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IMPRESSIONS OF VIABILITY: HOW CURRENT ENROLLMENT MANAGEMENT PERSONNEL AND FORMER STUDENTS PERCEIVE THE IMPLEMENTATION OF A CHATBOT FOCUSED ON STUDENT FINANCIAL COMMUNICATION

Courtney Robinson
University of Southern Mississippi

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IMPRESSIONS OF VIABILITY: HOW CURRENT ENROLLMENT MANAGEMENT PERSONNEL AND FORMER STUDENTS PERCEIVE THE IMPLEMENTATION OF A CHATBOT FOCUSED ON STUDENT FINANCIAL COMMUNICATION

by

Courtney Robinson

A Doctoral Project
Submitted to the College of Education and Human Sciences
and the School of Education
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

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This Doctoral Project was approved by:

__________________________________________________
Dr. Holly Foster
Advisor

__________________________________________________
Dr. Sandra Nichols
Director

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ABSTRACT

The increasingly competitive modern higher educational environment has forced student services professionals to increase focus on recruitment and retention, which corresponds with an expanding body of scholarly literature and research on retention practices (Moore, Hossler, Ziskin, & Wakhungu, 2008). These large-scale recruitment and retention goals coincide with significant declines in state and federal funding, leaving many financially-limited institutions struggling to balance higher expectations and declining resources. Oftentimes, institutions seek out technological platforms that streamline the workload, while remaining cognizant that selected platforms must appeal to the current student population, the technologically-savvy Generation Z (Castillo, 2018; Stillman & Stillman, 2017).

Outside of higher education, chatbots, often presented as AI assistants, have proven their popularity via products like Amazon’s Alexa, Google Assistant, Microsoft’s Cortana, and Apple’s Siri (Dale, 2016). Now, this technology is appearing in higher education, where it has been implemented at several institutions to automate processes and facilitate communication between students and staff (Herndon, 2017).

The purpose of this action research study was to evaluate the perceptions, specifically linked to viability, of a chatbot that provides information to Southern Miss students in real-time. This research was focused on student finances and the communications that connect a student to his or her financial information.

This research found that there was significant support for financial aid and business services chatbots at USM. Although a chatbot would not alter most respondents’
enrollment plans, a majority of the former student respondents indicated that if an institution implemented a chatbot, they would have a better perception of that institution.
ACKNOWLEDGMENTS

First, to my parents, who always believed in any dream I ever had. You paid for journalism school, then helped me move to the Deep South after graduation so that I could quit journalism and realize my dream of working in higher education. I took the scenic route to get here, but I made it, and I wouldn’t change a thing. I could never have done it without your support and guidance, and your willingness to answer phone calls and texts at any time – day or night. You’re the reason I’m here, and as someone who can typically find the right words, I can find none that convey my gratitude for your love and support during this endeavor – and all the others I’ve started.

To Sarah, whom I look up to even though I’m older. Your my silent supporter, my rock, and my hero. You’ve always been a role model in continuing to grow and improve and to never give up. One day, I hope to have a fraction of your drive and tenacity. Until then, I’ll just continue being the nerdy sister, a notion solidified by this document.

To Jamie, who supported me while I spent the last three years pursuing this degree and this research. I thank you for forcing me to listen to podcasts against my will. If you weren’t such a fan of NPR, I never would have been introduced to Shankar Vedantam’s podcast on chatbots in higher education. Without that single experience, I’d never have become obsessed with this concept and written 200 pages on it that only four people will ever read. As one of my biggest fans, I know you’ll be amongst those four and I appreciate all of your love and support.

To my school squad – Sarah, Cristin, Donavan, Brent, Precious, Zack, and Xiaonan. I couldn’t have made it without those long nights of writing, navigating statistics, cramming for comps, and discussing the trials and tribulations of higher
education in the halls of Owings McQuagge. We’re a completely mismatched hodgepodge of people who found their way together, turning classes into degrees and friends into family. We’ve been through a lot together, and I couldn’t have done it without any of you.

To my dogs, Brees and Jack (rest in peace). You kept me calm when I was about to lose it. You more than made up for the cat, Oliver, who was a complete nuisance.

To Dr. Holly Foster, a true hero of higher ed. You went from professor to advisor to friend. If I can be half the advocate to my students that you’ve been to me, the future will be bright for them. Your ability to advocate for us during the last three years made this all possible.

To Zita Tiamuh, Juta Tammachart, and Dr. Garrett Hoffman, for helping me navigate the world of data, both quantitative and descriptive. This effort definitely took a village.

To community college students everywhere. Starting out at a two-year college doesn’t make you a failure and won’t make you less successful. Even if people tell you that you won’t accomplish anything, prove them wrong (see below).

To all my former teachers and professors who believed in me, as a writer, editor, and educator. And to Mrs. Shymko, who said I was a terrible writer and I better try something else. I’m glad I ignored your opinion.

To anyone else I may have missed. You’ve probably supported me in some way, but after writing this behemoth, I’ve run out of the ability to write even two more words. Thanks.
DEDICATION

In memory of my Grandpa Walker for always being proud of me. And for taking a photo with me on the first day of kindergarten, not long before I became a blubering mess and refused to go to school without a parent for weeks and weeks. Grandpa, I finished my doctorate, and I know you’d be proud.
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<tr>
<td><strong>AI</strong></td>
<td>Artificial Intelligence</td>
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<tr>
<td><strong>AIML</strong></td>
<td>Artificial Intelligence Markup Language</td>
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<tr>
<td><strong>CRM</strong></td>
<td>Customer Relationship Management</td>
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<td><strong>EFC</strong></td>
<td>Expected Family Contribution</td>
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<td><strong>FAFSA</strong></td>
<td>Free Application for Federal Student Aid</td>
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<td><strong>IHL</strong></td>
<td>Mississippi Institutions of Higher Learning</td>
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<td><strong>IRB</strong></td>
<td>Institutional Review Board</td>
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<td><strong>GSU</strong></td>
<td>Georgia State University</td>
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<td><strong>NASFAA</strong></td>
<td>National Association of Student Financial Aid Administrators</td>
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<tr>
<td><strong>NCAN</strong></td>
<td>National College Access Network</td>
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<tr>
<td><strong>NCES</strong></td>
<td>National Center for Education Statistics</td>
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<tr>
<td><strong>NLP</strong></td>
<td>National Language Processing</td>
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<tr>
<td><strong>NPSAS</strong></td>
<td>National Postsecondary Student Aid Study</td>
</tr>
<tr>
<td><strong>NSRP</strong></td>
<td>New Student and Retention Programs</td>
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<tr>
<td><strong>USM</strong></td>
<td>The University of Southern Mississippi</td>
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CHAPTER I – INTRODUCTION

In higher education today, student affairs leaders are often tasked with countless responsibilities, including increasing enrollment and improving retention. To meet these demands, significant programs and expansive technologies have been implemented to both attract and retain students. In recent years, higher education has undergone a series of unprecedented technological implementations that have altered many institutional functions (Tabata & Johnsrud, 2008), including the development of online course management systems and the use of platforms that support and guide the technologically-savvy prospective and current college students known as Generation Z, also referred to as iGen (Stillman & Stillman, 2017; Twenge, 2017).

