Sense of Program Community and Imposterism in Online Business Graduate Programs

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SENSE OF PROGRAM COMMUNITY AND IMPOSTERISM IN ONLINE BUSINESS

GRADUATE PROGRAMS

by

Heather Leigh Rippetoe

A Dissertation
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Abstract

Building off seminal works on community including McMillan and Chavis, Lave and Wenger, Graves, and Wenger et al, the Institutional, Program, and Professional (IPP) community framework for online allows students, faculty, administrators, and alumni the opportunity to consider how to support community beyond online courses into programs, the institution, and the early career (profession). At the same time, as this way of thinking about community in online learning is emerging, academia is increasingly acknowledging the presence of imposterism, also known as imposter feelings, Imposter Phenomenon, or Imposter Syndrome for students, scholars, and early professionals. Researchers are increasingly considering imposter feelings as a consequence of the gendered environment of academia where persons who do not fit the profile of the male academic are labeled as outsiders. Literature states that academic community supports student satisfaction and growth from student to scholar to professional. However, imposter feelings may be a consequence of lack of a sense of belonging and community in academia at every level of the framework. This predictive correlational study used an adapted Classroom Community Scale and Leary’s Imposterim Scale to see if sense of program community predicts imposterism. The predictor variables used in this study were gender, years of expertise in the subject, sense of community scores, university choice, and time in program (measured in semesters). The dependent or criterion variable was imposterism. The data collected was analyzed using standard multiple regression to determine the predictive power of the independent variables. The study found that imposter scores are positively associated with sense of program community. The implications of practice from this study include awareness that imposterism is a phenomenon that students are experiencing in their programs. Fully online graduate programs that are traditionally
male-dominated are encouraged to continue investigating imposterism among their
students to determine what variables affect students’ imposterism.

*Keywords: sense of community, sense of program community imposter
phenomenon, imposter syndrome, imposter feelings, imposterism, the Institutional,
Professional, and Program (IPP) Framework for Online Learning*
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List of Abbreviations

Community of Inquiry (CoI)
Higher Education (HE)
Imposter Phenomenon (IP)
Imposter Syndrome (IS)
Institutional, Program, and Professional Framework (IPP)
Institutions of Higher Education (IHEs)
Leary Imposterism Scale (LIS)
Sense of Community (SoC)
Sense of Program Community (SoPC)
Science, Technology, Engineering, and Math (STEM)
Chapter 1: Introduction

Imposterism, the sense that someone is a fraud despite evidence to the contrary, may be related to sense of belonging and community engagement in higher education (Chapman, 2015; Edwards, 2019; Handforth, 2022; Hook, 2022; Larsen, 2020; Parkman, 2016). Imposterism, also known as imposter feelings, Imposter Phenomenon (IP) or Imposter Syndrome (IS), may be caused and/or mitigated by culture and a sense of community (Mullangi & Jagsi, 2019; Tulshyan & Burey, 2021), particularly in academia (Bothello & Roulet, 2019; Breeze, 2018; Edwards, 2019; Olberding, 2018). However, to date there is very little literature on imposterism in online learning or its relationship to sense of community. Further, much of the research exploring imposterism in academia treats the phenomenon individually rather than socially (Breeze, 2018; Edwards, 2019; Handforth, 2022; Olberding, 2018). Exploring a predictive relationship between women’s sense of program community (SoPC), the community that exists beyond course work and includes interactions such as advising, research (including presenting at conferences and collaborating with faculty), and performing as a graduate, research, or teaching assistant, and imposter feelings in their online academic programs may help program faculty and administrators understand more about how to support women in traditionally male dominated online programs.

Strong sense of community in online learning environments can and should occur in individual courses, but research has also shown student benefits of supporting community beyond the formal course environment, which has led to the Institutional, Program, and Professional (IPP) community framework for online learning (Bolliger et al., 2019; Exter et al., 2009; Glazer et al., 2013; Lee & Choi, 2011; Liu et al., 2007; Milman et al., 2015; Pascarella
Shepherd and Bolliger (2019) introduced the IPP which details the presence of many layers of community in higher education, including not only courses but also the presence of institutional, program, and professional interactions that support individual development from student to scholar to professional in the field of choice. These community layers are as important as course community and need to be further explored (Bawa, 2016; Shepherd & Bolliger, 2019; Skelcher et al., 2020). Shepherd and Bolliger (2023) identified program community as the largest layer of the IPP, and define it as “feelings of trust, connection, and affiliation among students, faculty, and staff that develop and exist outside individual courses” (Shepherd & Bolliger, 2019, p. 1). This project agrees that it is beyond the course and into the larger program community where a graduate student does the most work trying on the identity of the scholar or professional as the student begins serving as a graduate or research assistant, tutoring others, or occasionally leading labs or a class. Because of the important nature of these program elements for scholarly and professional growth, this project will focus on program community in fully online graduate programs as a possible predictor of imposterism in online graduate programs.

Online learning historically has higher attrition than face-to-face learning for both men and women (Bawa, 2016; Ellis, 2019; Gaytan, 2013; Lee & Choi, 2011; Milman et al., 2015; O’Shea et al., 2015; Rovai, 2002a; Shepherd & Bolliger, 2019; Stoessel et al., 2015), even as demand for online learning continues to grow (Alexander et al., 2019; O’Shea et al., 2015; Seaman et al., 2018; Stoessel et al., 2015). Some report this attrition as high as 7 to 20 percent higher than face-to-face programs (Stephen et al., 2020). Online learning in general can be isolating (Barkley & Major, n.d.; Croft et al., 2010; Gaytan, 2013; Gillet-Swan, 2017; Glazer et
al., 2013; Glazer & Wanstreet, 2011; Irani et al., 2014; Rovai, 2001); online graduate programs can be even more so (Irani et al., 2014). Researchers exploring retention in online learning environments detail a particular connection between sense of community and program satisfaction and retention (Exter et al., 2009; Glazer et al., 2013; Liu et al., 2007; Rovai, 2002a; Rovai, 2002c), but this research has mostly focused on online courses rather than the larger community. To date there has been no research on the relationship between sense of community, particularly program community, and imposterism.

Historically, business and science, technology, engineering, and math (STEM) fields – and the academic programs that prepare them – are academic communities that are male dominated (Blackburn, 2017; Dresden et al., 2018; Francis et al., 2017, Ibeh et al., 2008; Weeden et al., 2020). Studies show women suffer feelings of isolation in male-dominated fields (González-Pérez et al., 2022; Lewis et al., 2017). Early studies in imposterism noted gender-dominated environments increase imposterism among the minority gender (Harvey & Katz, 1985). Increasingly, as online graduate programs in business and STEM are emerging as ways to meet the demands of both students and the workforce (Chirikov et al., 2020), higher education institutions (HEIs) have an interest in both recruiting and retaining women in online graduate programs in business and STEM to prepare them for these professions and in seeing them succeed once they are part of these programs. Women in these male-dominated programs may suffer from both low sense of community and imposterism. A possible relationship between these two phenomenons must be explored.
Problem of Practice Statement

Women are highly sought after as both students and employees in business and STEM fields, which are traditionally dominated by men (Blackburn, 2017; Espinosa, 2011; Flynn et al., 2020; Francis et al., 2017; Fry, 2021; Harsh, et al., 2012; Huber et al., 2022; NCSES, 2021; Palumbo, 2016; Raile et al., 2022; Weeden et al., 2020). Women in business and STEM have historically experienced a “cold cultural climate” (Harsh et al., 2012, p. 1365); gender bias (Blackburn, 2017; Palumbo, 2016; Raile et al., 2022), harassment (Barthelemy et al., 2016; Dresden et al., 2018), and encouragement to de-emphasize feminine characteristics in favor of masculine ones (Flynn et al., 2020; Francis et al., 2017). This is not academic community at its best. There is some thought that online environments can protect against such discriminatory behavior (Bawa, 2016). Wladis et al. (2015, p. 286) showed that women were present “at significantly higher rates [than men] in online STEM courses.” However, data shows that women are still graduating with fewer business and STEM degrees even though they represent most of the degree-seeking population (Palumbo, 2016; Raile et al., 2022). Research needs to continue on supporting women once they are in these environments (Blackburn, 2017; González-Pérez et al., 2022; Raile et al., 2022).

At two southeastern universities, both business and STEM programs are increasing their online graduate program offerings to help fulfill both student and workforce demand (Blackburn, 2017; Fry et al., 2021). Researchers have learned much about supporting online learners through community formation in the last decades as online learning has grown (Boston et al., 2016; Gayten, 2013; Milman et al., 2015; O’Shea et al., 2015; Shackelford & Maxwell, 2012). Online
learners are more likely to succeed in their development from student to scholar to professional when they feel like they are part of a welcoming community of learners and have a sense of community (SoC), which can reduce feelings of isolation and increase learner satisfaction and better learner outcomes (Boston et al., 2016; Exter et al., 2009; Gaytan, 2013; Gillet-Swan, 2017; Glazer et al., 2013; O’Shea et al., 2015; Shepherd & Bolliger, 2023). However, reports of imposterism are increasing in academia (Bothello & Roulet, 2019; Breeze, 2018; Edwards, 2019; Gadsby, 2022; Handforth, 2022; Vaughn et al., 2020; Watson & Betts, 2010), and at least one researcher argues the answer to imposterism is strong sense of community (Chapman, 2015). Characteristics of effective learning communities include membership, especially a sense of belonging and identification, reciprocity, fit, and regular, intentional interaction. Each of these characteristics is relevant to identity formation within communities, and it is possible that the absence of each can lead to the presence of imposter feelings. Understanding imposterism as an external rather than an internal or individual phenomenon requires a look at the relationship between the external community and the internal experience of imposterism, particularly for women in male-dominated online graduate programs who may struggle with both sense of community and with imposterism.

Women in both business and STEM may benefit from a sense of belonging in academia. Shepherd and Bolliger (2019) note that “more research is needed regarding possible gender differences associated with perceptions of program community in online settings” (p. 9). Additionally, because many women in business and STEM also experience imposter feelings as the minority gender in male-dominated spaces (Crawford, 2021; Harvey & Katz, 1985), research
should be conducted to explore possible relationships between imposter feelings and sense of program community (SoPC) for women in online, graduate business and STEM programs.

**Purpose Statement**

The purpose of this quantitative, predictive study is to explore the relationship of program and personal factors, especially sense of program community (SoPC), to imposterism scores among graduate students in online business and STEM graduate programs at two midsouth universities. Personal variables include gender, years of expertise in the subject, and SoPC score, which will be measured using an adapted Classroom Community Scale (ACCS) (Rovai, 2002b). Program variables include university and time in program. The independent variable, imposterism scores, will be measured using Leary’s 7-item Imposterism Scale (LIS) (2000). Exploring relationships among these variables in both business and STEM online graduate students may inform institutions and programs how to specifically support women in online business and STEM programs in ways that could lead to decreased attrition and increased graduation rates among this population.

**Theoretical Framework**

The Institutional, Program, and Professional Community (IPP) framework for online learning (Shepherd & Bolliger, 2023) encourages students, faculty, administrators, and alumni in online programs to consider the presence and importance of community beyond courses into programs, the institution, and on into the career (profession). Highlighting especially the importance of time in building effective community, Shepherd and Bolliger (2023) inspire a longitudinal look at online community that includes students, faculty, administrators, and alumni.
The IPP framework is grounded in a long history of community literature (Graves, 1992; Lave & Wenger, 1991; McMillan & Chavis, 1986; Wenger et al., 2002). Shepherd and Bolliger (2019, 2022, 2023) note that students and faculty may find difficulty sustaining community beyond course boundaries. An expanded sense of community (e.g., program, institution, profession) can support student success (Ellis, 2019; Milman et al., 2015; Shepherd & Bolliger, 2023). The IPP framework’s emphasis on layers of community and its finding that program community is in fact the largest of the layers inspires researchers to consider program community rather than classroom community as a factor in student development from student to scholar to professional.

**Questions**

The research questions for this study are:

**Research Question 1.** To what extent, if any, do the personal factors of gender, years of expertise in the subject, and sense of program community predict imposterism in male-dominated, online graduate programs?

**Research Question 2.** To what extent, if any, do the program factors of university choice and time in program predict imposterism in male-dominated, online graduate programs?

**Hypotheses**

The hypotheses for this study are:

**Hypothesis 1.** The personal factors of gender, years of expertise in the subject, and sense of program community scores predict sense of imposterism scores.
**Hypothesis 2.** The program factors of university choice and time in program predict imposterism scores.

**Null Hypotheses**

The null hypotheses for this study are:

**Null Hypothesis 1.** The personal factors of gender, years of expertise in the subject, and sense of program community scores do not predict imposterism scores.

**Null Hypothesis 2.** The program factors of university choice and time in program do not predict imposterism scores.

**Study Description**

The purpose of this predictive correlational study, therefore, is to determine what relationship, if any, personal and program factors have on imposterism scores in fully online, male dominated graduate degree programs at two universities in the southeastern United States. Programs of study are all masters level and include 4 business programs and 4 STEM programs. Participants were solicited through an email to their university account and in some cases via an announcement in their existing courses as well. Participants were offered a Qualtrics survey measuring sense of program community and imposter feelings as well as six demographic questions. Personal factors include gender, years of expertise in the subject, and sense of program community scores. Program factors include university and time in program. A predictive, correlational design was used to examine the relationship between personal and program factors on imposterism scores. A standard multiple regression analysis was used to examine how imposterism scores may be explained by personal and program factors. This
analysis was chosen because it allows for multiple predictor variables (Rockinson-Szapkiw, 2019; Warner, 2013).

