ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

Paper ID #36461

The Unheard Voices of Administrators who are Non-traditional Graduate Students in Engineering and Computing Education

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Introduction

According to the National Center for Science and Engineering Statistics' Survey of Graduate Students and Post-Doctorates in Science and Engineering, enrollment of part-time students, who are citizens and permanent residents, in U.S. graduate programs has increased and so did across the other enrollment categories (Davies et al., 2022). The increase, however, was not consistent across demographic categories or degree types as the number of full-time temporary visa holders decreased at the master's and doctoral levels (Davies et al., 2022). First-time, full-time enrollment declines caused by the pandemic are anticipated to affect long-term trends, particularly at the Ph.D. level (Davies et al., 2022). These trends and shifts in enrollment have the potential to change not only the doctoral student demographic landscape, but also impact the structures and systems within higher education. As such, there is an increasing need to explore the backgrounds and motivations of this increasing part-time student population for pursuing a doctoral degree and their experiences within graduate school.

Most of the research on the Ph.D. student experience has concentrated on full-time students, often excluding the increasing population of part-time students. Gardner and Gopaul (2012) suggest that the scarcity of literature on part-time Ph.D. students in the U.S. may be related to three challenges that are unique to this group. The first challenge is difficulty in defining what part-time doctoral study means and who is a part-time student (Gardner and Gopaul, 2012). This challenge emerges because students in the U.S. may temporarily switch classifications between part-time and full-time throughout their program (Gardner and Gopaul, 2012). The second challenge arises due to how enrollment status is defined, as it could be defined differently at different institutions (i.e., the number of credits enrolled in). For example, graduate students enrolling in 9 or more credits at one institution could be classified as full-time; anything less would be categorized as part-time. While a different institution could define part-time status as someone enrolled in 5-6 graduate credits, which is less than the half-time enrollment requirement. Finally, due to the above-mentioned, there is a challenge in determining how many Ph.D. students are enrolled part-time at any particular moment (Gardner & Gopaul, 2012). However, even though existing data sources cannot offer a complete snapshot of these students' headcount in graduate programs, the Council of Graduate Schools suggest that they are a growing population that ought to be explored (Gardner & Gopaul, 2012).

Of the research on part-time doctoral students, these students have been shown to be less engaged in their studies, less satisfied with their Ph.D. experiences and viewed as less motivated than their full-time student peers (Gardner & Gopaul, 2012). Studies have found factors that limit the participation of these part-time students include socialization barriers, structural constraints, negative encounters, feelings of otherness, feelings of being treated less favorably than traditional students, longer completion time, and beliefs of not having the same opportunities as their peers (Graham & Massyn, 2019, p.192). Furthermore, part-time students are less likely to be socialized or integrated into their academic unit, which results in them experiencing feelings of lack of support from their departments and poor relationships with their advisors (Turner, 2023). In addition, those who were part-time students found it difficult to secure graduate

admission as many engineering doctoral programs do not admit applicants on a part-time basis (Schilling, 2008). This can be attributed to faculty's perception of part-time students being less scholarly and dedicated to their graduate studies (Turner, 2023). Not to mention, for part-time students without access to tuition reimbursement, there are further barriers as they are competing for grants and fellowships available, of which there is a shortage, with full-time applicants (Schilling, 2008). The above-mentioned indicates that there are quite a lot of difficulties part-time students may face during their graduate journey that may not be visible but can have effects on their graduate experience.

There is a growing need for individuals with analytical and applied research skills in the knowledge-based economy. This knowledge-based economy is characterized as having a reliance on knowledge, information and high analytical or technical skills (OECD, 2005). These attributes are typically associated with experienced individuals with Ph.D. educational levels (Cross, 2014). Thus, as a result, professional or non-traditional doctorate programs that support non-traditional students have arisen as one option for providing these skilled individuals the education to keep up with the demands of this knowledge-based economy (Cross, 2014). As such, flexible part-time curricular designs that combine both synchronous and asynchronous learning are required to accommodate these non-traditional students (Cross, 2014). Without understanding the needs of this increasing group of students, the shift in curricula might not account for their needs as non-traditional learners.

Prior employment and life experiences, or experience capital, substantially impacts how professional non-traditional students engage in their Ph.D. program (Strutz et al., 2011). When examining professional non-traditional students, Strutz et al. (2011) explain that their experiences intersect with their personal, cultural, economic, and symbolic capitals. According to findings from the same study, professional non-traditional students have better-formed habits and significant capital, which prepares them well for their graduate program and thus has a major impact on their engagement during their Ph.D. program (Strutz et al., 2011). Given this preparation, further exploration is needed to understand what in their experiences within these programs is causing lower levels of engagement.