This generation includes the traditional 18- to 24-year-old age range targeted for recruitment by most admissions offices; therefore, finding resources that attract and support this population throughout their collegiate career is necessary. For university officials, this requires staying abreast of the newest technologies and remaining hypersensitive to this generation’s advanced technical skillset, which varies greatly from the abilities of previous generations. Administrators must review and select viable tools that not only appeal to their target student population, but also meet the needs and expectations of the institution’s student services departments. One example of a technological device that can support Generation Z are chatbots, which are already used at several institutions to automate multiple processes and facilitate communication between staff and students (Herndon, 2017). For many colleges and universities, automated communication plans differ greatly from their current communication
strategies, which typically rely on mass emails and letters. While email and postal mail have some benefits, these forms of mass communication fail to consider that not all information is applicable to all students, which differs from the personalized attention that chatbots can provide.

The current communication strategy at The University of Southern Mississippi (USM) relies on generic mass communications, rather than the strategic interactions that can be provided by chatbots. Therefore, communication at USM is often reactive, rather than proactive, as students are typically required to solicit information from various departments. In their attempt to obtain the correct information on enrollment, financial aid, business services, and academic questions, students often experience repetitive and often cyclical phone and email transferring, unofficially known as the “Southern Miss Shuffle.” The researcher used professional experience working in three departments, Admissions, Financial Aid, and Business Services, coupled with extensive conversations with both students and staff who have experienced the shuffle as a basis for this inquiry. The ineffectiveness that cyclical shuffling across departments creates for students is a significant justification for this research, which is compounded by the inability to provide information to students in real-time. The challenge of delayed response time between inquiry and answer can be resolved using automated chatbots. Chatbots, which use natural language user interfaces to simulate oral- or text-based conversations without direct human involvement, could be a solution that addresses the challenges with the flow of information – while also improving the timeliness of information delivery (Brandtzaeg & Folstad, 2017; Taylor & McAleese, 2011). Within higher education, where timely communication of administrative decisions and accurate institutional policies can
dramatically affect student persistence (Berger & Braxton, 1998; Moore et al., 2008), a technological resource that conveys information and eases institutional navigation for students could aid in reducing student attrition.

Each student who leaves an institution prior to graduation takes his or her tuition and other fees with them, a revenue source that schools rely on to operate. Students who do not persist also cost institutions additional revenue, including tuition from future semesters and potential alumni-related giving (Raisman, 2013). This lack of revenue, coupled with declining state appropriations, make retention an urgent challenge for any institution with financial challenges. Despite this new focus on decreasing student attrition, research on retention dates back nearly 100 years.

Timely and streamlined access to information may improve educational outcomes; thus, this research solicited feedback from university enrollment management staff and former Southern Miss students to help identify potential communication barriers and gather perceptions on whether or not a chatbot would help facilitate communication between students and university staff. While chatbots already power automated marketing, customer relationship management (CRM) systems and even admissions decisions (Weiner, 2017), this research aims to determine the perceived viability of using a chatbot specifically to assist students in obtaining information related to their student finances, including financial aid applications, loans, refunds, and billing.

Chatbots, which already generate financial aid decision letters upon receipt at some institutions (Weiner, 2017), could be developed to provide integral and timely financial information to students. Since understanding cost of attendance and financial aid options are vital to student retention, matriculation, and persistence (Crosling,
Heagney, & Thomas, 2009; Deming & Dynarski, 2009) improving the student experience in this area is critical for retaining students. For colleges and universities with declining budgets, retaining more students also means maintaining a larger portion of revenue streams (Supiano, 2018b).

The benefits of a chatbot solution are multifaceted. By automating responses to common student finance inquiries, institutions can potentially decrease the time spent responding to repetitive email or phone messages, and instead use that time to provide additional student support (Weiner, 2017). Chatbots, which use pattern matching and natural language processing (NLP) to connect multiple patterns to a single response and aid interaction between computers and humans with realistic language patterns, are a natural fit for this type of assistance (Daulerio & Serna, 2017; Doucette, 2018; Gregori, 2017).

Outside of higher education, chatbots have already proven their popularity and this technology is now appearing in academia, where younger students are arriving on college campuses expecting technology that provides immediate feedback, which Generation Z students, born between 1995 and 2012, have become not only accustomed to, but dependent upon (Russo, Fallon, Zhang, & Acevedo, 2014; Stillman & Stillman, 2017; Twenge, 2017). Although it may be tempting for seasoned higher education administrators to ascribe terms like ‘impatient’ or ‘entitled’ to this generation, it is noteworthy to remember that this population is a cohort that has always had immediate access to information; therefore, they are accustomed to instant gratification, which is creating an on-demand economy and altering the way the world must communicate with them (Jaconi, 2014; Premack, 2018; Selingo, 2018a; Visser, 2018). Additionally, it is
crucial that the communication platforms shift, as “[s]ome campus leaders still talk about millennials as if they were the prototypical undergraduates. But enrolling now is Generation Z, the most racially diverse cohort in modern American history, one that grew up during the Great Recession and its aftermath, entirely in the era of the smartphone and social media” (Selingo, 2018a).

As educational consumers, these ‘digital native’ students expect high quality services and an assortment of communicative channels to satisfy their demand for immediate information (Moreno, 2017; Owen & Demb, 2004; Patel, 2017; Seemiller & Grace, 2017). Selingo (2018b) notes that, for this generation “growing up entirely in the era of the smartphone and social media means that Gen Zers see technology as an extension of themselves with respect to how they communicate, manage friendships, consume information, and learn,” (p.4) which means they expect a high-tech college experience. For Generation Z, many spend more time on their devices than they do with face-to-face interactions (Selingo, 2018b), as research now shows that the average teenager checks their phone more than 80 times per day (Twenge, 2017), which is evidence of their technological saturation (Madden, 2017). Based on the current behavioral patterns of this generation, incorporating chatbots into their higher education experience is a logical innovation.

Background, Current Trends, and Research

This research, which aims to analyze feedback on the perceived potential effectiveness of a chatbot prototype, is partially inspired by technological updates at Georgia State University (GSU), which launched its chatbot ‘Pounce’ in 2016 (See Appendix A). Pounce was developed by research that found that GSU students often
stalled at various stages throughout the admissions and financial aid processes; therefore, a significant percentage of prospective students failed to matriculate. This phenomenon is known as “summer melt,” which occurs when college-intending students fail to enroll at their chosen institution in the fall. At Georgia State, the loss of students began significantly impacting the institution’s enrollment as the university was projecting far more students to enroll in the fall than actually registered for classes (Supiano, 2018b). While the cause of summer melt varies from student to student, research used by GSU indicated the difficulty of completing many of the pre-matriculation administrative tasks as a contributing factor. These tasks, which many students struggled to complete during the summer, led Georgia State’s summer melt rate to increase (Supiano, 2018b).

Prior to the implementation of Pounce, the percentage of prospective GSU students melting had increased from 12% to 19%. Institutions with elevated levels of summer melt, like GSU, face many challenges because of decreased enrollment, including a lack of sufficient tuition revenue to cover institutional expenses. This loss of income demanded attention from the university. Recognizing that better communication may improve enrollment and decrease summer melt, GSU began a phone, postal mail, and email campaign to provide outreach; however, the work was completed manually, which quickly overwhelmed the admissions staff (Ravipati, 2017).