**Definitions**

**Gender.** Gender refers to categories for individuals’ sense of their own gender (Census.gov, 2022; Perkins, 2023). Categories for this study include male, female, and other.

**Imposterism.** Initially focused on women, imposterism, also known as imposter feelings, Imposter Phenomenon, or Imposter Syndrome, refer to “an internal experience of intellectual phoniness” (Clance & Imes, 1978, p. 241) that leaves individuals thinking they do not deserve accolade for what they have accomplished and feeling like they will be exposed as an imposter at some point (Breeze, 2018; Harvey & Katz, 1985). Persons experiencing imposter feelings tend to exhibit signs of procrastination, perfectionism, and self-sabotage (Young, 2011).

**Institutional, Program, and Professional (IPP) Community Framework.** In making the case for the IPP framework, Shepherd and Bolliger (2023) introduce layers of community that students interact with over the course of their academic experiences, making distinctions between institutional, program, and professional domains across pre-admission, post-admission, and post-graduation. Their purpose with the framework is to call attention to the many elements beyond courses that contribute to student development and to call on institutions and programs to share this information with students to let them know the myriad of community involvements and resources that can support their success.

**Non-Traditional Student.** Nontraditional students are defined as being over the age of 24 and having some or all of the following characteristics: being independent for financial aid
purposes, having one or more dependents, being a single caregiver, not having a traditional high school diploma, delaying postsecondary enrollment, attending school part-time, and being employed full-time (Bawa, 2016; Bean & Metzner, 1985; Burke, 2019; Ellis, 2019; Gaytan, 2013; Gillet-Swan, 2017; Jiang & Koo, 2020; Lee & Choi, 2011; Milman et al., 2015). Rovai (2003) also notes nontraditional students often live away from campus and associate with social groups other than those connected to the college.

**Online Learning.** Learning where 80% or more of instruction occurs with online tools (Shepherd & Bolliger, 2019). Southeast University (a pseudonym) defines online learning as “a formal educational process in which instructional technology is utilized to deliver a large percentage of course components through a learning management system” (Policy 223).

**Online Course Community.** The experience of community at the course level that occurs through interactions among faculty and students working together in the same course. Bolliger et al. (2019) defines course community as “a feeling of belonging, interdependence, cohesion and trust that forms over time through student and faculty interaction” (2019, p. 3284).

**Persistence.** The student’s experience of and perspective on staying enrolled (Stephen et al., 2020; Tinto, 2012b); “the behavior of continuing action despite the presence of obstacles” (Rovai, 2003).

**Program Community.** Interactions beyond course boundaries (Bolliger et al. 2019) that support “feelings of trust, connection, and affiliation among students, faculty, and staff” (Shepherd & Bolliger, 2019).

**Sense of Community.** "A feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be
met through their commitment to be together" (McMillan and Chavis, 1986, p. 9). Social connectedness among learners and instructors who share goals. Creating and sustaining community can happen in courses, in programs, and in institutions (Shepherd & Bolliger, 2023). Rovai (2001) demonstrated that sense of community in higher education can be experienced in online learning environments.
Chapter 2: Review of the Literature

Introduction

Academia is increasingly acknowledging the presence of imposterism, also known as imposter feelings, Imposter Phenomenon (IP), or Imposter Syndrome (IS), among its students and young faculty (Breeze, 2018; Breeze et al., 2022; Chapman, 2015; Edwards, 2019; Gadsby, 2022; Handforth, 2022; Larsen, 2020; Lewis & Quinell, 2022; Parkman, 2016; Watson & Betts, 2010). Imposterism, first identified by Clance and Imes (1978) among high-performing women, includes feeling fraudulent and phony even though one is performing at an equal or better level to one’s peers (Addison & Griffin, 2022; Lewis & Quinell, 2022; Sakulku & Alexander, 2011). Persons suffering from imposterism believe that sooner than later they will be found out and revealed to be unqualified in the community to which they have been admitted (Clance & Imes, 1978; Mullangi & Jagsi, 2019; Sakulku & Alexander, 2011). They often feel phony and believe they landed in their academic communities because of luck or because someone made a concession to let them in (Clance & Imes, 1978; Grubb & Grubb, 2021; Houston, 2015; Watson & Betts, 2010).

While imposterism was initially considered to be an individual phenomenon requiring individual remedies (e.g., empowerment workshops, individual therapeutic interventions, personal mantras), researchers are increasingly considering imposterism a consequence of the gendered environment of academia where persons who do not fit the profile of the white male academic are labeled as outsiders (Breeze, 2022; Lewis & Quinell, 2022; Olberding, 2018; Stone & O’Shea, 2013; Watson & Betts, 2010). Understanding imposterism as a social
phenomenon requires looking at how social connections and the concept of community function in academia, particularly how participation in academic communities can both generate (when attempted integration is hostile) and alleviate (when attempted integration is reciprocal) imposter feelings (Bayer & Wilcox, 2019; Mulholland et al., 2023; Vaughn et al., 2020; Watson & Betts, 2010). This concept of academic community is important across academia, but, as will be seen below, it is especially salient in conversations about community in online learning where establishing academic community across distances, both physical and metaphorical, takes extra effort (Ali & Smith, 2015; Arasaratnam-Smith & Northcote, 2017; Croft et al., 2010; Lin & Gao, 2020; Rovai, 2002a; Sun & Chen, 2016; Yao et al, 2017). Online learning may also increase opportunities for varieties of students, including nontraditional women, who may be entering fields traditionally dominated by men (Wladis et al., 2015).

Participation in academic communities, both on-ground and online, supports student satisfaction and growth from student to scholar to professional (Exter et al., 2009; Glazer et al., 2013; Glazer & Wanstreet, 2011; Liu et al., 2007; Rovai 2002c; Rovai & Jordan, 2004; Shackelford & Maxwell, 2012; Shepherd & Bolliger, 2023). Academic communities at their best provide connections among faculty, staff, and students that help students move forward in their programs. Members of these communities create and share knowledge, artifacts, experiences, and learning goals (Graves, 1992; Lave & Wenger, 1991; McMillan & Chavis, 1986; Wenger et al., 2002). Ideally, when students join academic communities, they enter a “bidirectional” (McMillan & Chavis, 1986, p. 12) relationship in which they are both contributors to and recipients of the workings of the community (Graves, 1992; Lave & Wenger, 1991; McMillan & Chavis, 1986; Wenger, et al., 2002). When academic community is working well, students
receive information and opportunities to practice becoming scholars and professionals in their fields. At the same time, students contribute to academic programs by co-creating knowledge with peers and faculty, generating scholarship, and sometimes serving as teaching and laboratory assistants, particularly in graduate programs. In online learning, particular attention has been paid to building academic community within courses through asynchronous dialogue and group projects, creating opportunities for students to interact with each other and with the instructor of the course (Exter et al., 2009; Gaytan, 2013; Glazer et al., 2013; Glazer & Wanstreet, 2011; Lee & Choi, 2011; Liu et al., 2007; Milman et al., 2015; Rotar, 2017; Shepherd & Bolliger, 2019; Skelcher et al., 2020; Yang et al., 2017). However, for graduate students in particular, much of the socialization and development that occurs as the student progresses from student to scholar to professional occurs beyond course boundaries as students begin, after some time in program, applying newly acquired knowledge and skills as research assistants, teaching assistants, and interns and begin conducting research for theses or dissertations under the guidance of faculty members (Austin, 1996; Gardner & Barnes, 2007; Jazvac-Martek, 2009). In fact, Golde (2005) proposed it is departments functioning as the face of disciplines that have the most impact on graduate student success. Therefore, a more holistic picture of academic community for online learners, one that includes interactions beyond course boundaries, is warranted.

Attention to community is important in all of academia, but it is especially important for online graduate students who, because of the nature of both online learning and graduate school, could be particularly isolated from their academic community (Barkley & Major, n.d.; Croft et al., 2010; Gaytan, 2013; Gillet-Swan, 2017; Glazer et al., 2013; Glazer & Wanstreet, 2011; Irani et al., 2014; Rovai, 2001). Online learning appeals to nontraditional students who are generally
over the age of 24 and hold multiple roles such as family member, partner, employee, and student (Bawa, 2016; Burke, 2019; Ellis, 2019; Gaytan, 2013; Gillett-Swan, 2017; Jiang and Koo, 2020; Lee & Choi, 2011; Milman et al., 2015; NCSES, 2023). Online learning provides the convenience of attending to coursework and program responsibilities while allowing students to stay in their current physical location, maintain their employment and care responsibilities, and fit additional study into their daily schedules. Frequently, online programs allow working professionals who already have some years of expertise in the subject area to improve their knowledge and skills and further their careers by adding an additional certification or degree. Graduate online programs invite learners into a specialized field of expertise where their work is rewarded with a credential. As important, when academic community is working well, students emerge from these online graduate programs as professionals who have already built a network of peers in their field that includes fellow students, staff, faculty members, and other professionals (Shepherd & Bolliger, 2023). Online academic communities are one way to help diverse and non-traditional learners overcome feelings of isolation that often permeate online courses and programs (Glazer & Wanstreet, 2011; Irani et al, 2014; Liu et al., 2007; Shepherd & Bolliger, 2023).

Traditionally though, women in business and STEM have not had the best experiences of community. As noted in Chapter 1, women in business and STEM have historically experienced a “cold cultural climate” (Harsh et al., 2012, p. 1365); gender bias (Blackburn, 2017; Palumbo, 2016; Raile et al., 2022), harassment (Barthelemy et al., 2016; Dresden et al., 2018), and encouragement to de-emphasize feminine characteristics in favor of masculine ones (Flynn et al., 2020; Francis et al., 2017). Some academic programs are particularly male-dominated such as
business and STEM (Bayer & Wilcox, 2019; Fisher et al., 2019; González-Pérez et al., 2022; Raile et al., 2022). Literature has documented that achieving a positive sense of belonging or sense of community in these programs has been challenging for women (Blackburn, 2017; González-Pérez et al., 2022; Lewis et al., 2017; Rincón & George-Jackson, 2016). In fact, multiple publications refer to the chilly climate for women in STEM and the impact that climate has on women’s longevity in these communities (Blackburn, 2017; González-Pérez et al., 2022; Kim & Kim, 2023; Settles et al., 2016). Significantly, some argue the gendered nature of academia that leads to these kind of negative experiences also leads to a high experience of imposter feelings in students and faculty (Breeze, 2018; Olberding, 2018; Lewis & Quinnell, 2022). Breeze et al. (2022) argue specifically that the very nature of academia is to “exclude and marginalize some, and to center and privilege others” (p. 6). To date, however, no one has explored the relationship between sense of community and imposterism in these traditionally male-dominated programs, particularly online graduate programs that are growing in response to workforce demand (Croft et al., 2010). Because imposter feelings may reflect an individual’s sense of validation regarding community contributions and membership, it is important to examine the possible connection between experience of program community and experience of imposterism among minority participants. Additionally, because imposter feelings can be considered a social phenomenon as well as an individual one, it is important to identify where in the program students experience the chilly climate so that faculty, staff, and students can get a fuller picture of where interventions need to occur. It is possible this climate extends beyond courses into peer interactions, office hours interactions, and opportunities for teaching and research.
The Institutional, Program, and Professional Community (IPP) framework for online education (Shepherd & Bolliger, 2023) articulates the multiple layers of community present in academia that students and early professionals experience, making distinctions among these layers across pre-admission, post-admission, and post-graduation. As it illuminates student experiences beyond course boundaries, the IPP offers a more holistic view of the student community experience, which can help researchers seeking to understand where in the online program interventions need to occur to support women in male-dominated programs. While much research on community within courses has been conducted that advances course community interactions (Boston et al., 2016; Gaytan, 2013; Milman et al., 2015; O’Shea et al., 2015; Shackelford & Maxwell, 2012), a better understanding of academic community beyond course boundaries is warranted. By understanding online community through the IPP lens, researchers can begin to think beyond courses and into program activities that build welcoming academic communities, hopefully translating to warmer climates for women.

Ultimately, the IPP framework allows insight into a part of online student life that has not yet been explored in the research: program community, defined as “feelings of trust, connection, and affiliation among students, faculty, and staff that develop and exist outside individual courses” (Shepherd & Bolliger, 2019, p. 1). Since community beyond course boundaries is a large part of the online graduate student experience (Choe et al., 2017; Corrales & Komperda, 2022; Javac-Martek, 2009), this area should be explored to examine both sense of community and imposter feelings to see if, as the literature suggests, sense of program community (SoPC) predicts imposter feelings.
Imposter Feelings Among Women in Male-Dominated Professions

Imposterism has been identified at both graduate student and faculty levels of academia, two periods of time that correspond to the program and profession periods of time highlighted in the IPP. This section will explore imposter feelings as both an individual and a social phenomenon as well as the presence of imposter feelings in academia while demonstrating a possible predictive relationship between SoPC and imposter feelings for women in fully online, male-dominated graduate programs.