Purpose

While persistence, retention, and graduation rates remain key topics of discussion across several graduate-level studies, there is limited research on part-time students, particularly those fully employed. With the rise in the enrollment of these professional non-traditional students, a deeper examination of this group within graduate education research becomes critical, especially considering that only a few studies concentrate on their motivations and experiences. The results of these examinations can support graduate programs to make further changes to the design and delivery of their doctoral curriculums by accounting for the unheard voices of these non-traditional students and raising awareness of their lived experiences throughout their program.

In this paper, we describe the preliminary results of a collaborative autoethnographic exploration of the professional and educational experiences of two professional non-traditional doctoral students in engineering and computing education. We define professional non-traditional students as part-time learners who are still practicing within their professional fields (Benekos et al., 1998) and are differentiated by the breadth of their personal and professional

experiences. Part-time students are typically defined by the institution's enrollment status standards which are based on the number of enrolled credits each term. In this paper, part-time status is defined as having enrolled in less than 9 graduate credits. In navigating this graduate program, the authors came together over shared experiences and questions about what it means to be a part-time doctoral student in a program and discipline that predominantly enrolls full-time doctoral students. As such, this study seeks to answer the following research questions:

> RQ 1: How have their goals, as non-traditional students, evolved as they have transitioned into a doctoral program?
>
> RQ 2: What factors impact the agency of individuals pursuing their goals in dual roles, as doctoral students and higher education administrators?

In the sections that will follow, we will discuss the framework used to guide this study, followed by the methodology that was utilized. We then analyze the findings and conclude with a discussion on the implications and future research work.

Conceptual Framework

According to the social cognitive theory, people influence their own motivations and actions within a given system, and thus Bandura (1989) explains how "this model of reciprocal causation, action, cognitive, affective, and other personal factors, and environmental events all operate as interacting determinants" (p.1175). In Bandura's (1989) examination of the nature and functions of human agency, he uses the cognitive, motivational, affective, and selection processes to describe how one might exercise personal agency through self-belief or efficacy. By grounding this study in Bandura's definition of human agency, we will make visible how these graduate students exercise their agency while acknowledging the institutional limitations (i.e., environmental events) and oppressive systems (i.e., racism, sexism, and other isms) that they may have experienced. Given that this paper seeks to identify factors that impact agency of non-traditional student's agency, we analyze their lived experiences as students and administrators through the lens of doctoral student and professional agency. (Strong's Paper)

Sweat et al. (2021) define a doctoral student's agency as "the belief in one's ability to take the initiative necessary to assume an active role in one's learning setting, content, process, and engagement" (Rigler et al., 2021, p.206). Agentic individuals can recognize present needs, visualize goals, and aims, and convert those needs and objectives into beneficial activities (Goller and Harteis, 2014). Goller and Harteis (2014) explain how the concept of 'Professional Agency,' defined as "the general capacity and disposition to make intentional choices, to initiate actions based on these choices and to exercise control over the self and the environment" (p.5), may be used to understand and examine how motivation and self-direction are realized. Being that the focus of the study is on non-traditional students, the utilization of properties of human agency as described by Bandura (2006) will help reveal the motivations and interests, goals and outcomes, action plans and self-regulators, as well as self-reflection and evaluation of these non-traditional students who are pursuing a doctorate while working full-time.

Methodology

This study seeks to identify factors that impact the agency of individuals pursuing their goals in dual roles, as doctoral students and higher education administrators, by analyzing their lived experiences. To explore this phenomenon, we employed the qualitative research method of collaborative autoethnography (CAE) using a conceptualized framework of doctoral student and professional agency as defined by Bandura (1989) and Sweat et al. (2021). The first two authors were the participants in this study, given their dual roles and their desire to develop a foundation in our field's understanding of the doctoral experiences of students in similar dual roles.

CAE is the combination of three research methods and approaches: *autobiography*, the study of oneself, *ethnography*, the study of culture, and *collaboration*, the study of the group. This trilateral method allows researchers to utilize self-reflection to ascertain cultural themes across their similar identities. Throughout this process, the researchers play dual roles as participants to collaboratively interrogate their experiences and perspectives. Given these dual roles, it was very important for them to continuously be aware of their own biases and to accurately represent the identities and lived experiences of the targeted population within the data collected. In particular, the first two authors used existing data sources, each other's statement of purposes and first-year professional development written reflections, as a starting place to explore commonalities and differences in the experiences. By cooperatively grappling with the perspectives of their authentic written history they sought to discover the meaning of them as they relate to non-traditional graduate student agency.