While the institution was unable to manually handle the newfound outreach campaign, administrators recognized the value of targeted outreach, and in 2016, GSU contracted with the technological start-up AdmitHub to design a chatbot that would answer student inquiries about admissions, financial aid, and other topics, all in real-time (Johnson, 2017). After using a pilot program chatbot through AdmitHub for one year,
summer melt at GSU dropped 4% and total enrollment jumped more than 3% within the test group, with projections indicating higher retention and an expected increase in future graduation rates (Hope, 2017).

Based on these initial results, Georgia State chose to continue using AdmitHub’s automated system instead of manual text messaging, which would have required adding 10 to 15 permanent admissions staff members to manage the traffic (Hope, 2017). By implementing Pounce instead of hiring staff, GSU saves a net of approximately $200,000 annually (Putz, 2017), spending less than $100,000 on the AdmitHub software (Jaschik, 2017), compared to hiring additional staff members to respond to these inquiries. The implementation of Pounce is now generating an additional $10 million in tuition and fees annually, based on new enrollments and increased retention of current students (Dimeo, 2017; Hope, 2017).

While Georgia State and Pounce serve as a model for this research, effective communication is at the core of a useful chatbot. While clear communication of student resources can help improve retention research has found that institutional challenges or barriers can increase student attrition (Scott, Shah, Grebennikov, & Singh, 2008). One of those critical barriers is access to necessary information like financial aid (Kreighbaum, 2017). At USM, this means connecting students to the information they need in a timely fashion, via a platform they can access, and using the language they understand.

This research is based on the possibility that chatbots, if effectively implemented at USM, could help alleviate the challenges students face when trying to obtain information. Automating and deriving correct answers directly from the institution’s CRM to the student’s virtual assistant, like Georgia State’s Pounce, could help prevent
students from being transferred on the telephone, having to walk to various offices around campus, or waiting for delayed email responses. Students could ask a question of the chatbot system and obtain an immediate response (Bawab, 2017; Dickson, 2018; Gardner, 2018a; Peterson, 2016; Supiano, 2018a). For students, this could facilitate the flow of information, and increase access to financial account updates in real-time, all of which has the potential to improve the student experience.

The Model Program: How Georgia State Pounced on the Chatbot

In the United States, the institution leading the chatbot revolution is Georgia State University, which implemented a chatbot to combat summer melt. After summer melt at GSU ballooned from nearly 12% to 19% in five years, GSU administrators designed and implemented an outreach campaign to students, to assist them with tasks that were leading to summer melt (Bawab, 2017). During the initial research, Georgia State administrators found that students often stalled in completing their financial aid application, failed to submit complete immunization records, and did not register for orientation, factors that contributed to an increase in summer melt. University administrators decided to prompt students to complete these steps.

Scott Burke, Georgia State’s associate vice president for undergraduate admissions, said he knew that providing text message reminders, or nudges, was the best way to reach students and help them matriculate, but admits he was concerned with adding a large manual text messaging workload to admissions officers. However, without another viable option at that time, the university started manual message-based outreach, which ultimately failed (Bawab, 2017; Herndon, 2017; Peterson, 2016). For example, if an institution received 50,000 text messages, and assuming it would take 30 seconds per
reply, which may vary, that would be 417 hours of manual responses – or 52 days (Daulerio & Serna, 2017).

The university considered moving the messaging campaign to emails, but rejected the idea, since new GSU students were then receiving about 300 emails from approximately 80 different departments, effectively oversaturating the students in information. It was then that GSU moved to automated text messaging via their own chatbot, Pounce.

Named after the institution’s mascot, Pounce was developed with the assistance of AdmitHub, a third-party provider that has also designed apps for West Texas A&M University, Arizona State University, Bowling Green State University, California State University-Northridge, and the University of Memphis (McKenzie, 2018a; Sosnik & Gong, 2017). At Georgia State, Pounce was designed to walk students through the FAFSA, provide a personalized checklist for admitted students, help students build class schedules, and answer a litany of student inquiries all in natural, conversational sentences (Bogardus Cortez, 2018; Peterson, 2016). For Georgia State, AdmitHub coordinated all the required GSU pre-enrollment tasks and routinely updated data on which tasks were completed. AdmitHub also uploaded a series of initial responses to frequently asked questions about these tasks and designed a process for the system to learn answers to questions for which no answer existed (Page & Gehlbach, 2017). Pounce was also designed to search the institution’s CRM and initiate actions from students via nudges, for example, reminding a student that his or her FAFSA had not been received, in addition to providing step-by-step guides to help students navigate the required tasks (Rowell & Prescott, 2018).
Rather than automating messages to all students, Pounce analyzed the institution’s data on each student’s completion of pre-matriculation tasks to evaluate where the student was struggling. Only then would Pounce send out a personalized text message to the student (Dickson, 2018). For example, Pounce could ask a student if they were bringing a car to campus, and if the student answered ‘no,’ the system would not send any additional information on parking or vehicle registration. By accessing student responses, Pounce could tailor messages to each students’ needs, and the students would then perceive the messages as relevant, which increased the likelihood they would engage with the system (Shafer, 2017).

After the end of a four-month test, 63% of the 3,114 students receiving messages via Pounce had engaged with the platform on at least three distinct days, each exchanging an average of 60 messages per student user (Herndon, 2017). Those students in the treatment group identifying as first-generation students sent 9.4% more messages than the average student, while Pell Grant recipients sent 31.7% more than the average Georgia State student. Additionally, Asian-American students sent about 3% more messages than the average student, while Hispanic students sent nearly 4% more messages (Herndon, 2017). At the end of the year, the treatment group had a 21.4% lower summer melt rate versus the control group, and a 3.9% higher enrollment rate. The implementation of Pounce also resulted in a 3.3% increase in orientation attendance, a 6.26% increase in on-time transcript submissions, a 9.3% increase in on-time immunization submissions, a 12.2% increase in loan acceptance, a 14.9% increase in student loan counseling, and a 16.85% decrease in FAFSA verification selection. After one year, the summer melt rate at Georgia State dropped to 14%, which added 300 new freshmen to the incoming class
(Bawab, 2017). If Pounce had been offered to the entire incoming class, rather than just the control group, Page estimates that Georgia State would have enrolled another 116 students (Supiano, 2018a).

To gather student insight on their experiences with Pounce, feedback was solicited, and found that 80% of respondents gave the program four or five stars with 94% recommending the program be offered to the entire incoming class after the randomized control trial (Herndon, 2017). Students overwhelmingly reported the casual nature of the communication platform as one of the main benefits (Herndon, 2017), which may imply a preference towards an emotional chatbot (Devlin, 2017).

In the first post-launch month, Pounce exchanged nearly 50,000 chatbot messages with more than 3,000 students, or 71% of the students who had been admitted, providing on-demand responses on questions addressing all aspects of student life from campus meal plans to financial aid offers to the campus pet policy. When it was implemented, Pounce had approximately 250 answers to frequently asked questions pre-loaded into the system, but by the end of the summer, Pounce’s knowledgebase had grown to more than 1,000 understandings, ranging from general inquiries to very specific questions, and it could provide responses in as few as seven seconds (Daulerio & Serna, 2017; Hope, 2017). To separate correct responses from incorrect information, each time a question was submitted, Pounce searched all institutional databases, laying on top of the existing technology. If the response generated by Pounce is less than 95% certain, the inquiry is emailed to a staff member, who responded to the student (Gardner, 2018a; Rowell & Prescott, 2018). When this occurred, the latest information became a part of the chatbot’s knowledgebase and would appear as the correct answer for future similar
inquiries (Hope, 2017), which made the chatbot smarter with every incoming question (Daulerio & Serna, 2017).