Origin of Imposterism

While there are issues around the definition (Gadsby, 2022), imposterism, imposter feelings, Imposter Syndrome (IS) and Imposter Phenomenon (IP) are terms that some use interchangeably. In this project, the encompassing term "imposterism” includes literature on IS, IP, and imposter feelings. All these terms describe a phenomenon, first noted by Clance & Imes in 1978, where individuals doubt their abilities, feel like they do not belong, and attribute their success to luck or external factors rather than their own skills or efforts. Persons suffering from imposterism feel that luck, rather than skill and ability, is responsible for any acceptance or success they experience (Clance & Imes, 1978; Grubb & Grubb, 2021; Houston, 2015; Watson & Betts, 2010). Leary et al. (2000) note that persons suffering from imposter feelings will go out of their way to discount affirmative responses to their work and may actively avoid praise. Early researchers of imposterism originally thought that women were affected more than men by imposter feelings; Harvey and Katz (1985) found that in gender dominated environments, individuals of the minority gender are more likely to experience imposter feelings, and in 1995,
King and Cooley found significantly higher imposter ratings for female than male college students. As to why this may be, some researchers (Clance & O’Toole, 1988; Gibson-Beverly & Schwartz, 2008) wondered if there was a social or environmental component to the appearance of women suffering from imposter feelings more than men. Perhaps men have stronger support networks than women (Clance & O’Toole, 1988). Perhaps gender role stereotypes and gender socialization play a role in feeling sense of community (Gibson-Beverly & Schwartz, 2008).

Recent literature (Breeze, 2018; Handforth, 2022; Hook, 2022; Kwak, 2023; Mullangi & Jagsi, 2019; Tulshyan & Burey, 2021) argues that imposter feelings are systemic, “public” (Breeze, 2018) and social in nature. Handforth (2022) argues imposter feelings are “connected to internalized perceptions of being somehow ‘other,’ an affective experience which makes belonging within a particular community challenging” (p. 293). The argument claims that cultural conditions lead to marginalization and imposter feelings rather than something inside the individual (i.e., a psychological experience), and that one cannot separate imposter feelings from the context in which they are felt (Breeze, 2018; Handforth, 2022; Hook, 2022; Mullangi & Jagsi, 2019; Tulshyan & Burey, 2021). According to this approach, rather than solely offering solutions of psychological workshops or therapeutic interventions for individuals, imposterism must be addressed via systemic change. This emphasis on imposterism as a social phenomenon leads to the question of how sense of community might predict imposterism.

**Imposterism in Higher Education**

The presence of imposterism in academia from the experiences of students through seasoned faculty is well documented (Bothello & Roulet, 2019; Breeze, 2018; Edwards, 2019;
Gadsby, 2022; Handforth, 2022; Vaughn et al., 2020; Watson & Betts, 2010). For many individual students, especially non-traditional (Chapman, 2015; Hook, 2022; Larsen, 2020) and minority students (Edwards, 2019; Parkman, 2016), poor sense of community may be giving rise to imposter feelings (Handforth, 2022). Student characteristics of imposterism include perfectionism, self-doubt, losing sleep, and feeling paranoia and anxiety (Chapman, 2015; Handforth, 2022; McCarthy et al., 2023). Chapman (2015) argues the anecdote for imposter feelings in students is a strong sense of community. In her exploration of imposter feelings in institutions of higher education (IHEs), Parkman (2016) found that IHEs have developed programming on IP for students at the institutional level to recognize and cope with the feelings and the resulting emotional and intellectual paralysis that can occur. Indeed, an Internet search of imposter feelings and higher education will result in pages of well-known graduate schools offering blogs and workshops aimed at helping students cope with imposter feelings. However, specifically regarding imposterism in higher education, some argue that to paint imposter feelings as an individual problem keeps communities from addressing the systemic issues that create conditions for imposter feelings to occur (Breeze, 2018; Edwards, 2019; Olberding, 2018), including the idea that IHEs are “gendered spaces” (Handforth, 2022; Raile et al., 2022). In fact, Bothello & Roulet (2019) state the very nature of business school creates conditions for imposter feelings.

**Imposterism and Women in Fully Online, Male-Dominated Graduate Programs**

One group of graduate students that may particularly suffer imposter feelings due to the nature of the environment are non-traditional women in traditionally male-dominated fields (i.e.,
have a higher share of men; Kugler et al., 2021). In general, women in higher education struggle more than men (Stoessel et al., 2015; Stone & O’Shea, 2013). Researchers have noted that women are underrepresented in business and STEM (Bayer & Wilcox, 2019; Fisher et al., 2019; González-Pérez et al., 2022; Raile et al., 2022). Currently, higher education, the United States government, and international stakeholders (Miotto et al., 2019; Reilly et al., 2016) are making moves to increase the recruitment and retention of women in both sectors (Blackburn, 2017; Miotto et al., 2019; National Science Board, 2020). Marra et al.’s multi-year, multi-institution study (2009) notes that the skills gap between men and women is shrinking, and yet women are still underrepresented in engineering. Business has a similar underrepresentation, with women making up 60% of undergraduates but only 44% of business students (Raile et al., 2022). For the U.S. to remain competitive with the rest of the world, the IHEs and the business sector must come together to address these disproportions (National Science Board, 2020). This is important, because with business and STEM higher education degrees, women gain access to more lucrative careers and therefore also represent more equally in leadership (like board rooms), academia, and entrepreneurial spaces (Ibeh et al., 2008; Krishen et al., 2020; Krishna & Orhun, 2022; Kugler et al., 2021; Miotto et al., 2019; Raile et al., 2022).

Research exists on encouraging women to enter business (Ibeh et al., 2008; Raile et al., 2022) and STEM fields (Blackburn, 2017; Fisher et al., 2019; González-Pérez et al., 2022; NCES, 2021; Weeden et al., 2020), but some (Blackburn, 2017; González-Pérez et al., 2022; Raile et al., 2022) argue that not as much attention has been paid to issues related to the overall longevity of those women once they have arrived in these settings. Crawford (2021) argues that male-dominated professions view women as not a good fit for jobs perceived to be masculine
and argues such a gendered context can both initiate and exacerbate imposter feelings in women. Because having a support network or a stronger sense of community makes women feel less alone (González-Pérez et al., 2022; Lewis et al., 2017) and contributes to women’s success in STEM (Blackburn, 2017; Rincón & George-Jackson 2016), it is likely that sense of community predicts imposter feelings for women in male-dominated environments.

Identity, Learning Communities, and Online Learning in Higher Education

Individual students’ sense of community (SoC) has been identified as an important predictor for student satisfaction in higher education. As higher education researchers in the second half of the 20th century explored what kept students on the path to success in face-to-face environments, they identified SoC and sense of belonging as essential (Spady, 1970; Pascarella, 1980; Tinto, 1993). Importantly, these researchers found both in-course and beyond-course engagement essential to higher SoC for students. Additionally, in face-to-face environments, researchers have explored the importance of identity development for graduate students seeking to join academic and professional communities (Choe et al., 2017; Corrales & Komperda, 2022; Jazvac-Martek, 2009). Finally, learning theorists have proposed that the kind of learning that changes students from individual learners into members of learning communities occurs in social environments such as communities of learners (Graves, 1992) or communities of practice (Lave & Wenger, 1991; Wenger et al., 2002), even when individuals in those communities function at a distance from one another. In fact, Lave and Wenger (1991) state, “One way to think of learning is as the historical production, transformation, and change of persons” (Lave & Wenger, 1991, p. 51). This section details SoC definitions that explain the connection between individual growth
and the kind of positive community membership that have led to the IPP framework for online learning.

**Identity and Community in Higher Education**

Graduate student identity development is growing as a means of studying graduate student retention (Choe et al., 2017), and that development occurs in communities (Corrales & Komperda, 2022; Jazvac-Martek, 2009). In fact, regarding the connection between identity and learning, Hand and Gresalfi (2015) “propose a fairly simple definition of identity as *one’s participation in and across activities and the sense one makes of oneself in relation to these activities*” (p. 191, emphasis in original). The literature largely indicates that student identity is not stagnant; that is, one does not want to simply remain a student, but rather wants to grow into a professional in the field (Choe et al., 2017; Corrales & Komperda, 2022; Javac-Martek, 2009). This trajectory aligns with the kind of learning described in effective communities of learning (Graves, 1992) and communities of practice (Lave & Wenger, 1991; Wenger, 2002) where individuals enter as newcomers and leave as old timers (Lave & Wenger, 1991). While specifics of identity and community (e.g., roles, artifacts) will differ across disciplines, a central understanding of graduate student identity is understood as being the “kind of person” that belongs in a program (Choe et al., 2017; Corrales & Komperda, 2022; Javac-Martek, 2009). It is important to the development of the Institutional, Program, and Professional (IPP) framework to understand learning as a social construct that requires an individual to be part of the kind of layered and sustained community that cannot be experienced in courses alone.
Establishing a learning community to support growth from student to scholar to professional has a long history. In their seminal work on SoC, McMillan and Chavis (1986, p. 9) defined SoC as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together.” This definition encompasses four areas of community: membership, influence, integration and fulfillment of needs, and shared emotional connection (McMillan & Chavis, 1986). In their detailed discussion of each of these four areas, McMillan and Chavis (1986) further develop characteristics of successful community that researchers find essential to successful learning communities both on ground and online. As other researchers turned toward community and learning, they identified characteristics of successful learning communities that echo McMillan and Chavis (Graves, 1992; Lave & Wenger, 1991; Wenger et al., 2002).

Characteristics of effective learning communities include membership, especially a sense of belonging and identification, reciprocity, fit, and regular, intentional interaction. Each of these characteristics is relevant to identity formation within communities, and it is possible that the absence of each can lead to the presence of imposter feelings.

First, in their discussion of membership, McMillan and Chavis (1986) highlight the importance of a sense of belonging and identification (McMillan & Chavis, 1986). The individual's sense that they belong in this group – or the fear that they do not – has an enormous impact on that person’s comfort and participation in the group (Lave & Wenger, 1991; Graves, 1992). If one feels that one is not truly a member of a community, the feeling of being an imposter will be exacerbated. Second, when discussing influence, McMillan and Chavis (1986) introduce the importance of respect for individual differences which is critical where perceived
newcomers may have individual contributions unique to communities historically perceived to be closed, such as male-dominated programs or professions. These differences are naturally occurring in groups that are brought together from different cultures and geographies to work on common knowledge goals (Wenger et al., 2002), and they keep the community from becoming stagnant or homogenous (Graves, 1991). Additionally, McMillan and Chavis (1986) note that the concept of influence is “bidirectional” (p. 12), and in effective communities, both the community and the individual will benefit from engagement with one another; Lave and Wenger (1991) describe this process as “shared participation” (p. 116), and Graves calls this characteristic “integrative” (1992, p. 65, borrowing from M. Scott Peck). This element of reciprocity might be considered almost radical in a transactional model of education but fits perfectly in not only a constructivist educational environment where learners co-create/co-construct knowledge but also in a world where individuals previously considered different or other are influencing/joining communities previously dominated by white men and may want to identify with and influence those communities. If newer community members are not allowed to contribute to the identity of the community, those members may be likely to understand themselves as imposters in that community. Third, and similar to the above, in their discussion of integration and fulfillment of needs, McMillan and Chavis (1986) note that strong communities find places for everyone in the community, which they refer to as “fit” (p. 13). This willingness and ability is important because it shows commitment from existing members to actively make space for new members of the community. If new members receive the message that they are not a good fit, they will likely experience imposter feelings. Finally, summarizing shared emotional connection, McMillan and Chavis (1986) explain the importance of interactions and events that indicate that simple
awareness of community isn’t enough; there should also be tangible, actionable opportunities of acknowledgment and attention to that community through action. This regular, intentional interaction (Graves, 1992; Wenger et al., 2002) is essential to community development and maintenance and is visualized in the IPP framework. Inclusion or exclusion will likely mitigate or exacerbate imposter feelings. An important additional point here is that these interactions can take time, and over time, the interactions may deepen and seem more natural (Beeson et al., 2019).

The development of effective learning communities that at their best offer membership, especially a sense of belonging and identification, reciprocity, fit, and regular, intentional interaction that can lead to the production of artifacts takes time and efforts of a variety of people in the community. It is the holistic nature of individual development within a more layered online community that leads to the development of the IPP framework for online learning. Before looking specifically at the IPP, however, it is important to understand the growth of online learning and the importance sense of community has gained in this space.

**Definitions, Design, and Popularity of Online Learning**

Early in their piece, McMillan and Chavis (1986) provided a notion of community beyond physical location. This idea quickly becomes important to higher education as technology advances and people can create professional and personal communities across the previous boundaries of geography and time (Croft et al., 2010). For example, in 2002, Wenger et al. described groups of workers in organizations that crossed geography and time as “distributed communities” (Ch. 6, Key Issues in Distributed Communities, para. 1). Wenger et al. (2002)
expand the definition of “distributed” beyond time and geography to include four factors: distance, size, organizational affiliation, and cultural differences. Wenger et al. (2002) believe that the effort put forth for these communities to stay connected and focused on their goals provides greater rewards (Wenger et al., 2002). For IHEs with fully online programs working to support individuals’ development from student to researcher/scholar to professional, communities that can come together to work on shared goals regardless of cultural or geographical separation are essential.