Positionality

Since two of the researchers were in fact participants in the study, it is important to discuss our roles and relationship as it relates to the topic of study. All authors identify as women who are conducting research in engineering and computing education at a Hispanic Serving Institution (HSI). This is where our identities diverge. The co-authors include two current part-time doctoral students who also serve as administrators. Morgan H. McKie is a queer black woman currently a 2nd year doctoral student working as an administrator within the online department focusing on technical development and services for the learning management system. Mais Kayyali is currently a 3rd year doctoral student working as an administrator within the areas of Graduate Education and Admissions. Dr. Alexandra Coso Strong is an assistant professor of engineering education who works and teaches at the intersection of engineering education, faculty development, and complex systems design.

Study Process

In the first phase of the study, the first two authors conducted an analysis of each other's experiences regarding the evolution of their professional and personal goals as they transitioned into a doctoral program through deliberations of their statement of purposes. Each researcher read the others' statement of purpose to isolate key areas that influenced their professional goals for pursuing a doctoral career. In a recorded collective reflection, based on the key areas identified, researchers discussed the questions below and completed a textual analysis of their responses:

1. Describe what persuaded you to pursue a doctoral degree?
2. How did your role as an administrator impact your choice to pursue a doctoral degree?

3. Now that you are within a doctoral program, were there any major changes to your professional and personal goals? If so, what factors influenced these changes?

In the second phase of the study, the first two authors conducted another analysis of each other's experience regarding factors that impacted their agency through the review of first-year reflections written in their professional development course. The same process of reading each other's written history was employed. This time, they focused on key situations and contexts that advanced their professional and personal goals. In a recorded collective reflection based identified key situations and contexts, they discussed the questions below and completed textual analysis of their responses:

1. What factors motivated you throughout your first year of the doctoral program?
2. How did you balance coursework, work, and personal life?
3. How did your experiences within the program impact your work as an administrator? And vice versa?
4. What were your academic and professional goals? How did you strategically set up these goals? What was the outcome?

From their collective sense-making, they were able to do a thematic analysis of their responses. As a result of this analysis, emerging themes were categorized for further analysis, providing a useful foundation for further studies. As part of the analysis, the data was carefully read, reread, and coded, to be categorized (Bowen, 2009). In the section that follows, we discuss the themes that emerged.

Findings & Discussion

At the beginning of this research, we sought to explore our lived professional and educational experiences as administrators and non-traditional doctoral students in engineering and computing education. From our collective reflections and analysis, five emergent themes materialized: (1) time, (2) support systems, (3) emotional intelligence, (4) dual identities, and (5) autonomy.

Time

We found that as doctoral students and administrators, we must manipulate time to best facilitate the completion of all our responsibilities. In doing so, we align our administrative goals with our coursework. It is a unique balancing act of competing interests. This is seen in McKie's review of an academic leader that they emulate:

> ***McKie – Course Reflection****:* [Academic Leader] *is still one of those people I look up to. I started an MFA, and I didn't finish it because I wasn't going to pay for that because I started working at another university where it was being paid for through my benefits. But he was someone I really admired, because up to this day, he's the director of a whole department or school. I still have to figure out the hierarchy of things. I'll figure it out when I get my President position, but he is juggling so much. I admire that. In this day and age, I have a lot of friends who are like you're doing too much. For instance, my sister, she's always like "You're going to overwork yourself and overwhelm yourself." But I like the juggling act when it's valuable to me.*

On the other hand, as part-time students, we have ownership of our time, thus, our time is not contingent on the influence of other factors such as funding. As administrators at the institution we attend, we receive a tuition waiver that covers a large portion of our tuition fees. This type of funding source gives us control over how we use our time but limits us in attaining outside funding.

> ***McKie – Collective Discussion:*** *I received a doctoral fellowship. They told me [to receive the funding from the fellowship] I couldn't work [in my current role as an administrator]. The fellowship, I believe, is tuition and a $12,000 stipend per academic year. Which was less than what I was making at the time. So, I asked, "Can I work?" Because that information was not on the website. Usually, I will tell you straight up if I'm trying to skirt tail something. If I'm trying to find a loophole. This was not the case! That information was not provided. So that's one thing, I believe, is a drawback to a lot of these fellowships. They tell you. They mandate all these things, but then don't give you a livable wage.*
>
> *So, I pushed, and it went all the way up to the head of HR. It came down to them saying, no. I was highly upset because this fellowship is based on merit. It's not based on your financial status. It's based on merit. I won that fellowship. They awarded me that fellowship based on my merit.*