Georgia State’s technological advancements have also greatly impacted the institution’s financial aid process. At GSU, about 58% of its 52,000 students are eligible for Pell Grants and many are first-generation college students, which means they could not only benefit from additional, but also personalized information. The financial aid office was receiving nearly 2,000 calls per day from students in the weeks prior to the start of the semester, a volume the staff could not adequately handle (Renick, 2018). Again, Pounce was able to handle those inquiries (Craig, 2018; Gardner, 2018a).

Statement of Problem

Student finances and retention have been linked by researchers for decades, with discussions of rising costs, debt levels, and the impact of these challenges on students at the forefront of any higher education discussion (Britt, Ammerman, Barrett, & Jones, 2017; Schuh & Gansemer-Topf, 2005). Although it was not the intention of this research to improve enrollment and retention numbers, the intertwined nature of how finances influence these statistics makes it impossible to ignore them in their entirety. Yorke and Longden (2004) state “[i]n most institutional discussions, finance and related issues were raised as a significant disincentive to student persistence in higher education” (p. 125). They suggest two approaches: making direct financial support available and providing information and guidance regarding financial matters. While Yorke and Longden’s (2004) contention that many institutions lack sufficient financial aid opportunities is correct, the authors also emphasize a lack of information about financial aid as a contributing factor to student attrition. Accordingly, this research focused not on the
access to funding, but on the communicative platforms by which information about funding is transmitted.

In their book about Generation Z, Stillman and Stillman (2017) posit that it is possible that chatbots, providing automated and accurate information, are a practical way to connect to digitally-savvy students at their convenience and on their level. Substantial research denotes the absence of correct knowledge about financial aid among prospective students and their families as a contributing factor to attrition, although there remains a distinct lack of data on how perceptions of financial aid are influenced by the modes of delivery in which the information is conveyed (Perna, Lundy-Wagner, Yee, Brill, & Tadal, 2011).

Purpose of Study and Research Questions

The purpose of this research was to evaluate the potential viability and perceived functionality of a chatbot concept on former students and current student services professionals at The University of Southern Mississippi. This research analyzed the data collected from former students who left the institution prior to graduation and the student affairs professionals currently employed in the Office of Undergraduate Admissions, the Office of Financial Aid, Business Services, and the New Student and Retention Programs office. The research questions focused on the perceived efficacy of an artificial intelligence-based chatbot prototype on financial aid and retention and were designed for each population. The overarching research questions are listed below, which were accompanied by a graphic markup of the chatbot prototype:

Former Student Research Question:
1. As a former student at The University of Southern Mississippi, is a chatbot that automatically responds to student financial inquiries a viable communication tool?

Enrollment Management Staff Research Question:

1. As staff member in (admissions/financial aid/business services/retention office) at The University of Southern Mississippi, is a chatbot that automatically responds to student financial inquiries a viable communication tool?

Organization of the Doctoral Research Project

This doctoral research project is organized into four chapters. Chapter I presented the background, current trends, and research, an implementation example, the statement of problem, purpose of study, and the research questions. Chapter II is a review of literature that guides the narrative justification for this research, including research on student attrition and the connection to financial aid, a thorough discussion of verification navigation and summer melt, a review of the proposed concept, and an analysis of the benefits of nudging the digital native Generation Z. The theoretical framework, research design and methodology, and assumptions and limitations are detailed in Chapter III, and Chapter IV discusses the research findings, implications for current higher education practitioners, and opportunities for future research.
CHAPTER II – LITERATURE REVIEW

Plagued by discussions of high attrition and increased costs leading to staggering student loan debt, higher education has faced intense criticism in recent decades, seemingly centered on the value of the experience compared to the likely results (Fain, 2015; Karabell, 1998; Kennedy; 1997; Long, 2008; Taylor, 2010; Washburn, 2005). One of the prevalent discussions focuses on student retention and increasing attrition rates, which has forced higher education administrators to evaluate their institutional practices. According to The National Education Association 2009 Almanac of Higher Education, 25% of college students leave their institution prior to their second year, a percentage that is even higher for African American, Native American, and Hispanic students. Similarly, more than half of all American college students leave prior to completing a bachelor’s degree (Holzer & Baum, 2017; Selingo, 2018b), and 34% of traditional age freshmen fail to graduate within six years (Farrell, 2009).

Prior to the 1970s, students who left college prior to graduation were labeled as personal failures by society, and the institutions were not held responsible for that attrition (Tinto, 1975). However, research conducted in subsequent decades has helped shift this narrative, and modern student affairs practitioners now evaluate student attrition in psychological, physical, sociological, and financial contexts (Farrell, 2009).

Research on Student Retention and Attrition

From the early 1900s to today, undergraduate student retention has remained relatively stable at about 50%, which means that only half of all students entering a college or university will graduate. The earliest research into higher education student attrition began in the 1930s, although it was then referred to as “student mortality.”
Student attrition scholarship would expand in the 1950s and 1960s after World War II veterans enrolled in college in droves (Thelin, 2011). This enrollment boom was heightened by the passage of the 1965 Higher Education Act, which provided financial aid and created support opportunities for millions of students (Demetriou & Schmitz-Sciborski, 2011).

Despite the current study of retention as an educational subfield, it was not until 1975 that the modern discussion of student attrition commenced, spearheaded by Vincent Tinto’s seminal student integration model. As quoted in Jobe, Spencer, Hinkle, and Kaplan (2016), Tinto hypothesized “that students who socially integrate into the campus community increase their commitment to the institution and are more likely to graduate,” (p. 2) which significantly altered the way student affairs researchers evaluated and viewed student retention. While Tinto has continued to expand his work, declining enrollment and retention in the 1980s led to the incorporation of the practice of enrollment management (Lau, 2003). It was then that higher education researchers and practitioners redesigned retention efforts and refocused them into a university-wide approach, which focused on marketing, recruitment, admissions, financial aid, and student retention (Demetriou & Schmitz-Sciborski, 2011).

The diversification of higher education that occurred during the 1990s created new scholarship on how underrepresented populations and students from lower-socioeconomic backgrounds were supported by their institutions. In his 1993 work, Tinto focused on low-income students, African-American students, and transfer students, population subsets that often require specific supportive interventions. While focusing on resources to support these populations, Tinto (1993) also shunned institutions with
lackadaisical approaches to fixing attrition. In his justification, Tinto cites literature indicating a stereotypical depiction of student dropouts, which showcase these individuals “as having a distinct personality profile or as lacking in a particularly important attribute needed for college completion” (Tinto, 1993, p. 3), which fails to adequately explain the complexities of student attrition. In fact, Tinto (1993) suggests that institutional efforts made thus far to improve student retention have been largely unsuccessful.