For IHEs, distance learning is learning where teacher and students are separated spatially and by time (Bolliger & Halupa, 2018; Liu, et al., 2007; Moore, 1989; Rovai, 2002a). Most definitions of online instruction cite that 80% or more of the instruction is delivered online (Allen & Seaman, 2014; Smith & Brame, 2014), usually through a web-based learning management system. Southeast University’s definition, in its official Distance and Online education policy, does not provide a specific percentage but instead specifies “online education is a formal educational process in which instructional technology is utilized to deliver a large percentage of course components through a learning management system” (Southeast University, Policy 223). This definition of online learning can be considered course-centric in that its very wording focuses on formal learning time. However, institutions of higher education (IHEs) in general, Southeast University (a pseudonym) and University of the Midsouth (a pseudonym) included, are not just offering online courses; the success of online courses has led to the design and delivery of entire online programs. Both universities are among many IHEs that offer fully online graduate programs to meet both student and workforce demands (Croft et al., 2010). This presence of entire online programs is important because researchers argue the sense of
community created in online courses may not carry over into the overall program experience once a course ends (Bolliger et al., 2019; Exter, 2009; Liu et al., 2007; Shepherd & Bolliger, 2019, 2022, 2023). Further, the identity development that is a significant part of the graduate student experience often occurs as much outside of courses as within (Choe et al., 2017; Corrales & Komperda, 2022; Jazvac-Martek, 2009).

Increase in online learning is a global trend (O’Shea et al., 2015; Roddy et al., 2017; Stoessel et al., 2015). Universities are increasing their online options as ways of staying vital, relevant, and competitive when meeting student needs (Gillett-Swan, 2017; Milman et al., 2015; Rovai 2002a). In fall 2020, well into the pandemic, 7 million undergraduate students were exclusively taking distance education courses (NCSES, 2023), up from 3 million in 2016 (Seaman et al., 2018). This number is 186 percent higher in 2020 than in 2019 (7.0 million vs. 2.4 million) (NCSES, 2023). It is important to note this increase is not just because face-to-face opportunities decreased because of the pandemic. Online learning provides an open, flexible, and accessible (Cercone, 2008; Stoessel et al., 2015) learning environment for students who may not otherwise be able to pursue higher education, because it allows students to schedule courses around their own life demands and allows them to pursue subjects that might not have been available locally (Bawa, 2016; Burke, 2019; Ellis, 2019; Gaytan, 2013; Gillett-Swan, 2017; NCSES 2023; O’Shea et al., 2015; Roddy, 2017; Rotar, 2017).

Because of this flexibility and accessibility, online learning is particularly attractive to non-traditional students, defined as being over the age of 24 or having some or all of the following characteristics: being independent for financial aid purposes, having one or more dependents, being a single caregiver, not having a traditional high school diploma, delaying
postsecondary enrollment, attending school part-time, and being employed full-time (Bawa, 2016; Burke, 2019; Ellis, 2019; Gaytan, 2013; Gillett-Swan, 2017; Jiang and Koo, 2020; Lee & Choi, 2011; Milman et al., 2015; NCSES, 2023). Wladis et al. (2015) conclude that online courses may be an entry point for women. The multiple roles outside of the educational environment that non-traditional students have can cause complications around scheduling and resource prioritization and allocation, particularly for nontraditional women (Burke, 2019; Markle, 2015; Stephen, et al., 2020). These women may also be caring for children or aging family members while at the same time looking to add a homework schedule around part- or full-time employment (Rockinson-Szapkiw et al., 2017).

Online learning programs provide opportunities for continued personal and professional growth on a schedule that works with students rather than forcing students to conform to geographical and time constraints of brick-and-mortar programs. This flexibility and availability means that women and others who have traditionally had constraints that kept them from being able to participate in on-ground learning are now free to pursue educational opportunities that once eluded them.

**Attrition, Isolation, and Community in Online Learning**

The flexibility and availability of online learning makes it a popular option for students for whom traditional education proposes barriers. However, not all students successfully complete online programs. Attrition has been an issue since the turn of the century (Carr, 2000; Rovai, 2002c). Online attrition is higher than in on-ground learning environments (Bawa, 2016; Ellis, 2019; Gaytan, 2013; Lee and Choi, 2011; Milman et al., 2015; O’Shea et al., 2015; Rovai,
2002a; Stoessel et al., 2015), ranging from 7 to 20 percent higher for online courses and programs in the United States (Stephen et al., 2020). Researchers believe one contributing factor is the isolation experienced by members of communities that do not share geographical space (Ali & Smith, 2015; Glazer et al., 2013; Irani et al., 2014; Rovai & Jordan, 2004). However, isolation in online learning can mean much more than just physical distance. For example, Croft et al. (2010) found isolation for online learners can take many forms, including “time (concurrent study); space (geographic dispersal); social (awareness of others), intellectual/experience (academic ability and life experiences); profession (subject related expertise); ICT knowledge; sensory (ability to see/feel/hear peers); cultural; and subject (if anyone else is studying the same topic)” (Croft et al., 2010, p. 33). These multiple forms of isolation illuminate the many kinds of connection important to learners and illustrate the many ways course and program designers need to attend to student needs. According to this range, isolation can take many different forms. Understanding these different forms is important for researchers to understand more about what actual online students are feeling when they are experiencing isolation so appropriate solutions can be sought. It also makes sense that this range of isolating factors cannot all be addressed in a single course or individual courses alone. Rather, it is participation in a program over time that allows such range to be addressed.

Over the years, practitioners have combined design and technology to address the types of isolation Croft et al. (2010) describe in online courses. Discussions, group projects, and peer review assignments provide student-to-student engagement, and sharing content and providing feedback on assignments provides teacher-to-student engagement, both of which can support feelings of community where members are joined together for common goals. However,
Shepherd & Bolliger (2019, 2022, 2023) propose that after a course ends, that community dissipates, or at the very least, struggles to sustain itself beyond that course’s end. Online community likely extends beyond the course community, but research must be conducted to see to what extent it exists in programs. Additionally, understanding how that community predicts imposterism among minority students is important for understanding student experiences and designing for improvements.

The Institutional, Program, and Professional (IPP) Framework for Online Learning

Building off seminal works on community including McMillan and Chavis (1986), Lave and Wenger, 1991, Graves (1992), and Wenger et al. (2002), the IPP framework for online learning allows students, faculty, administrators, and alumni the opportunity to consider how effective learning community occurs in online environments in higher education. The emphasis is on a holistic view of community that begins before opening the first online course and extends over time beyond the completion of course work and into program activities that support the development from student to scholar to professional.

While course community is essential and possible in online learning (Rovai, 2002a), the IPP framework builds on literature noting SoC also can and should occur at the institutional, program, and professional levels to support student identity development. Researchers have found that the sense of community that does – or does not – develop beyond individual courses and in the larger program and institution is essential to student success (Rovai, 2002a; Shepherd et al., 2023; Skelcher et al., 2020, Tinto, 2017; Yang et al., 2017). Rovai in 2002a noted that while some of the factors related to success are outside of the influence of the institution, some
can be influenced by the institution. Students are aware of this and understand the importance of the larger learning community to their development. In a 2019 study on graduate student perceptions of program community, Shepherd and Bolliger found that 90.5% of online graduate students felt pride in being part of their academic programs and 66% understood graduate program membership to be part of their identity. This finding demonstrates that program pride and not just individual course membership is of interest to online graduate students and necessitates attention. In fact, building an academic identity is a significant part of the graduate school experience (Choe et al., 2017; Corrales & Komperda, 2022; Handforth, 2022; Jazvac-Martek, 2009).

In making the case for the IPP framework, Shepherd and Bolliger (2023) introduce layers of community and argue that students interact with these layers over the course of their academic experiences, making distinctions between institutional, program, and professional domains across pre-admission, post-admission, and post-graduation. Their purpose with the framework is to call attention to the many elements beyond courses that contribute to student development and to call on institutions and programs to share this information with students to let them know the myriad of community involvements and resources that can support their success.

The IPP framework highlights individual student development from student to scholar to professional and demonstrates that time in program makes up the majority of the student’s experience. Many community studies focus on the role of faculty members and what they can do to support community in the classroom. The IPP framework allows researchers to consider the role of the individual student across several kinds of community encountered in academia: early student experiences that include connections with institutional resources like admissions and
financial aid, program experiences that can include coursework but significantly also includes engagement beyond courses, and the experiences of moving from scholar to early professional as the student begins leaving academia and exploring professional roles.

In this diagram, course community is not reflected, as Shepherd and Bolliger (2023) include courses as part of the program. One can clearly see the dominance of the role of programs in the graduate student experience. It is in programs—not courses—that graduate students experience the "instances” that move them from student to scholar to professional as these examples from Jazvac-Martek's (2009) qualitative study indicate:

Figure 1

*Representation of Institutional, Program, and Professional Community Layers Over Time. Used with permission from Springer Nature.*
Diverse and varied examples of these instances include having peer-like discussions with other faculty, speaking to others from a position of expertise, collaborating on ideas, engaging in scholarly discussions, deeply thinking or attending to ideas, receiving constructive or even negative feedback on written papers or proposals, working on publications, having publications accepted, presenting at conferences, receiving subject-specific grants from disciplinary communities, being invited to give a talk, or an interview for a tenure-track faculty position. (p. 258)

These instances occur while the student is still in the program, and may increase in frequency with time in program, but they frequently occur beyond course boundaries. The IPP framework accounts for these program and professional formative experiences in ways that course community studies do not. By highlighting the importance of program community to the overall development of individuals from student to scholar to professional, the IPP invites attention to an enormous part of the individual’s online learning experience. For the purposes of this project, then, program community will be the focus to predict how sense of program community (SoPC) predicts imposterism scores.

**Summary/ Solution**

Women in male-dominated programs experience imposter feelings, which may be predicated on their experience of community in their academic programs. Imposter feelings, when understood as a social rather than an individual phenomenon, may be caused by the chilly climate itself, which may be an indicator of community functioning at less than optimum levels. Effective learning communities offer membership, especially a sense of belonging and
identification, reciprocity, fit, and regular, intentional interaction. Previous studies have looked at SoC in the online course environment, but literature shows a gap in understanding the role and presence of SoC beyond the course level, especially in programs that are offered entirely online. The IPP framework illustrates the different areas in higher education where the institution, program, and profession interact with the individual student seeking to progress to scholar then professional. Engagement in community beyond the course level is essential to providing students with opportunities to grow from student to scholar to professional. The solution to the question of if and to what extent program community predicts imposterism for women in male-dominated programs is to conduct a predictive correlational study measuring sense of program community scores to see if they predict imposterism in this population.
Chapter Three: Methodology

Introduction

Women are often enrolling in fully online graduate programs in business and STEM as IHEs are increasing these program offerings. Attrition is an issue in online programs (Bawa, 2016; Ellis, 2019; Gaytan, 2013; Lee and Choi, 2011; Milman et al., 2015; O’Shea et al., 2015; Rovai, 2002a; Stoessel et al., 2015), and women are underrepresented in business and STEM (Blackburn, 2017; Espinosa, 2011; Fisher et al., 2019; Flynn et al., 2020; Francis et al., 2017; Fry, 2021; Harsh, et al., 2012; Huber et al., 2022; NCSES, 2021; Palumbo, 2016; Weeden et al., 2020). Sense of community supports student development from student to scholar to professional, particularly among this population (Blackburn, 2017; Fisher et al., 2019). Program community, in particular, offers the kinds of activities and community that helps students develop their identities from student to scholar to professional (Jazvac-Martek, 2009). There is a need to understand if and to what extent sense of program community (SoPC) predicts imposterism for women in fully online, male-dominated graduate programs in business and STEM.

The purpose of this predictive correlational study, therefore, was to determine what relationship, if any, personal and program factors, including SoPC scores, have with imposterism scores for students in fully online, male-dominated graduate degree programs. Personal factors include gender, years of expertise in the subject, and SoPC scores. Program factors include university and time in program. Data was collected via a Qualtrics survey created for this study.
The results were analyzed for prediction. This chapter describes the investigation plan, including the method and design, participants, setting, and procedures used in this study.

**The Investigation Plan**

A predictive, correlational design was used to examine the relationship between personal and program factors and imposterism scores. Correlational design allows the researcher to hypothesize or examine relationships between or among variables (Creswell & Creswell, 2018; Gay & Airasian, 2000; Urdan, 2018). Prediction research can help solve problems of practice by illuminating relationships, which can lead to more specific research designs (Gall et al., 2015; Gay & Airasian, 2000).

A standard multiple regression analysis was used to examine how imposterism can be predicted by personal and program factors, including SoPC scores. This analysis was chosen because it allows for multiple predictor variables (Rockinson-Szapkiw, 2019; Warner, 2013). A survey was used to gather data on personal and program factors.

![Figure 2](image)

*Model*
Participants/ Learner Characteristics

The population of this study included students enrolled in male-dominated, online graduate programs at two southeastern, 4-year, universities. Students were enrolled in one of the male-dominated, online graduate programs the universities offer in either business or STEM.