Support Systems

Because our time as part-time students is limited, we seek to take advantage of support systems that are built into coursework to set and accomplish our professional goals. This phenomenon is best showcased in Kayyali's professional development reflection where they were introduced to an Individual Development Plan (IDP):

> ***Kayyali – Collaborative Discussion:*** *In an IDP you identify your skills, your goals, and things that you want to work towards. Going into college, doing my bachelors and masters, I never really felt like I had somebody, or a mentor, or anybody that could potentially help me in terms of career planning and things like that. I kind of did my own thing, I never really had to see my advisor like at the undergraduate level until I needed to take a class that required a prerequisite that I didn't want to take. Then at the graduate level, I only saw my advisor when I first started the program, and that was it.*
>
> *So, I did things on my own. The IDP, having to do it as part of the class and in my first semester, made it seem like there were opportunities that would allow me to create that network of people that could provide me that guidance and support. It was what I was looking for, but mainly allowed me to see where I could take my PhD. So, it's more the career side more than anything.*

Emotional Intelligence

The ability to continuously assess our own emotions and reflect on our proficiencies allowed us to persist through our programs of study. Both Kayyali and McKie focus on managing their reactions in the face of adversity to maneuver oppressive environments. Our

awareness of conflicting ideals offered us opportunities to use our emotional intelligence to communicate effectively, empathize with others, overcome challenges, and defuse conflict.

> ***McKie – Course Reflection****: I've had a lot of naysayers in my life. I can count on one hand how many have said, "yay." And on my hands and feet, and your hands and feet, how many have said, "nay". It has been very hard at times. I was about to write about this on LinkedIn, and I was like no. I don't want to be that person, because I have a lot more than some people. I have an edge of privilege that some people don't have. To say that I went to university, just undergrad alone is such a big thing. To say that I completed high school, "I got my high school degree," is such a big thing alone that I also don't want to come off as negative by counting the "nays" and "yays."*

Dual Identities

Our dual identities as doctoral students and higher education administrators were at times hard to traverse due to the understanding, we as administrators had of the institution at large. This knowledge caused us to feel isolated from our full-time peers whose experience of the university was limited to being a new doctoral student.

> ***Kayyali – Collaborative Discussion****: I didn't know how to navigate being an administrator in the same institution, college, as the other students, and not having the STEM background. So, I felt isolated, I think it's because I created these walls. I kind of decided that I should kind of have that wall, not realizing that I could be a student, and I could have that student experience if I only just allowed it to happen.*

> ***McKie – Collaborative Discussion****: I'm going to add to that real quick before we segue away a little bit, but at times those moments of isolation that I've had have been similar. It's not because of my setting myself apart but because of the knowledge I have about the institution. And then my biases for or towards the institution based on that knowledge. This knowledge is what has caused me to feel isolated from the rest of the students. They're only experiencing the institution as a student, and usually they're experiencing it as a student for the first time. We've been here as students and administrators for a while now. And then we been in Miami all our lives. So, we understand the culture of Miami. We understand the cultural context of our institution as an HSI.*

Autonomy

Pursuing a doctoral degree was always part of our professional strategic plans. Throughout our collaborative reflection process, the ideas of value and purpose continuously appeared. A doctoral degree would offer us a level of autonomy within our professional careers that we do not currently have. In particular, in a male-dominated field like engineering, as female administrators, we felt that our degrees would empower our voices.

> ***Kayyali – Course Reflection:*** *That was one of the reasons I wanted to go into the Ph.D. program. Because I felt at my job, I wasn't being challenged. I wasn't really learning anything new. I've learned everything at my job by myself, without the help of anybody. And then I felt like, I want to do all these things, but I don't know where to go from here. Then I figured you know what. Let me see the about a Ph.D. That may create*

opportunities. And if I want to move up the ladder to continue learning and create these impacts, I may need the Ph.D. to get these jobs. That was part of my motivation.

***McKie – Collaborative Discussion**: So, going back to the statement of purpose and like how you said it switched because of the things you know about me now. Yes, the ideal position at that time was a program director of some kind within a School of Engineering or School of Computer Science. Focusing on making sure curriculum and pedagogy are tight. And integrating informal pedagogy into that as well for example experiential learning and Co-op experience. But at the end of my first year my ideal position turned into the president of a university. It was like, "Go, broke, or go home."*

When it comes to the initial purpose and the drive. I still have that, because I remember when we started the program they asked for a little bio, for them to post on Twitter. They were like, "Oh, just tell us about yourself, and why you decided to pursue a PhD program with us." And I wrote that I want people to have that "Ah-ha!" moment. So, the drive and the purpose of me wanting to stay in education, it's still based on facilitating that moment for people. I want students of all ages, undergrad graduate level, to keep on having that "Ah-Ha!" moment and know that learning is not something that you do while you're in high school or undergrad, or even graduate. It's a continuous process.