However, Tinto (1993) argues that most institutions have yet to resolve the problem. Rather, he contends, colleges and universities typically treat retention concerns as they do all other issues to be addressed, by the “add a course” strategy, where administrators, when presented with a problem, add a class to deal with it, and assume it is resolved. Tinto (1993) noted this was also customary practice with on-campus diversity and inclusion challenges, which often led to the creation of classes to address the issue, but without thorough follow through.

In the new millennium, retention scholarship focuses on holistic approaches and “stresses cross-departmental institutional responsibility for retention via wide-range programming” (Demetriou & Schmitz-Sciborski, 2011, p. 4). In updated research published in 2016, Tinto argued three integral components as central to a student’s motivation: self-efficacy, a sense of belonging, and perceived value of the curriculum. Simply, students need to believe in their ability to succeed within the context of the current situation, they must have a sense of belonging in the environment, and they must believe that the material they are learning is of sufficient quality that it warrants their time and attention. While Tinto’s research has been instrumental in evaluating the
intrinsic factors that contribute to persistence (Tinto, 1993; 1999; 2016), a shifting
cultural narrative has also helped modernize the attrition discussion, which has shaped
the modern narrative on attrition.

Today, many higher education practitioners have reevaluated their perceptions of
student attrition, evolving from a former belief that institutions could fail as many
students as they wanted because there was an endless supply of new students, according
to Drew Koch, president of the John N. Gardner Institute for Excellence in
Undergraduate Education (Field, 2018). In fact, colleges and universities often used the
number of students failing out as a symbol of institutional prestige, a dialogue that has
shifted due to economic and political pressure. The public and lawmakers alike no longer
accept high attrition rates, perhaps after recognizing that it is cheaper to help students
persist than to replace them (Field, 2018).

*The history: Research on retention.*

Extensive retention scholarship dating back to the 1930s exists and provides a
sociological timeline of the various challenges causing students to depart. However,
much of this research has failed to thoroughly evaluate the severity of the problem. Prior
to 2016, only first-time, full-time cohort members were considered for retention statistics,
effectively excluding part-time students, transfer students, and returning students
(Henderson & Powers, 2017). For this reason, years of institutional data on attrition
statistics is often skewed on the actual severity of the problem. By only evaluating first-
time, full-time students, previous research effectively ignored 51.2% of students entering
college between 2004 and 2013, or approximately 24,500,000 students (Henderson &
In practice, higher education retention remains a critical issue, and a student’s likelihood to persist is affected by a complicated set of interpersonal, academic, social, institutional, and financial factors (Jobe et al., 2016). Concerns regarding increasing attrition now originate from the federal government, state governments, accrediting organizations, students, parents, and the public, especially since the cost of college has increased so astronomically in recent years, calling into question the actual value of higher education (Cassidy, 2015; Craig, 2015; Hornak, Farrell, & Jackson, 2010). However, the increased focus by institutions to improve retention rates has failed to statistically decrease student attrition (Tinto, 1993; Tinto 2016). In fact, retention rates have stagnated, and nationwide, just 61% of students who started college in the fall 2015 semester returned to that same institution in 2016.

While retention rates vary significantly by institution and student type, it is important to note that measuring retention has become increasingly complex. Historically, retention has been a dichotomous concept: either students persisted or dropped out, but newer research has emphasized that students take many different paths from initial matriculation to completion, including transferring, reverse transferring, and swirling, where students move through a series of institutions. In such cases, a student may not graduate from their first institution, but it does not guarantee that he or she did not graduate from another, making measuring actual attrition even more difficult (Campbell & Mislevy, 2013).

The Free Application for Federal Student Aid (FAFSA), which is used to determine federal aid eligibility, is the first step in a long application process for many students. By itself, the FAFSA is so detailed that 10% of students who would be eligible
for need-based aid fail to file (Bird & Castleman, 2015). When approaching their second year, one in six college freshmen who received a Pell Grant and are in good academic standing fail to renew the FAFSA (Bird & Castleman, 2015; Castleman, Meyer, Sullivan, Hartog, & Miller, 2017), and 15 to 20% of Pell Grant recipients fail to refile, regardless of academic standing (Bird & Castleman, 2015). For students who do not refile, Castleman and Page (2014b) suggest the loss of financial aid may contribute to increased attrition between the first and second year of college.

Research from the 2007-2008 National Postsecondary Aid Study, which surveyed students on the financial aid application and verification process, found that almost 61% of respondents who failed to complete the FAFSA believed they were ineligible, 23% had no information on how to apply, and nearly 19% said the forms were too much work (Davidson, 2015). A Community College Survey of Student Engagement conducted in the same year found that 39% of full-time respondents thought they would be ineligible for aid, while another six percent said the form was too hard to complete. From community colleges to four-year institutions, affordability, and by default, receiving financial aid, is one of the most-cited reasons why students start college but never graduate (Bettinger, 2012).

Research published by Mark Kantrowitz (2011) detailed the findings of the 2007-08 National Postsecondary Student Aid Study (NPSAS), a survey conducted every four years by the U.S. Department of Education’s National Center for Education Statistics. This study surveyed 114,000 undergraduate students and 14,000 graduate students, and found that, of the students who did not apply for any financial aid regardless of source, 95.3% gave at least one of five reasons for not applying. His research found that 60.7%
believed they were ineligible, 50.6% had no financial need, 40.2% did not want to borrow to pay for college, 22.9% had no information on how to apply, and 18.9% said the forms were too much work. According to Kantrowitz (2011), the first three reasons accounted for 92.2% of the non-applicants. His research further found that about one-third of these students would have qualified for a Pell Grant, among other aid (Kantrowitz, 2011).

Recognizing that the complexity of the application is a deterrent to completing the FAFSA, the federal government has attempted to simplify the form in recent years. To meet this goal, the Department of Education enacted changes to overhaul the online application, removing questions via federal legislation, and allowing applicants to answer the remaining financial questions with tax data via the Internal Revenue Service website’s data retrieval tool. Additionally, opening the annual application three months’ earlier and allowing applicants to use prior-prior year tax documents has helped students submit their FAFSA early, which has increased applications from high school seniors by nine percent (Kreighbaum, 2017). While this overhaul eliminated 250 million questions annually, shortening the form has not completely alleviated the FAFSA frustrations, as a still-challenging form leads to countless incorrect or incomplete applications (Davidson, 2015). It is also helpful to note that a completed FAFSA does not automatically correlate to a financial aid award, since a large portion of the student population are selected for a financial aid verification process, an added challenge for many first-generation, minority, and low-socioeconomic students.

Student Retention and the Connection to Financial Aid

In the past, funding a college education was a fiscal responsibility typically shouldered by the family; however, beginning in the 1990s, increases in tuition and fees
began outpacing the median family income and inflation. In the late 1980s, students at public four-year institutions paid an average of $3,190 for tuition, adjusted to 2017 dollars. In the 2017-2018 year, the average was $9,970, an increase of 213% (Martin, 2017). In 1990, just 54% of full-time dependent college students received some type of financial aid, while in 2004-2005, 76% of first-time, full-time undergraduates attending a four-year institution received some aid. Additionally, from 1997 to 2017, average tuition and fees at public national institutions rose 194%, and increased 157% at private national universities (Boyington, 2017). For institutions, these increased costs may deter continued enrollment as current students may elect not to return due to higher costs, which correlates to a loss of revenue for the college or university (Mulhern, Spies, Staiger, & Wu, 2015).