Table 1
Male-Dominated, Fully Online Graduate Programs, Southeast University

<table>
<thead>
<tr>
<th>Program</th>
<th>Degree Offered</th>
</tr>
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<tbody>
<tr>
<td>Accountancy</td>
<td>MAcc</td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA</td>
</tr>
<tr>
<td>Engineering Management</td>
<td>MSEM</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>MS</td>
</tr>
<tr>
<td>Professional Science in</td>
<td>PSM-EI</td>
</tr>
<tr>
<td>Environmental Informatics</td>
<td></td>
</tr>
</tbody>
</table>

Table 2
Male-Dominated, Fully Online Graduate Programs, University of the Midsouth

<table>
<thead>
<tr>
<th>Program</th>
<th>Degree Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountancy</td>
<td>MS</td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA</td>
</tr>
<tr>
<td>Engineering Management</td>
<td>MS</td>
</tr>
<tr>
<td>Engineering Technology</td>
<td>MS</td>
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</tbody>
</table>

As the researcher used participants that are convenient based upon the responsiveness of the enrolled online learners, student participants were a non-randomized, convenience sample. The participants were almost evenly divided between male \((n = 30, 50.85\%)\) and female \((n = 29, 49.15\%)\). The majority were Caucasian \((n = 44, 74.6\%)\) and of non-traditional age, over 25 years-old \((n = 43, 72.9\%)\). Participants represented two universities. Southeast University had
more participants ($n = 32, 54.2\%$), and included students from the Master of Business Administration (MBA; $n = 26, 81.5\%$ of all responders from that university) and Master of Accounting (MAcc; $n = 6, 18.8\%$ of responders) programs. University of the Midsouth represented 27 participants ($n = 27, 45.8\%$) and included students from MBA ($n = 22, 81.5\%$ of all responders from that university), Master of Science in Accounting ($n = 4, 14.8\%$), and Master of Science in Engineering ($n = 1, 3.7\%$) programs. Twenty-nine participants had 2-5 years of prior expertise in the subject. Additionally, 13 students completed 1 semester (21.7\%) and 12 had completed three semesters (20\%). First generation students were in the minority of responders ($n = 18, 30.5\%$).

The students in this study completed an online survey via Qualtrics which included a set of demographic, sense of program community, and imposterism questions. The survey is in Appendix B. Participants were fully informed about the survey via the accompanying email and given an online option to respond (Dillman et al., 2014). For Southeast University, the researcher received student and professor emails and a list of relevant online courses from the Center for Innovation in Teaching and Learning. Participants and instructors received information about the research either via email from the researcher or through a post by instructors in their online courses. For University of the Midsouth, a university professor received emails of relevant students from program coordinators and then sent emails directly to students. The information included an introduction to the survey and an incentive for participating: a drawing for a $25 Amazon card. The email also included information about the research, an informed consent form, and a link to the survey in Qualtrics. Follow-up emails were sent to increase participation at both universities thanking students who had already participated in the survey and including
the same information about the survey and a link to the Qualtrics survey. After the survey closed, ten $25.00 gift cards were given away in a random drawing to those participants who entered the random drawing by completing the Google form at the end of the Qualtrics survey.

A GPower analysis found that for an effect size of .15, a minimum sample of 138 would be needed to ensure an adequate sample size for the simple correlational design as well as adequate sample size for the statistical analysis (Creswell & Creswell, 2018). The power analysis is in Appendix C. However, Tabachnick & Fidell (2013) include a formula for calculating effective sample size for five predictors that puts the idea number at at least 90 (N > 50+ 8m). Additionally, Harris’s 1985 suggestion that the number of participants should exceed the number of predictors by at least 50, so long as five or fewer predictor variables are used (Van Voorhis & Morgan, 2007). Ultimately, Harris’s guidance was chosen based on participation.

**Setting**

The settings are two public universities referred to as “Southeast University” and “University of the Midsouth.” The researcher is employed as an instructional designer at Southeast University. Founded in 1915 as a polytechnical institute on the grounds where a religious college had stood since 1909, Southeast University currently serves over 7800 undergraduates and 1200 graduates (OIARE, n.d.) in a small, southeastern city. The overwhelming majority of students are white and hold in-state residency. The university is organized into eight academic schools and colleges, offering over 200 academic programs ranging from liberal arts, agriculture, business, education, engineering, and nursing. Many faculty receive national and international level research grants. The graduate school offers more than 60 graduate degree programs and concentrations at both the master and doctoral level. In
2021-2022, the graduate school awarded over 400 degrees (OIARE, n.d.). The graduate school offers 11 online programs (Online graduate programs, 2023), 5 of which are traditionally male-dominated (Blackburn, 2017; Dresden et al., 2018; Francis et al., 2017) and, in fact, that stereotype bears out at STEM University where men outnumber women in these programs 170 to 95 (OIARE, n.d.).

Table 3

<table>
<thead>
<tr>
<th>Program</th>
<th>Degree</th>
<th>Males</th>
<th>Females</th>
<th>Total Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>MAcc</td>
<td>9</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA</td>
<td>118</td>
<td>64</td>
<td>182</td>
</tr>
<tr>
<td>Engineering Management</td>
<td>MSEM</td>
<td>12</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>MS</td>
<td>22</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>Professional Science in Environmental Informatics</td>
<td>PSM-EI</td>
<td>9</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>170</td>
<td>95</td>
<td>265</td>
</tr>
</tbody>
</table>

University of the Midsouth (UM) was founded in 1912 and is located in a major city in the southeastern United States. UM serves almost 22,000 students in ten colleges with over 250 areas of study. The graduate school offers master’s degrees in 54 subjects and doctoral degrees in 26 disciplines. In 2021-2022, the graduate school awarded over 1300 master’s and doctoral degrees. The graduate school offers 46 online programs, 5 of which are traditionally male dominated (Blackburn, 2017; Dresden et al., 2018; Francis et al., 2017). At University of the Midsouth, women and other actually outnumber men by 200 to 186 in these programs.
Table 4

Numbers of Males and Females Enrolled in University of the Midsouth's Male-Dominated Online Graduate Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Degree</th>
<th>Males</th>
<th>Females &amp; Other</th>
<th>Total Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>MS</td>
<td>16</td>
<td>26</td>
<td>42</td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA</td>
<td>161</td>
<td>174</td>
<td>335</td>
</tr>
<tr>
<td>Engineering Management</td>
<td>MS</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Engineering Technology</td>
<td>MS</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>186</td>
<td>200</td>
<td>386</td>
</tr>
</tbody>
</table>

**Instrumentation/ Data Collection Methods**

For the purposes of this study, program community is defined as “the feeling of belonging, affiliation, purpose, and interdependence that exists among instructors, support staff, students, [and] alumni” that can occur at the program level as students progress toward their learning goals (Shepherd & Bolliger, 2022, p. 2), and imposterism is defined as “an internal experience of intellectual phoniness” (Clance & Imes, 1978, p. 241). The survey, Sense of Program Community and Imposterism in Online Graduate Students, was created based on adaptations of Rovai’s Classroom Community Scale (ACCS) (2002b) and the Leary Imposterism Scale (LIS) (Leary et al., 2000). The survey used in this study can be viewed in Appendix B. The survey has an introduction and three sections. The first section collected demographic data: gender, age category, ethnicity, years of expertise in the subject, university, program, and time in program, and whether or not the respondent is a first-generation college student. The second section measured sense of program community with an adapted version of the Classroom Community Scale.
Community Scale (Rovai, 2002b) a 20-item scale with two subscales, community and learning. “Cronbach’s coefficient $a$ for the full Classroom Community Scale was .93 and the equal-length split-half coefficient was .91, indicating excellent reliability” (Rovai, 2002b, p.206). For this study, the word “course” is replaced by “program,” and the phrase “in this program” is added for clarity, and the scale is referred to as the Adapted Classroom Community Scale (ACCS). The changes are displayed in Table 5. It is notable that several ACCS survey questions are worded negatively and were therefore reverse coded when preparing the data for analysis. The third section measured Imposterism via the Leary Imposterism Scale (LIS) (Leary et al., 2000), a 7-item instrument with high interitem reliability (Cronbach’s $\alpha= .87$) (Leary et al., 2000). McElwee and Yurak (2007) report the internal consistency is very good to excellent ($\alpha=0.91$) There is no gold standard for measuring imposter phenomenon (Leary et al., 2000; Mak et al., 2019). A final page allowed respondents to click a link to a Google form to enter a drawing for one of 10 $25 Amazon gift cards.

Table 5

Original Rovai Questions Compared to Current ACCS Survey Questions

<table>
<thead>
<tr>
<th>Original Rovai Survey Question</th>
<th>Current ACCS Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel that students in this course care about each other.</td>
<td>1. I feel that students in this program care about each other.</td>
</tr>
<tr>
<td>2. I feel that I am encouraged to ask questions.</td>
<td>2. I feel that I am encouraged to ask questions in my program.</td>
</tr>
<tr>
<td>3. I feel connected to others in this course.</td>
<td>3. I feel connected to others in this program.</td>
</tr>
<tr>
<td>4. I feel that it is hard to get help when I have a question.</td>
<td>4. I feel that it is hard to get help when I have a question in this program.</td>
</tr>
<tr>
<td>5. I do not feel a spirit of community.</td>
<td>5. I do not feel a spirit of community in this program.</td>
</tr>
</tbody>
</table>
Table 6, (Continued)

<table>
<thead>
<tr>
<th>Original Rovai Survey Question</th>
<th>Current ACCS Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. I feel that I receive timely feedback.</td>
<td>6. I feel that I receive timely feedback in this program.</td>
</tr>
<tr>
<td>7. I feel that this course is like a family.</td>
<td>7. I feel that this program is like a family.</td>
</tr>
<tr>
<td>8. I feel uneasy exposing gaps in my understanding.</td>
<td>8. I feel uneasy exposing gaps in my understanding in this program.</td>
</tr>
<tr>
<td>9. I feel isolated in this course.</td>
<td>9. I feel isolated in this program.</td>
</tr>
<tr>
<td>10. I feel reluctant to speak openly.</td>
<td>10. I feel reluctant to speak openly in this program.</td>
</tr>
<tr>
<td>11. I trust others in this course.</td>
<td>11. I trust others in this program.</td>
</tr>
<tr>
<td>12. I feel that this course results in only modest learning.</td>
<td>12. I feel that this program results in only modest learning.</td>
</tr>
<tr>
<td>13. I feel that I can rely on others in this course.</td>
<td>13. I feel that I can rely on others in this program.</td>
</tr>
<tr>
<td>14. I feel that other students do not help me learn.</td>
<td>14. I feel that other students do not help me learn in this program.</td>
</tr>
<tr>
<td>15. I feel that members of this course depend on me.</td>
<td>15. I feel that members of this program depend on me.</td>
</tr>
<tr>
<td>16. I feel that I am given ample opportunities to learn.</td>
<td>16. I feel that I am given ample opportunities to learn in this program.</td>
</tr>
<tr>
<td>17. I feel uncertain about others in this course.</td>
<td>17. I feel uncertain about others in this program.</td>
</tr>
<tr>
<td>18. I feel that my educational needs are not being met.</td>
<td>18. I feel that my educational needs are not being met in this program.</td>
</tr>
<tr>
<td>19. I feel confident that others will support me.</td>
<td>19. I feel confident that others will support me in this program.</td>
</tr>
<tr>
<td>20. I feel that this course does not promote a desire to learn.</td>
<td>20. I feel that this program does not promote a desire to learn.</td>
</tr>
</tbody>
</table>

In total, the survey contained 35 questions with 27 using a five-point Likert scale for responses (Gall et al., 2015).
Data Collection/ Procedures

Participants were fully informed about the survey and given an online option to respond confidentially (Dillman et al., 2014). First, with the assistance of the Center for Innovation in Teaching and Learning (CITL) at the university, the researcher received a list of emails of students currently enrolled in courses required for online graduate programs from the university’s Center for Innovation in Teaching and Learning. The researcher then contacted the students via email (both introductory and follow-up emails as needed). The emails included information about the research and a link to the survey in Qualtrics. The follow-up emails thanked students who had already participated in the survey and included the same information about the survey and a link to the anonymous Qualtrics survey. The researcher also emailed instructors of the relevant graduate online courses to post the survey information into the announcement area of their online courses as an additional invitation to the online graduate students. Consent was obtained in the Qualtrics survey; when participants began the survey, they read a welcome note that indicated that when they submit their responses at the end of the questionnaire, they explicitly express their informed consent to participate in the study.

Procedures

The researcher sought and received IRB approval from both universities involved in the study (see Appendix A). The survey was administered as described above over a 6-week time frame using the online survey system Qualtrics and then closed. After the survey was closed, the data was downloaded and exported into Statistical Package for Social Sciences (SPSS) version
29.0.1.0 and analysis was conducted. This analysis included reverse-coding items in the ACCS to account for negatively worded questions. Also, after the survey closed, the ten $25.00 Amazon gift cards were given away in a random drawing to those participants who entered the random drawing by completing the Google Form at the end of the Qualtrics survey. The drawing occurred two weeks after the survey closed, and winners were notified by the email they provided and the gift cards were mailed via Amazon to the email address provided in the Google Form.