Implications, Limitations, and Future Work

With the increase in non-traditional student enrollment, a more in-depth analysis of this group within graduate programs becomes necessary. Few studies focus on the impact of their agency for pursuing these advanced degrees and experiences in navigating their dual roles as doctoral students and professionals. In this paper, the authors sought to give a voice to these non-traditional students who are driven to pursue a doctoral degree in engineering and computing education by raising awareness of their lived experiences throughout their program. While this study provides a foundation for future explorations of part-time doctoral students, especially in STEM and STEM education fields, the insights from our own experiences have potential implications not only for engineering and computing education graduate programs but for programs in other disciplines. Findings from this study can provide a foundation for discussions to help programs understand the necessary accommodations and/or support structures these non-traditional students need. Accommodations could include adaptable part-time curricular designs that include both synchronous and asynchronous learning are necessary (Cross, 2014). Support structures, for example, could include explicit opportunities for part-time students to create mentor networks (Zahl, 2015) or other support systems at the start of their degree program. Furthermore, findings show that the two part-time students in this study are engaged with the aspects of the program that are most valuable to them. These findings suggest that it may be important to consider how programs discuss the distinct professional benefits to part-time learners outside of conducting research for their main advisor. Future work will include the examination of how these and other non-traditional students cultivate persistence through their doctoral program. Results will help provide support for other "non-traditional" graduate students in the form of recommendations as they navigate their doctoral pathways.

References

Bandura, A. (1989). Human agency in social cognitive theory. *American psychologist*, *44*(9), 1175.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on psychological science*, *1*(2), 164-180.

Benekos, P. J., Merlo, A. V., & Cook, W. J. (1998). Strategies to meet the educational needs of non-traditional graduate students. *Journal of Criminal Justice Education*, *9*(2), 319-332.

Bowen, G. A. (2009). Document analysis as a qualitative research method. Qualitative Research Journal, 9(2), 27-40. doi:10.3316/QRJ0902027

Campbell, C. M., & O'Meara, K. (2014). Faculty agency: Departmental contexts that matter in faculty careers. *Research in Higher Education*, *55*(1), 49-74.

Cross, T. M. (2014). The gritty: grit and non-traditional doctoral student success. *Journal of Educators Online*, *11*(3), n3.

Davies, C., Arbeit, C. A., & Yamaner, M. (2022). Assessing the Impact of COVID-19 on Science, Engineering, and Health Graduate Enrollment: US Part-Time Enrollment Increases as Full-Time Temporary Visa Holder Enrollment Declines. InfoBrief. NSF 22-317. *National Science Foundation*.

Gardner, S. K., & Gopaul, B. (2012). The part-time doctoral student experience. *International Journal of Doctoral Studies*, *7*, 63.

Graham, C. D., & Massyn, L. (2019). Interaction equivalency theorem: Towards interaction support of non-traditional doctoral students. *International Journal of Doctoral Studies*, *14*, 187.

OECD, 2005, "The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data: Oslo Manual, Third Edition" prepared by the Working Party of National Experts on Scientific and Technology Indicators, OECD, Paris, pg. 71.

O'Leary, Z. (2014). The essential guide to doing your research project (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Rigler Jr, K. L., Anastasia, C. M., El-Amin, A., & Throne, R. (2021). Scholarly voice and academic identity: A systematic review of doctoral student agency. *Handbook of Research on Developing Students' Scholarly Dispositions in Higher Education*, 63-89.

Schilling, W. (2008, June). Issues effecting doctoral students returning to engineering education

following extensive industrial experience. In *2008 Annual Conference & Exposition* (pp. 13-816).

Strutz, M. L., Cawthorne Jr, J. E., Ferguson, D. M., Carnes, M. T., & Ohland, M. (2011). Returning students in engineering education: Making a case for "experience capital".

Sweat, K., Yedgarian, V. A., Rigler Jr, K. L., Maddox, S., & Throne, R. (2022). Doctoral practitioner researcher agency and the practice-based research agenda. In *Research Anthology on Doctoral Student Professional Development* (pp. 367-380). IGI Global.

Turner, H. (2023). Exploring motivation and satisfaction in part-time PhD students. *Studies in Graduate and Postdoctoral Education*, (ahead-of-print).

Zahl, S. B. (2015). The impact of community for part-time doctoral students: How relationships in the academic department affect student persistence. International Journal of Doctoral Studies, 10, 301-321. Retrieved from http://ijds.org/Volume10/IJDSv10p301-321Zahl0672.pdf