Although it is difficult to precisely quantify the cost of student attrition on the respective institution due to differences in tuition rates, amount spent on instruction, and other varying factors, Johnson (2012) analyzed survey data from a Beginning Postsecondary Students Longitudinal Study spanning from 2004 to 2009. Johnson (2012) found the average estimated expenditure per completed degree was $43,000, while the average expenditure per incomplete degree was $18,000. Thus, for every student who does not graduate, an institution spends the equivalent of 40% of the amount they spent on another student who did graduate, a significant cost to the institution, especially when factoring in the diminished revenue post-attrition. Since Castleman and Page (2014b) indicate financial aid loss as a contributing factor to increased attrition between the first and second year, and Johnson (2012) indicates that taxpayers spend more than $9 billion
each year educating students who fail to return, there are certainly shortfalls in the current structure.

Despite notions that a lack of financial aid can increase student attrition, the reality is far more complex. This problem is more multifaceted than simply receiving aid and persisting or not receiving aid and departing, accessing and completing the steps to receive aid remain problematic for many students (Bettinger, 2004; Demetriou & Schmitz-Sciborski, 2011; Hossler, Ziskin, Gross, Kim, & Cekic, 2009; Perna et al., 2011; Scott-Clayton, 2015).

One of the most discussed – and least resolved – challenges impacting higher education is not only the access to financial aid, but access to resources and assistance pertaining to the financial aid application process. Efforts documenting the lack of information about financial aid date back to the 1980s, as early research found that misinformation about financial aid among parents and students was abundant, often from a lack of access to information (Castleman, 2013; Long, 2008). Research shows that students and families from disadvantaged backgrounds are typically unaware of, or even overestimate, the actual cost of college tuition (Castleman, 2013). Even today, after selecting their institution, incoming students are immediately tasked with the daunting responsibility of applying for financial aid, which may lead to stress associated with financial uncertainty. After students navigate the process of applying for financial aid, they often struggle with comprehending their award notice, assuming they complete the process correctly and are awarded aid (Hornak, Farrell, & Jackson, 2010). According to Selingo (2018c), “[d]eciphering financial aid letters is almost impossible. Each [college] uses different formats, difficult-to-understand abbreviations or mixes together loans and
grants, blurring the lines between the two and creating confusion” (p. 42). For students and parents lacking institutional knowledge, the terminology can create frustration and increase a students’ desire to enroll elsewhere – or nowhere (Arnold, Fleming, DeAnda, Castleman, & Wartman, 2009; Schneider 2015).

The federal financial aid process is undoubtedly a significant source of frustration for prospective students and their families, especially during the summer between high school and college. As the United States slips among the global ranks of nations with a formally educated populace, there has been a collective societal, governmental, and sectoral push to recruit and retain students, a challenge often exacerbated by an overly complex financial aid application process (Campbell & Mislevy, 2013; Vedantam, et al., 2018).

Verification Navigation and the Cost of Incompletion

Even if a student completes the financial aid application properly and prior to the deadline, there are additional hurdles he or she may face prior to matriculation, most notably, the federal financial aid verification process (Krupnick, 2016; Levi, 2017). An enterprise that has yet to be simplified by Congress, verification is a process where, using unpublished risk models, the Department of Education selects approximately 30 to 40% of all college students to complete an additional process, which requires the respective institution to verify the information reported on the FAFSA (Davidson, 2015). The process, called “bloated, burdensome, and costly to institutions and the federal government, [while providing] questionable results” costs an institution approximately $90 per student, or $432 million per year nationwide. Since this process is handled institutionally, colleges and universities can create their own forms, as long as they align
with federal policies. This creates a lack of interchangeability among forms, as a prospective student will complete the same process at each institution using different paperwork (Davidson, 2015).

The cost to the institutions, while excessive, may dwarf in comparison to the cost to the students, as Davidson’s research (2015) found that the verification process, which holds up the disbursement of any federal aid, negatively impacts persistence. The same study found that 62% of respondents thought the FAFSA process was complete once the form was submitted. Since students are not immediately notified that they have been selected, they must wait to be notified by their college or university, delaying receipt of federal financial aid, including the Pell Grant and student loans (Davidson, 2015).

To prevent award delays and encourage early completion, the Obama Administration announced that, beginning in October 2016 for the 2017-2018 aid year, the FAFSA would be available earlier, so students and families could complete the form in October, rather than waiting until January. Additionally, the FAFSA now uses tax information from two years ago, known as prior-prior year, which means that applicants will not have to wait until their taxes are filed to apply for aid (Hexter, 2015). While this change allowed earlier application, it also triggered an increase in verification flags, a ponderous responsibility for students and families (Murphy, 2017).

While the intent of verification is to reduce fraud and ensure students are qualified to receive certain types of aid, the process is often cumbersome and difficult to navigate, especially for those students most likely to need aid and least likely to have access to assistance – first-generation and minority students (Castleman, 2013). This onerous process is often invasive to students, a challenge even more unmanageable for first-
generation students or those without guidance or resources. According to Goldrick-Rab (2016), financial aid officers often collect documentation on very sensitive issues, including medical records and death certificates, and they are tasked with discussing extremely personal matters, topics that some students may find so uncomfortable they would rather forgo financial aid.

For financial aid administrators, these experiences are common, and assisting students navigating the verification process is especially daunting when a majority of institutional financial aid offices have had their budgets reduced in the last decade. According to the National Association of Student Financial Aid Administrators (NASFAA) 2010 report, 62% of financial aid offices experienced funding cuts in the previous year, and of those, 22% were cut by more than 11%. While 30% reported no change in their funding levels, just 5% reported a funding increase. To counteract these cuts, financial aid offices have strategized to cut costs through reducing staff travel (61%), reducing office and supply expenses (56%), forgoing salary increases (51%), implementing hiring freezes (33%), and reducing staff training (32%), while also deferring projects, reducing office hours, and increasing automation of processes and communications (NASFAA, 2010).

According to Goldrick-Rab (2016), a 2015 national survey of financial aid administrators found that schools with more than 20,000 students had an average of just 12 financial aid administrators, making each staff member responsible for more than a thousand students. With so many students assigned to each staff member, Goldrick-Rab (2016) notes the opportunity to provide individual support is lacking, citing an administrator who claimed “[w]e’re at a point when the automation in the system has
done what it can do and then the rest has to be done on a one-on-one, personal basis. But that’s very difficult for [the students] to understand” (p. 62). Without personalized attention from the financial aid staff, the number of students who must navigate the verification process alone is staggering, and many of them also lack familial assistance as first-generation or low-income students.

In 2014-2015, 98% of students selected for verification, or 5.2 million students, were eligible for a Pell Grant, which means that an overwhelming number of students selected for verification are from low-income families (DeBaun, 2017; Hoover, 2017). In 2016, The Institute for College Access & Success distributed a survey to 2,700 members of NASFAA, the National Association of Student Financial Aid Administrators, receiving 617 responses, a 23% response rate. Of the 617 responses, more than 50% of respondents said verification “almost always, often, or sometimes results in students being unable to enroll on time” and 71% agreed that “verification places unnecessary burdens on low-income students and families” (p. 15). The research also found that 56% of respondents believed verification prevented eligible students from receiving the aid they need.