Analysis

The purpose of this predictive correlational study was to predict the relationship between personal and program factors and imposterism scores for online graduate students at two universities in the southeastern United States. The independent variables were gender, years of expertise in the subject, SoPC score, university, and time in program. The dependent variable, imposterism scores, was generally defined as “an internal experience of intellectual phoniness” (Clance & Imes, 1978, p. 241) that leaves individuals thinking they do not deserve accolade for what they have accomplished and feeling like they will be exposed as an imposter at some point (Breeze, 2018; Harvey & Katz, 1985). Descriptive statistics are reported in Chapter 4 as means, standard deviations, and/or frequencies and percentages (Urdan, 2017; Warner, 2021). A correlation matrix was used to identify associations between descriptive variables and criterion variables. All statistics are reported in Chapter 4.

Table 6 demonstrates the alignment for each research question and the analyses conducted. All of the analyses for the study was completed using SPSS version 29.0.1.0.
Table 6

Research Questions and Analysis Alignment

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Source</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1. To what extent, if any, do the personal factors of gender, years of expertise in the subject, and sense of program community predict imposterism in male-dominated, online graduate programs?</td>
<td>Survey Questions gathering demographic information</td>
<td>Standard multiple regression</td>
</tr>
<tr>
<td></td>
<td>Survey questions from the adapted Rovai Classroom Community Scale (ACCS) (20 questions)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Survey Questions from the Leary Imposterism Scale (LIS) (7 questions)</td>
<td></td>
</tr>
<tr>
<td>RQ2. To what extent, if any, do the program factors of university and time in program predict imposterism in male-dominated, online graduate programs?</td>
<td>Survey questions from the adapted Rovai Classroom Community Scale (ACCS) (20 questions)</td>
<td>Standard multiple regression</td>
</tr>
<tr>
<td></td>
<td>Survey Questions gathering demographic information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Survey Questions from the Leary Imposterism Scale (LIS) (7 questions)</td>
<td></td>
</tr>
</tbody>
</table>

A standard multiple regression analysis was used to answer the research questions because multiple predictor variables were used with one criterion variable (Urdan, 2017). Assumptions for multiple regression testing include sample size, multicollinearity and singularity, which were checked by examining tolerance and Variant Influence Factors (VIF) (Pallant, 2020); outliers, which were checked by examining Cooks’ distance values which are produced with the SPSS output; and normality, linearity, homoscedasticity, and independence of residuals, described as the following:
• Normality: The residuals should be normally distributed about the predicted dependent variable scores. This was checked by a visual inspection of the scatterplot produced with the SPSS output.

• Linearity: The residuals should have a straight-line relationship with predicted dependent variable scores; this was established by inspecting the scatterplot produced by SPSS to ensure there is rectangle distribution with most scores centered around zero (Pallant, 2020).

• Homoscedasticity: The variance of the residuals around predicted dependent variable scores should be the same for all predicted scores; the scatterplot was inspected for funneling of the graph (Field, 2018).

• Independence of residuals: The residuals of the model are normally distributed (Pallant, 2020; Tabachnick & Fidell, 2013). This was checked by the Durbin-Watson statistic which produced with the SPSS output. The Durbin-Watson statistic can range from 0 to 4, but a value close to 2 indicates there is no correlation between residuals (Laerd, 2015).
Chapter Four: Results

Introduction

The purpose of this predictive correlational study was to see if and to what extent personal and program factors predict imposterism scores among graduate students in fully online, traditionally male-dominated programs. The survey was emailed to 396 students (233 from Southeastern University and 163 from the University of the Midsouth). Several follow-up reminders were sent at weekly intervals to potential participants in both sites. Seventy-one participants submitted survey responses. Out of the 71 responses, 11 failed to complete at least 60% of the survey, and 1 was in a program that is not fully online. Thus, 12 responses were removed from analysis, leaving a total of 59 surveys used in data analysis. The response rate was 14.9%.

Descriptive Statistics

Demographics

The participants were almost evenly divided between male (n = 30, 50.85%) and female (n = 29, 49.15%). The majority were Caucasian (n = 44, 74.6%) and of non-traditional age, over 25 years-old (n = 43, 72.9%). Participants represented two universities. Southeast University had more participants (n = 32, 54.2%), and included students from the Master of Business Administration (MBA; n = 26, 81.5% of all responders from that university) and Master of Accounting (MAcc; n = 6, 18.8% of responders) programs. University of the Midsouth represented 27 participants (n = 27, 45.8%) and included students from MBA (n = 22, 81.5% of all responders from that university), Master of Science in Accounting (n = 4, 14.8%), and Master
of Science in Engineering \((n = 1, 3.7\%)\) programs. Twenty-nine participants had 2-5 years of prior expertise in the subject. Additionally, 13 students completed 1 semester (21.7\%) and 12 had completed three semesters (20\%). First generation students were in the minority of responders \((n = 18, 30.5\%)\). The descriptive data is summarized in Table 7.

**Table 7**

*Frequency Count of Participant Demographics*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>(N)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Over 25</td>
<td>43</td>
<td>72.9</td>
</tr>
<tr>
<td></td>
<td>18-24</td>
<td>16</td>
<td>27.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>30</td>
<td>50.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>29</td>
<td>49.2</td>
</tr>
<tr>
<td>First Generation</td>
<td>No</td>
<td>41</td>
<td>69.5</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>18</td>
<td>30.5</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian</td>
<td>44</td>
<td>74.6</td>
</tr>
<tr>
<td></td>
<td>Asian</td>
<td>5</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>African American</td>
<td>4</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>Latino or Hispanic</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Other/Unknown</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Prefer not to say</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>Years of Expertise</td>
<td>2-5 years</td>
<td>29</td>
<td>48.3</td>
</tr>
<tr>
<td></td>
<td>0-1 year</td>
<td>17</td>
<td>28.3</td>
</tr>
<tr>
<td></td>
<td>More than 15 years</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>6-10 years</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>11-15 years</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>University</td>
<td>Southeast</td>
<td>32</td>
<td>54.2</td>
</tr>
<tr>
<td></td>
<td>University (SU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>University of the Midsouth (UM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program (SU)</td>
<td>Business Administration (MBA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81.5</td>
<td></td>
</tr>
</tbody>
</table>
The survey included demographic questions to gather information on four variables: gender, years of expertise in the subject (YoE), university (Univ), and time in program (measured in semesters, TiP). To measure sense of community, the survey included Rovai’s Classroom Community Scale (CCS) which the researcher adapted by replacing “classroom” with “program” to become the Adapted Classroom Community Scale (ACCS; see Table 5 in Chapter 3 detailing the question adaptations). Lower scores indicate lower sense of community and higher scores represent a higher sense of community. Some items were reverse coded as appropriate to ensure negatively worded items were scored correctly. The ACCS scores ranged from 20 to 85 with a mean score of 55. To measure imposterism, the study’s survey included

<table>
<thead>
<tr>
<th>Table 7 (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>Accountancy (MAcc)</td>
</tr>
<tr>
<td>Business Administration (MBA)</td>
</tr>
<tr>
<td>Accounting (MS)</td>
</tr>
<tr>
<td>Engineering Technology (MS)</td>
</tr>
<tr>
<td><strong>Time in Program</strong></td>
</tr>
<tr>
<td>More than 8 semesters</td>
</tr>
<tr>
<td>8 semesters</td>
</tr>
<tr>
<td>7 semesters</td>
</tr>
<tr>
<td>6 semesters</td>
</tr>
<tr>
<td>5 semesters</td>
</tr>
<tr>
<td>4 semesters</td>
</tr>
<tr>
<td>3 semesters</td>
</tr>
<tr>
<td>2 semesters</td>
</tr>
<tr>
<td>1 semester</td>
</tr>
</tbody>
</table>
Leary’s 7-item Imposterism Scale (LIS). The LIS scale has a maximum score of 35, with a lower score indicating lower imposterism feelings and a higher score indicating higher imposterism feelings. Scores ranged from 7 to 33 with a mean score of 15.37. Table 8 identifies the mean and standard deviation of participant scores on these instruments. Both instruments used in the study were reliable, with the following Cronbach alpha values computed from this study: ACCS total scale: (α = .93), LIS Scale (α = .93)

**Statistical Analysis**

**Research Questions 1 and 2**

Research question 1 asked what relationship the personal factors of gender, years of expertise in the subject, and sense of community scores have with imposterism scores. Research question 2 asked what relationship the program factors of university and time (number of semesters) in the program has on imposter scores in graduate students enrolled in fully online, male-dominated programs.

**Descriptive Statistics**

Means and standard deviations for the imposterism criterion variable [LIS] and predictor variables (years of expertise [YoE], sense of community [ACCS], university [Univ], and time in program [TiP]) are reported in Table 8.

**Table 8**

*Descriptive Statistics (N=59)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imposterism (Criterion Variable)</td>
<td>1-5</td>
<td>15.37</td>
<td>7.029</td>
</tr>
</tbody>
</table>
A correlation matrix demonstrating the association among the variables was completed. The correlation coefficients reported in Table 9 mostly yielded weak relationships using Pearson correlation values (Urdan, 2017). Table 9 shows a very weak, negative correlation between gender and imposterism scores, a weak, negative relationship between years of expertise in the subject and imposterism scores, a moderately positive relationship between sense of community scores and imposterism scores, a weak, positive relationship between university and imposterism scores, and a weak, positive relationship between time in program (in semesters) and imposterism scores.

**Table 9**

*Correlation Matrix (N=59)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>LIS</th>
<th>Gender</th>
<th>YoE</th>
<th>ACCS</th>
<th>Univ</th>
<th>TiP</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIS</td>
<td>_____</td>
<td>-.004</td>
<td>-.17</td>
<td>.39</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>Gender</td>
<td>_____</td>
<td>.04</td>
<td>-.24</td>
<td>-.12</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>YoE</td>
<td>_____</td>
<td></td>
<td>-.16</td>
<td>-.35</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>ACCS</td>
<td>_____</td>
<td>.22</td>
<td></td>
<td></td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>Univ</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.13</td>
</tr>
<tr>
<td>TiP</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LIS = imposterism, YoE = years of expertise, ACCS = sense of program community, Univ = university, TiP – time in program
Assumptions Tests

Assumptions tests were conducted to ensure accurate regression analysis (Pallant, 2020). First, sample size was examined to determine if multiple regression could be conducted. Then tests regarding independence of observations, linearity, homoscedasticity, normality, and multicollinearity were conducted.

Sample Size

Multiple recommendations exist on effective sample sizes for multiple regression. A GPower analysis (recommended by Creswell & Creswell, 2018; see Appendix C) allowing for an effect size of .15 and a confidence level of .95 and computing six total variables (1 criterion and 5 predictors) resulted in a recommended sample size of 138. A sample size based on Tabachnick and Fidell’s 2013 formula, $N > 50 + 8m$, where $m$ is the number of predictor variables, resulted in a recommended sample size of 90. Ultimately, this project moved forward with a sample size of 59, which exceeds Harris’s 1985 suggestion that the number of participants should exceed the number of predictors by at least 50, so long as 5 or less predictors are used (Van Voorhis & Morgan, 2007).

Independence of Observations

Independence of observations, which means each observation or measurement must not be influenced by any other observation or measurement (Pallant, 2020) is important to reliable results. The independence of observations analysis, as assessed by a Durbin-Watson statistic of 2.43, indicates the assumption of independence of observations is reasonable and the residuals
are uncorrelated (Warner, 2021). The Durbin-Watson statistic can range from 0 to 4, but a value close to 2 indicates there is no correlation between residuals (Laerd, 2015).

**Linearity, Homoscedasticity, and Normality**

Linearity was tested using a scatterplot to decrease the chance of errors (see Figure 3). After inspecting the scatterplot there was evidence of rectangle distribution with most scores centered around zero (Pallant, 2020). There were also no visible curves in the graph, which indicates linearity is not being violated (Field, 2018). Homoscedasticity was also assessed using Figure 3. Inspection of the scatterplot revealed no funneling of the graph, providing no evidence of homoscedasticity violations (Field, 2018). Finally, no outliers above 3.3 or below –3.3 are detected in Figure 3. Additionally, Mahalanobis distance calculation (13.76) did not exceed the maximum value of 20.52 for five independent variables (Pallant, 2020).
Multicollinearity was examined using Tolerance and Variant Influence Factors (VIF) (Pallant, 2020) as seen in Table 10.

Table 10

Collinearity Statistics

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Tolerance</th>
<th>Variance Inflation Factor (VIF)</th>
</tr>
</thead>
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<tr>
<td>Gender</td>
<td>.94</td>
<td>1.07</td>
</tr>
<tr>
<td>YoE</td>
<td>.87</td>
<td>1.15</td>
</tr>
<tr>
<td>ACCS</td>
<td>.89</td>
<td>1.12</td>
</tr>
<tr>
<td>Univ</td>
<td>.84</td>
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</tr>
<tr>
<td>TiP</td>
<td>.98</td>
<td>1.02</td>
</tr>
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The tolerance values were greater than 0.1 (the lowest is .84) and the VIF values are less than 10 (the greatest is 1.20), resulting in confidence that the assumption of multicollinearity is not violated (Pallant, 2020). Next, the scatterplot (Figure 4) was examined to ensure there were no outliers of more than 3.3 or less than -3.3 (Pallant, 2020).

