and practice in that understanding the experiences of female students in STEM majors will assist student affairs professionals in providing the necessary resources and initiatives to ensure retention and ultimately graduation of female STEM majors.
- Additionally, this understanding sheds light on how women experience their academic environments and the effects that academic environments have on the view of what it means to be in a STEM area. This understanding will also highlight specific retention efforts that should be implemented. Comparable studies at other sites can assist in establishing the transfer of results.