According to Hoover (2017), of the seven million students selected for verification in 2014, a third saw no difference in their award package while another third never submitted the documents, thereby excluding themselves from receiving federal financial aid. Similarly, research conducted by Vanderbilt University found that 48% of applicants completing verification at one four-year public university found no change to their expected family contribution, which determines Pell Grant eligibility (Mulhere, 2017). These findings were mirrored by a report published by The Institute for College
Access & Success in 2016, which surveyed financial aid administrators and found that only 10% reported that the verification process significantly changes a student’s aid package.

Research conducted by Hoover (2017) also found that, in the 2016-2017 aid year, approximately 76,000 Houston Community College students filed a FAFSA, and of those, about 37,000 were selected for verification. Of those selected, half failed to complete the process, and only 2,700 of those students attended without financial aid. The data from Houston Community College is not an isolated occurrence, rather, millions of students fail to complete the FAFSA and the verification process, leaving more than $2.7 billion in federal gift aid unclaimed in 2014 (Ross, 2015; Simons & Helhoski, 2016).

In fact, the complexity of the verification process has led to an influx in ‘verification melt,’ which afflicts one in five low-income students who never complete the arduous process, according to the National College Access Network (NCAN) (Draeger, 2018).

Verification melt may continue to be a problem for student services personnel and low-income students, as the number of students with an Expected Family Contribution (EFC) of zero increased at several schools from 2017 to 2018 (Smith, 2018). NCAN’s research also examined enrollment differences when juxtaposing Pell Grant qualified students selected for verification with Pell Grant students who were not selected for verification. According to the findings, 78% of students who were Pell Grant eligible and not selected for verification received the grant, compared to 56% who were selected for verification. This represents a 22-point verification melt gap, and students who fail to complete the process leave aid unclaimed (Mulhere, 2017). Nationwide, this is nearly 100,000 students
who started the financial aid process but quit due to verification challenges (Smith, 2018).

Some of this unclaimed aid would have benefitted the estimated 1.4 million eligible high school graduates who did not submit the application. Per student, this correlates to an average of $1,861, with the most unclaimed funds in Washington, D.C., at $2,513, and Mississippi, at $2,639 (Simons & Helhoski, 2016). When factoring in non-gift aid, like student loans, the unclaimed annual amount swells to more than $24 billion, which is often attributed to the complex nature of the FAFSA application (Ashford, 2017).

If a student submits the FAFSA and completes the verification process accurately, he or she may face additional challenges once the application is received and processed by their selected institution, stemming from the financial aid offer letter. A 2018 joint report from the think tank New America and the college affordability advocacy organization uAspire reviewed more than 11,000 offer letters from the class of 2016 and discovered several inconsistencies from letter to letter. The researchers collected letters from students at 194 high schools and conducted a quantitative analysis on the terminology. According to the findings, in examples where 455 colleges offered unsubsidized loans, 136 different terms were used to identify this type of award, and 24 institutions did not use the word loan at all (Jones, 2018). Around half of the letters failed to explain to students how to accept or decline the award and 40% failed to inform students of the amount they would have to pay after their aid (Harris, 2018; Jones, 2018). The report also found that 23 different funding formulas were used and 36% of institutions included no cost information, and these differences often meant that an
institution appearing less expensive may cost more (Lobosco, 2018). Since financial aid award letters are often mailed and received during the summer, students are often left with questions about their aid, how much they will owe after aid, and how to apply for supplemental loan funding. This burden is compounded when students receive their tuition bill, as they are often surprised by unexpected charges, like health insurance and student fees. Students may be unaware of payment options offered by their institution and may even be confused as to whether their bill is for one semester or the entire academic year (Castleman & Page, 2017).

Such a complex process becomes even more daunting when students have completed high school but have yet to become part of their college community (Dalton, 2018). One transition counselor said the disconnect is caused by students who do not know what to do when challenges arise, feeling as though they have completed high school, but not yet started college. Students often experience a fear of the unknown, as they are often unsure who to ask for help. Oftentimes, when experiencing this confusion, they elect not to ask anyone and potentially do not matriculate (Castleman & Page, 2017; Duncan & Murnane, 2014).

Summer Melt

In enrollment management, recruiting and retaining students are critical endeavors; however, a new challenge for enrollment management leadership has become prevalent in recent years. Summer melt, the occurrence of college-intending students who fail to matriculate, has transformed from an expected afterthought of most enrollment management professionals into a significant decrease in potential revenue for institutions due to less-than-expected tuition generation (Arnold, Chewning, Castleman, Page, 2015;
Nationwide, summer melt hovers between 10 and 20%, and while admissions officers often plan for some summer melt, it can ultimately be costly for institutions without waitlists to draw from which can drastically impact their financial bottom line (Daulerio & Serna, 2017; Gehlbach & Page, 2018).

With the loss of potential revenue, many institutions have sought to reduce melt, and emerging literature has begun to investigate this phenomenon (Arnold et al., 2009). In addition to the immediate financial loss to the institution, there are negative long-term effects to the students who melt, as research indicates those who delay their enrollment are far less likely to earn a college degree. Failing to earn a post-secondary degree leads to more financial and economic instability over time (Lowe, 2018).

Modern research on summer melt stems from a study conducted by Karen Arnold in 2006, which focused on alternative schools in Rhode Island. Arnold researched students’ actual college enrollment compared to their previously stated plans and found that nearly one-third of students with plans to enroll in the fall failed to matriculate. Arnold conducted interviews and small focus groups with 13 students. Of this group, all had been accepted and paid financial deposits, but only six matriculated at their selected institution, while three switched to another four-year institution, one switched to a community college, and two did not enroll at any institution. Most of these students were first-generation college students, and through the interviews, Arnold discovered that several relied heavily on school staff during the academic year. During the summer, when fewer advisors were available, students reported feeling the impending strain. Castleman and Page (2017) wrote about Arnold’s (2006) research, and noted students struggled to
choose between furthering their education and the allure of staying at home. Students who are employed at home and contribute financially to their family or who have a significant other at home may struggle to decide to leave. In turn, some students report being pressured by family members to forgo college who questioned whether college was worth the investment or expressed concern about the student moving away from home (Arnold et al., 2009).

This pressure, combined with looming financial concerns, often led students to change or abandon their academic plans. In addition to the aforementioned concerns, one theme that emerged from Arnold’s (2006) research was the students’ lack of knowledge of the tasks, requirements, and steps associated with completing the admissions process. In her research, Arnold found that students who had not received a financial aid offer during the summer often assumed the institution was still working on it and would reach out to them, a direct diversion from high school, where students were guided through the process (Arnold et al., 2009; Castleman & Page, 2017). Without the directed support students become acclimated to during high school, they are often unable to navigate the higher education red tape between application and enrollment (Long & Riley, 2007).

Although students melt for several reasons, research has found that the summer after high school is a period of disconnect between the student and their prospective college or university (Castleman & Page, 2017). This occurs at a time when students and parents alike are tasked with making significant financial decisions, and Castleman and Page (2017) posit the stress associated with these decisions has increased in recent years as college costs have risen, and the value of higher education remains under scrutiny (Bennett & Wilezol, 2013; Belkin, 2017; Washburn, 2005). For a point of reference, the
average tuition at four-year public institutions in the 1987-1988 academic year was $3,190, adjusted to 2017 dollars. Average tuition jumped to $9,970 for the 2017-2018 academic year, a 213% increase in 30 years. At four-year private nonprofit institutions, the average tuition was $15,160 in 1987-1988, compared to $34,740 in 2017-2018, with both amounts adjusted to reflect 2017 dollars (Martin, 2017).