Figure 4

*Scatterplot*

Additionally, the Cooks’ distance values were less than 1, ranging from .000 to .148. No significant outliers exist. The residuals were normally distributed as observed in the P-P Plot (Figure 5):
Figure 5

P-P Plot

Multiple Regression

After determining that all assumptions were met, the data was prepared for a standard multiple regression and performed with the total imposterism (LIS) score as the dependent variable and gender, years of expertise in the subject (YoE), sense of community score (ACCS), university (Univ), and time in program TiP, measured in semesters) entered into the model simultaneously as independent variables. Research question 1 asked whether there was a relationship between personal factors of gender, years of expertise in the subject, and sense of program community scores. The null hypothesis for research question 1 states that there is no statistically significant, predictive relationship between the personal predictor variables (gender,
years of expertise in the subject, and sense of community scores) and graduate students’ imposterism scores. Research question 2 asked whether there was a relationship between program factors of university choice and time in program. The null hypothesis for research question 2 states that there is no statistically significant, predictive relationship between the program predictor variable (time in program measured in semesters) and graduate students’ imposterism scores. Analysis was performed using IBM SPSS 29.0.1.0. The individual contribution of each variable in the model was analyzed using the significance values in the coefficient table (see Table 11).

Table 11

*Standard Multiple Regression Results for Imposterism (LIS)*

<table>
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<tr>
<th>Variable</th>
<th>B</th>
<th>95% CI for B</th>
<th>p Value</th>
<th>R²</th>
<th>ΔR²</th>
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<td></td>
<td></td>
<td>LL</td>
<td>UL</td>
<td></td>
<td></td>
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<td>11.45</td>
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<td>.48</td>
</tr>
<tr>
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<td>-.64</td>
<td>-2.06</td>
<td>.78</td>
<td>-.12</td>
<td>.37</td>
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<tr>
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<td>.09</td>
<td>.38</td>
<td>.42</td>
<td>.002</td>
</tr>
<tr>
<td>Univ</td>
<td>.25</td>
<td>-3.98</td>
<td>3.48</td>
<td>-.02</td>
<td>.90</td>
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<tr>
<td>TiP</td>
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<td>-.12</td>
<td>1.44</td>
<td>.21</td>
<td>.09</td>
</tr>
</tbody>
</table>

*p = <.01

There is some evidence to reject the first null hypothesis because sense of program community (ACCS) is significant. Additionally, while hypothesis 2 was not significant, time in program is approaching significance. The unstandardized coefficients (B) show that years of expertise in the subject is negatively associated with imposterism scores, and gender and time in program are positively associated with imposterism scores. Together, these predictors accounted for 14% of the variance in imposterism scores (Urdan, 2017). $R^2 = .22$, which indicates the
addition of all the independent variables into the regression model explained 22% of the variability of the dependent variable, imposterism scores (LIS). The adjusted $R^2 = .14$, shows a small effect size (Laerd, 2015). The independent, personal variables of gender and years of expertise in the subject (H01) and program variable of university (H02) did not significantly predict imposterism scores ($5, 53) = 2.93, p > .10.$

**Summary**

In summary, 59 graduate students from fully online, traditionally male-dominated programs participated in this predictive correlational study examining possible variables associated with imposterism. The study began with an analysis of descriptive statistics and correlations. After reviewing the assumptions for regression analysis, no gross violations emerged. For hypothesis 1 (H01), sense of community (ACCS) is significant at the $p = <.01$ level. Sense of community scores and time in program contribute to the model's ability to predict imposterism in this population. The next chapter will discuss these findings in light of existing literature, present limitations, describe conclusions, and offer recommendations for future research.
Chapter Five: Discussion and Conclusions

Women are highly sought after for business and STEM academic programs (Blackburn, 2017; Espinosa, 2011; Flynn et al., 2020; Francis et al., 2017; Fry, 2021; Harsh, et al., 2012; Huber et al., 2022; NCSES, 2021; Palumbo, 2016; Raile et al., 2022; Weeden et al., 2020). Imposterism, a phenomenon where individuals feel “an internal experience of intellectual phoniness” (Clance & Imes, 1978, p. 241), is present in academia as a whole (Bothello & Roulet, 2019; Breeze, 2018; Edwards, 2019; Gadsby, 2022; Handforth, 2022; Vaughn et al., 2020; Watson & Betts, 2010), but literature suggests imposterism may be particulary experienced by women in traditionally male-dominated environments (Edwards, 2019; Harvey & Katz, 1985; King & Cooley, 1995; Parkman, 2016). Students experiencing imposter feelings tend to exhibit signs of procrastination, perfectionism, and self sabotage (Young, 2011). As more traditionally male-dominated graduate programs move from on-ground to fully online programs, administrators and faculty need to understand the presence of imposterism in their programs and explore what can be done to address conditions that exacerbate the experience among students.

This study aimed to explore two research questions: First, does any relationship exist between the personal factors of gender, years of expertise in the subject, sense of program community, and imposterism scores. Second, does any relationship exist between the program factors of university time in program, and imposterism scores. The survey used in this study included 35 questions and was a combination of two validated instruments used in previous research (Appendix B). The non-randomized, convenience sample was drawn from two southeastern, 4-year universities with multiple fully online, traditionally male-dominated graduate programs. Standard multiple regression was used to analyze participants’ survey
responses \( n = 59 \) to accept or reject the study’s null hypotheses. This chapter will interpret the findings in light of existing research and discuss implications for practice among fully online graduate programs’ administrators and faculty to more fully understand the experience and implications of imposterism among their graduate student population.

**Findings Discussion**

The findings of this study produced mixed results for both research questions. The personal and program variables were identified using knowledge of imposterism and sense of community literature including the Institutional, Program, and Professional (IPP) framework for online education (Shepherd & Bolliger, 2023). For research question one, it was notable to see that a stronger sense of community positively predicted imposterism scores \( p = .002 \); as sense of program community increased, so did imposter feelings. The theory was that strong sense of community in students would mitigate imposterism (Chapman, 2015; Parkman, 2016). For research question two, it is notable that time in program (measured in semesters, TiP) shows a near-significant positive correlation with imposterism scores \( p = .09 \). Sense of community literature emphasizes the intermingling of newer members with older members of the community which, over time, increases sense of trust and nurtures relationships of mutuality. This bidirectional (McMillan & Chavis, 1986) relationship of both being shaped by the community and contributing to the community – this feeling of shared acceptance – seemed like it would cause imposter feelings to decrease. Perhaps most notable in light of the literature is that neither gender nor years of expertise (YoE) had a significant correlation with imposterism scores. The literature suggested that women experience more imposterism (Edwards, 2019; Harvey & Katz,
Additionally, expertise or acceptance in one (business) community theoretically would have transferred to the academic community, thereby decreasing the sense of imposterism. It could be that imposterism is a phenomenon caused by both individual and social factors (Cohen & McConnell, 2019; Breeze, 2018; Handforth, 2022; Hook, 2022; Kwak, 2023; Mullangi & Jagsi, 2019; Tulshyan & Burey, 2021) that is indeed so strong that it overwhelms variables that theoretically should have mitigated imposter feelings, namely sense of community and time in program (Handforth, 2022; Parkman, 2016). The findings and recommendations will be discussed below in light of literature on gender, sense of community, and imposterism in higher education.

Gender and Imposterism

The literature on imposterism in academia clearly states imposterism is a social phenomenon as well as an individual one and that context exacerbates feelings of imposterism for those who are the minority (Breeze, 2018; Breeze et al., 2022; Chapman, 2015; Edwards, 2019; Gadsby, 2022; Handforth, 2022; Larsen, 2020; Lewis & Quinell, 2022; Parkman, 2016; Watson & Betts, 2010). In the United States, business programs like the ones represented in the sample are traditionally male-dominated (Raile et al, 2022). Increasingly, researchers are considering imposterism a consequence of the gendered environment of academia where minorities are labeled as outsiders (Breeze, 2022; Lewis & Quinell, 2022; Olberding, 2018; Stone & O'Shea, 2013; Watson & Betts, 2010) and theorizing that this outsider status increases the likelihood of imposter feelings. However, in this study, gender did not predict an increase in imposterism scores. One possibility is that the sample sites are not male-dominated. While
Southeast University’s male enrollment did outnumber women in the business program, at the University of the Midsouth, the women actually outnumbered the men (see Tables 3 and 4 in Chapter 3). It could be that the women surveyed are not experiencing minority status in these programs at this time. Traditionally, business was thought of as a male dominated profession, but that dynamic may be changing as a result of equity efforts on behalf of women. Additionally, it is possible that when women are the minority, they are not having a negative experience that they attribute to being the minority gender. For example, women may not be experiencing the gender bias (Blackburn, 2017; Palumbo, 2016; Raile et al., 2022), harassment (Barthelemy et al., 2016; Dresden et al., 2018), and encouragement to de-emphasize feminine characteristics in favor of masculine ones (Flynn et al., 2020; Francis et al., 2017) noted in Chapter 2.

Another important consideration regarding gender is that all of the participants are enrolled in fully online graduate programs, and there is some argument that online learning may level out what would be a traditionally gendered experience. Bawa’s literature review on retention in online courses (2016) noted that online learning may decrease sexist environments and experiences because it provides “‘virtual’ anonymity and protection from being at the receiving end of discriminatory behavior” (p. 2). It could be that the present findings reflect Bawa’s observation and that the online environment mitigates the historical sense of alienation and difference women in business and STEM had been experiencing. After all, it is unlikely that the literature identifying gender discriminations was conducted exclusively in fully online programs. Future studies should include scales measuring and establishing women’s experiences in these environments to see if they are indeed as gendered and off-putting as the literature has documented in the past.
Years of Expertise and Imposterism

Imposterism can be characterized by extreme self-doubt about one’s abilities despite evidence to the contrary (Breeze et al., 2022) and often appears when persons are trying to enter into a community of learning or practice such as transitioning from scholar to professional (Bothello & Roulet, 2019; Christensen et al., 2016; Mulholland et al., 2023). Many students in fully online graduate programs are of nontraditional age (Stoessel et al., 2015). Occasionally students come into graduate studies with experience in the workplace where they have become practitioners in their fields (Ari & Arslan-Ari, 2022; Miller, 2017). Years of expertise was identified as a variable that might relate to the experience of imposterism. The idea was that having some experience with the subject may alleviate some of the imposter feelings and thereby lower the imposterism score. Although the standardized Beta weight suggests lower perceptions of imposterism as individuals gain more years of expertise (B = -.12), it was not significant (p = .37). Years of expertise did not seem to influence feelings of imposterism. This seems to reinforce the definition of imposterism as feeling as if one does not belong despite evidence to the contrary (Breeze et al., 2022). However, one might argue that expertise and membership in one community, such as a workplace, do not translate to another community, like academia, because it has different membership and possibly different norms. Therefore, the individual must put in the work to establish relationships in both places. This possibility puts emphasis on relationships rather than knowledge or skills. Future studies should inquire about participants’ sense of community in the workplace and compare it to sense of program community in these fully online programs.
Sense of Program Community and Imposterism

Based on the concept of imposterism as both an individual and a social phenomenon, as well as the definition of sense of program community (SoPC) as interactions beyond course boundaries that support “feelings of trust, connection, and affiliation among students, faculty, and staff” (Shepherd & Bolliger, 2019, p. 1), this study expected to see less imposter feelings as sense of program community increased. However, the opposite appears to have occurred. Higher feelings of community predicted higher feelings of imposterism. This positive finding between (SoPC) and imposterism could indicate there is a period of time after a student has entered the community where the feelings of difference are stronger than any feelings of becoming part of the community. Or, it could indicate that sense of program community and the experience of imposterism are more different than expected. The concept of community established in Chapter 2 emphasizes characteristics of effective learning communities, especially a sense of belonging and identification, reciprocity, fit, and regular, intentional interaction (Graves, 1992; Lave & Wenger, 1991; McMillan & Chavis, 1986; Wenger et al., 2002). Persons suffering from imposterism believe that sooner than later they will be found out and revealed to be unqualified to remain in the community to which they have been admitted (Clance & Imes, 1978; Mullangi & Jagsi, 2019; Sakulku & Alexander, 2011). The nature of imposterism is that the person experiencing imposter feelings does so despite evidence to the contrary (Breeze et al., 2022). So, a student may be experiencing bi-directional relationships and producing artifacts with and for the community but still feel as if they do not belong to the larger professional community. The
finding indicates that imposter feelings may be stronger or more powerful than sense of program community.

However, another possibility is that students in this sample who are experiencing imposterism sought out schools with strong sense of program community, and that, despite their feelings of connectedness to their programs, their imposterism remains. For example, it could be that women are comfortable in their program communities in the schools they have chosen but are not able to envision the transition from scholar to professional because there is not appropriate modeling or mentoring (Blackburn, 2017; Chesler & Chesler, 2002; Rockinson-Szapkiw et al., 2022) – they may not see people who look like them inhabiting professional roles – and that may explain both the positive sense of program community and the presence of imposterism.

Additionally, students’ comfort with the program community may have led to their honesty about their feelings of imposterism shared in the survey. Men, in particular, may feel that culture is more accepting of their experience of imposterism in ways they could not have in the past. Still another possibility is that these numbers are reflecting students’ sense of program community amongst their peers, but these numbers aren’t capturing how they feel about authority figures who may function as gatekeepers further on in the program and profession as students begin navigating the transition from scholar to professional, an area where imposterism often appears (Bothello & Roulet, 2019; Christensen et al., 2016; Mulholland et al., 2023). A final possibility is raised by Cohen and McConnell (2019) who propose that in “high achievement environments” (p. 460) like graduate school, individuals are likely to judge themselves more harshly and give lower self-evaluations (or in this case, higher imposterism
scores). Future studies may explore specific elements of program community (such as feelings of connectedness to persons holding different roles in the program) alongside specific elements of imposterism (such as feelings of fraudulence) to see if there is a predictive relationship.

**Time in Program and Imposterism**

In this study, as time in program increased, so did imposterism scores, though they were non-significant. Tinto (1993) and others (Baker & Pifer, 2011; Pifer & Baker, 2016) suggest that at the end of one’s graduate program, focus is turned to the future and what it might look like to enter the profession. In the beginning stages of graduate school students are trying to get grounded in their programs, but toward the end of their programs, they are wondering if their preparation is going to pay off professionally. In this light, increased imposterism makes sense as students may be questioning whether their success as students will translate to success as professionals. Additionally, it could be that students who are developing more slowly are experiencing more imposterism, or that students who do not experience imposterism have already left the program and therefore are not represented in the survey’s participants. Future studies should measure sense of program community and imposterism longitudinally at different phases of development from student to researcher to professional to see what differences or progressions exist.

**Limitations**

Limitations include the fact that imposterism in academia is a growing topic, so identification of variables was difficult. But as the study of imposterism in academia continues to grow, variables related to imposterism will continue to be identified (see, for example, Cohen &
Regarding sample size and geographical range, only querying two schools in one region of the country leads to low geographic comparisons. Also, because the researcher only queried two schools, the sample size was very small, which impacts the ability to generalize the findings to the entire population. These fully online programs, especially in STEM, are beginning to grow, but many are in their infancy as evidenced by the smaller numbers at both universities. In fact, during this research project, University of the Midsouth began a new master's in chemistry that will begin in the upcoming semester, but there is not yet enrollment. Future studies may remedy this by including participants from additional schools in the region, understanding that these programs are small, so querying multiple schools is essential to obtaining an effective sample size.

Additionally, not enough information about similarities and differences in the universities and programs was gathered to theorize about a possible relationship. Also, the sample of this study was mostly white, male Master of Business Administration (MBA) students at Southeast University. Participation from STEM students was almost nonexistent \((n = 1)\), and in the University of the Midsouth programs, women outnumbered men. The sample may not be representative of the larger population of fully online graduate students in traditionally male-dominated programs of study.

Finally, as Rovai (2002c) noted in his research, “the measurement of sense of community [is] limited to self-report measure” (p. 330), so participants’ responses may reflect response and/or selection bias. For example, women who suffer from imposterism may not choose to enter traditionally male-dominated programs, so imposterism scores may have been different because
these women may have selected out. Finally, prediction is not causation (Urdan, 2017). This study demonstrates that relationships exist, but more inquiry is required.

**Implications for Practice**

For program administrators and faculty of fully online programs in traditionally male-dominated subject areas, there are several implications for practice given that imposterism is present in fully online graduate programs despite feeling a sense of program community. These leaders need to consider the following actions:

- Explore how the experience of imposterism relates to their students’ satisfaction and attrition. For example, what might imposterism behaviors such as procrastination, perfectionism, and self-sabotage (Young, 2011) look like in these particular disciplines in different phases of the programs, and how can faculty and administrators intervene on students’ behalf?
- Discern when in their programs students are experiencing imposterism and what form those imposterism feelings and actions are taking. In this way they may be able to learn more about what may be exacerbating the imposterism feelings in order to create interventions, both individually and socially, for students.
- Continue designing course and program experiences that build and support program community among students of all program phases. While this study showed increase of imposterism scores as sense of program community increased, the study of imposterism in academia as a social phenomenon is still emerging, and the relationship between sense of community and imposterism needs to be further clarified. For example, a 2019 study
by Cohen and McConnell found that increased isolation from faculty and peers was associated with more frequent imposterism. So there is work to be done to tease out variables related to both “sense of program community” and “imposterism” and many future studies to be conducted on possible relationships between the two concepts. That being said, the findings on sense of community and its relationship to online student satisfaction and retention have been proven consistently over time, so planning for and nurturing sense of program community for online students should continue to be a priority for leaders.

- Communicate to students in all phases of the student to scholar to professional development the importance of program community as a means of becoming part of a community of learners with whom one can learn and further both academic and professional growth. This is important for nontraditional students, especially, who may already be in communities outside of the school environment (families, workplaces) and may not feel the need for program community at the university (Bolliger et al., 2019).

- Communicate to students in both courses and throughout the program the very real presence and characteristics of imposterism. Normalize imposter feelings at all phases of the program.

- Consider incorporating alumni prominently in program activities as a way to possibly mitigate imposterism for both late-stage graduate students and early-career professionals. Letting all students and alumni know they are part of a program of support may help both
students and alumni become more accepting of their imposter feelings as they work to integrate into new communities of learning and practice.

**Conclusion**

In conclusion, sense of program community and time in program predicts imposterism. This study contributes to sense of program community and imposterism literature in academia by beginning to explore the possible connections. This study shows that students in fully online graduate programs in traditionally male dominated fields are experiencing both program community and imposterism.
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Appendix A: IRB Approvals

IRB approvals from the University of Memphis and Tennessee Technological University for Summer 2023, and Spring 2024.

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<thead>
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<td>Imposter Phenomenon and Sense of Community in Non-Traditional Women Enrolled in Fully Online Graduate Programs</td>
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<td>Status</td>
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<tr>
<td>Principal Investigator</td>
<td>Heather Rippetoe</td>
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<tr>
<td>Review Board</td>
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**Study History**

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**Key Study Contacts**

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</thead>
<tbody>
<tr>
<td>Craig Shepherd</td>
<td>Co-Principal Investigator</td>
<td><a href="mailto:cshph2@memphis.edu">cshph2@memphis.edu</a></td>
</tr>
<tr>
<td>Heather Rippetoe</td>
<td>Principal Investigator</td>
<td><a href="mailto:hrpetteoe@memphis.edu">hrpetteoe@memphis.edu</a></td>
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<tr>
<td>Heather Rippetoe</td>
<td>Primary Contact</td>
<td><a href="mailto:hrpetteoe@memphis.edu">hrpetteoe@memphis.edu</a></td>
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Tennessee Tech University Institutional Review Board

IRB Certification Form for Employee Completing Degree Other Institution

Project Title: Impact of Fraternities and Sororities on Non-Traditional Women Enrolled in Fully Online Graduate Programs

Principal Investigator: Heather Rippetoe

Tennessee Tech University Only:

Date IRB Approval Letter Received: 3-5-23
IRB Approval Letter Acceptable: X Yes ☐ No

Tennessee Tech IRB acknowledges that the IRB approval letter has been received and is acceptable. The PI is authorized to begin recruitment for the study.

IRB Chairperson: Michael E. Clark

Date: 3-6-23

IRB Chairperson Name (Print): Acting Chair
Appendix B: Survey Instrument

Sense of Program Community and Imposterism in Online Graduate Students

Start of Block: Intro to Survey

Q7 Survey Information and Consent
Dear Online Student,

This study examines online graduate student perceptions of program community and imposter feelings, also known as imposterism, Imposter Phenomenon, and Imposter Syndrome. If you are in an online degree program (where the vast majority of courses are delivered online), we invite you to complete a ~7.5-minute, 35-question survey.

Participation is voluntary and will not influence your standing in your degree program or courses. All responses are anonymous and minimal risk (no more than slight anxiety in answering questions about what aspects of your program you feel are useful for community development) is involved. To express my gratitude for your time, you will be able to register for a drawing of one of ten $25 Amazon gift cards by following instructions at the end of the questionnaire. Since I am capping responses at 200, participants have at least a 5% chance of winning a $25 gift card.

You may withdraw or not complete this questionnaire at any time by closing your browser window. However, when you submit your responses at the end of the questionnaire, you explicitly express your informed consent to participate in this study.

The study has been approved by the IRB Offices at the University of Memphis. Later, if you have any questions, suggestions, concerns, or complaints about the study, please contact the principal investigator: Heather Rippetoe, at hrppetoe@memphis.edu. If you have any questions about your rights as a volunteer in this research, contact the Institutional Review Board Staff at The University of Memphis at 901-678-2705 or irb@memphis.edu.

Thank you for your participation!
End of Block: Intro to Survey

Start of Block: Demographic Questions

Q67 The first set of questions are for demographic purposes only.
D1 What is your age?

- Under 18 (1)
- 18-24 (2)
- 25 or older (3)

D2 What gender do you identify as?

- Male (1)
- Female (2)
- Other (6)
D3 Please specify your ethnicity (check all that apply).

- Caucasian (1)
- African American (2)
- Latino or Hispanic (3)
- Asian (4)
- Native American (5)
- Native Hawaiian or Pacific Islander (6)
- Other/Unknown (7)
- Prefer not to say (8)

D4 What is your university?

- Tennessee Technological University (4)
- University of Memphis (5)
D6 How long have you been in your program of study?

○ One semester (1)
○ Two semesters (2)
○ Three semesters (3)
○ Four semesters (4)
○ Five semesters (5)
○ Six semesters (6)
○ Seven semesters (7)
○ Eight semesters (8)
○ More than eight semesters (9)
D7 How many years of expertise do you have in the field you are studying?

- 0-1 year (1)
- 2-5 years (2)
- 6-10 years (3)
- 11-15 years (4)
- More than 15 years (5)

D8 Are you a first generation college student?

- Yes (1)
- No (2)

End of Block: Demographic Questions

Start of Block: TnTech Program of Study Block

Display This Question:
If What is your university? = Tennessee Technological University
TnTech Program of Study
Please select your program of study at Tennessee Tech:

- Accountancy (MAcc) (1)
- Business Administration (MBA) (2)
- Engineering Management (MSEM) (3)
- Mechanical Engineering (MS) (4)
- Professional Science in Environmental Informatics (PSM-EI) (5)
- Other (please specify) (6) ____________________________

End of Block: TnTech Program of Study Block

Start of Block: U of Memphis Program of Study Block

Display This Question:

If What is your university? = University of Memphis
Memphis Program of Study

Please select your program of study at the University of Memphis:

- Accounting (MS) (2)
- Business Administration (MBA) (1)
- Engineering Management (MS) (3)
- Engineering Technology (MS) (4)
- Other (please specify) (5) ________________________________

End of Block: U of Memphis Program of Study Block

Start of Block: SoPC Questions

ACCS Intro The next 20 questions are about Sense of Program Community in your online program.
ACCS 1 I feel that students in this program care about each other.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 2 I feel that I am encouraged to ask questions in my program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 3 I feel connected to others in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 4 I feel that it is hard to get help when I have a question in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 5 I do not feel a spirit of community in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 6 I feel that I receive timely feedback in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 7 I feel that this program is like a family.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 8 I feel uneasy exposing gaps in my understanding in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 9 I feel isolated in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 10 I feel reluctant to speak openly in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 11 I trust others in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 12 I feel that this program results in only modest learning.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 13 I feel that I can rely on others in this program.

○ Strongly agree (1)
○ Agree (2)
○ Neutral (3)
○ Disagree (4)
○ Strongly disagree (5)

ACCS 14 I feel that other students do not help me learn in this program.

○ Strongly agree (1)
○ Agree (2)
○ Neutral (3)
○ Disagree (4)
○ Strongly disagree (5)
ACCS 15 I feel that members of this program depend on me.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 16 I feel that I am given ample opportunities to learn in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 17 I feel uncertain about others in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 18 I feel that my educational needs are not being met in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
ACCS 19 I feel confident that others will support me in this program.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)

ACCS 20 I feel that this program does not promote a desire to learn.

- Strongly agree (1)
- Agree (2)
- Neutral (3)
- Disagree (4)
- Strongly disagree (5)
IP Intro The next 7 questions are about imposter feelings, also known as imposterism, Imposter Phenomenon, or Imposter Syndrome.

L1 Sometimes I am afraid I will be discovered for who I really am.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)
L2 I tend to feel like a phony.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)

L3 I'm afraid people important to me may find out that I'm not as capable as they think I am.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)
L4 In some situations I feel like an imposter.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)

L5 Sometimes I'm afraid others will discover how much knowledge or ability I really lack.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)
L6 In some situations I feel like a "great pretender"; that is, I'm not as genuine as others think I am.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)

L7 In some situations I act like an imposter.

- Not at all characteristic of me (1)
- Slightly characteristic of me (2)
- Moderately characteristic of me (3)
- Very characteristic of me (4)
- Extremely characteristic of me (5)

End of Block: Leary Imposterism Questions
Appendix C: Power Analysis Results (G*Power)

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