According to Castleman, Page, and Schooley (2014), summer melt occurs after students have selected their institution, when matriculation is contingent upon completing a series of tasks during the summer, a time when the student no longer has access to a high school counselor and has yet to access the resources of their chosen college or university. Castleman and Page (2013a) write that college admission is followed by a complicated series of tasks required for matriculation. During the summer, students must receive and interpret their financial aid offer and the cost of attendance, establish a plan to apply for funding or how to pay for the difference, register for and attend orientation, register for and complete academic placement tests, and register for student housing. A lack of easily accessible assistance from their future institution may challenge incoming students, who become frustrated by the lack of clear and concise information, especially if the student does not proactively seek out information (Bawab, 2017).

For students from economically-disadvantaged backgrounds, these tasks are arduous, since many lack access to the professional support offered by their future institution and find themselves without the financial resources to pay for private college counseling (Castleman & Page, 2013a; Castleman, Page, & Snowdon, 2013; Page, Castleman, & Sahadewo, 2016). In fact, the concern over finances is a significant contributor to summer melt. Castleman and Page (2017) write that many students
struggle to find funding that will cover the gap between the full cost of attendance and their financial aid offer. Students are tasked with understanding complicated financial aid forms and letters, loan applications, tuition bills, and payment plan choices, paperwork that even college-educated parents find challenging. Without a support system that is knowledgeable about the college admissions process, uncertainty surrounding financial aid and looming concerns of impending student loan debt often leaves students overwhelmed, which may lead them to melt (Bawab, 2017).

During the summer, many students’ college plans often disintegrate due to a lack of support, which is exacerbated by higher education bureaucracy and the complex financial aid application process (Addo, 2015; Dynarski, 2015; Woodruff, 2014). Institutions of higher learning often “produce bureaucratic hurdles, then ask students to assume good faith and a willingness to help on the part of professors and administrators who don’t always exhibit such openness,” which can correlate to a marked difference between the level of informational access between low socioeconomic status students and their more financially affluent peers (Johnson, 2016).

Castleman and Page (2017) suggest that students without the experience to navigate the college admissions process are often hesitant to contact their college for assistance. They posit that students are afraid to give the impression that they aren’t prepared for college if they ask for assistance, and, if they do contact an admissions or financial aid counselor, they may initially receive a negative response, and not know how to navigate the system or probe with additional questions. Again, these challenges are especially pronounced for first-generation or lower-income students, who lack a familial support system to assist them in navigating the admissions process, limited by lack of
knowledge of the application process and types and sources of aid (Brint & Clotfelter, 2016; Castleman & Page, 2017).

**Demographics of summer melt.**

In the United States, a child born into a low-income family has a 9% chance of earning a college degree, compared to a 54% chance for a child born into a high-income family (Bettinger, 2015; Dynarski, 2015). Research conducted at the University of Michigan’s Inequality Lab found that families with a net worth in the lowest 40% of U.S. households account for just less than 12% of new college graduates, a statistic that has remained stagnant since the 1990s. Alternatively, students from families with a net worth in the top 20% account for 60% of new college graduates, a number that has increased 15% during that same timeframe (Bohanon, 2018). Oftentimes, the disparate gaps in educational attainment mirror the support system; therefore, summer melt is more often experienced by lower-income students, community college students, and those who are less academically prepared for college (Bawab, 2017; Greene & Vedantam, 2013; Pratt-Kielley, 2017). This aligns with statistics on summer melt, which, while afflicting approximately 20% of students nationwide, grows to nearly 40% at community colleges, institutions that often serve lower-income, first-generation, and less academically prepared students (Castleman & Page, 2013b; Greene & Vedantam, 2013; Shafer, 2017; Supiano, 2018a). However, even students bound for elite universities experience summer melt, where the rate hovers around 10%, proving that the phenomenon is not solely experienced by less academically-prepared students, those from lower socioeconomic levels (Arnold et al., 2015; Bawab, 2017; Vedantam, 2017).
The psychological effects of summer melt. In their research, Castleman and Page (2013a) attempted to identify potential causes of summer melt, expanding beyond the main argument of lack of access to resources as the predominant cause of melt. The authors suggest that the psychological transition from adolescence to adulthood, which coincides with the completion of high school, is a contributing factor to student melt. Since students and their parents are often overwhelmed by the number of processes to be completed and the number of decisions to be made, students may experience an academic and social disconnect with the dimensions of college life. Students may become hesitant to transition to a new physical and social location, and this uncertainty may lead students to accept to remain in their current environment, where they find stability.

Tinto (1993) notes that this separation process, which forces students to remove themselves from their normative social and familial lifestyle and inject themselves into a new community, creates a dichotomous internal struggle, where students feel no strong bond to their past or future. Subsequently, “[t]he process of renegotiating social support networks, redefining existing relationships with family and friends at home and establishing new friendships is crucial for a successful transition to university, and students who fail to make friends are likely to withdraw” (Harley, Winn, Pemberton, & Wilcox, 2007, p. 230). For students that struggle to have a solid transition from high school to college, especially during their initial semester, there is an increased likelihood that the student will not continue at that institution after that first year (Stewart, Lim, & Kim, 2015). This transitional period is compounded for first-generation students, who may feel less prepared for college (Wohlgemuth et al., 2007).

Predictive analytic data.
Predictive analytics, despite having been in existence for decades, have only become mainstream in recent years. Predictive analytics use Big Data and business intelligence to predict future outcomes by combining complex predictive algorithms with historical data to calculate the likelihood or probability an event will occur (Huang, McIntosh, Sobolevsky, & Hung, 2017; Marvin, 2016). Using complex algorithms, which are rules that order the sequence of an operation, predictive analytics power operating systems so users, by following the same steps, can expect the same results each time (Desouza & Smith, 2016). For example, predictive analytics power Facebook, to optimize what content appears on a newsfeed, a technology that is now being incorporated in higher education.

Colleges and universities now have systems that notify advisers when students are at risk of failing a course, recommend majors to students based on their academic performance, and analyze collective student performance on assignments to improve pedagogical results (“How predictive analytics,” 2018). Within higher education, institutions also use predictive analytics to allocate resources to recruit the students most likely to enroll, based on student demographics, performance, and geographical data. Predictive analytics can be coupled with artificial intelligence, or AI, to help improve communication in higher education.

The Proposal: Implementation of Artificial Intelligence

Artificial Intelligence (AI) is defined as the process that occurs when a computer system can think and act rationally, and by mimicking cognitive functions, it is a technology that is permeating the modern world (Daulerio & Serna, 2017; Russell & Norvig, 2009). AI assists people with everything from ordering pizza to handling
customer service inquiries, to seeking out information on their smartphone or home-based
AI devices via Apple Siri, Amazon Alexa, Google Now, or Microsoft Cortana (Bogardus Cortez, 2018; Brandtzaeg & Folstad, 2017; Putz, 2017; Serban et al., 2017). These
conversational chatbots, which use natural language processing (NLP), have the potential
to help improve support via technological communication, since NLP, which connects
multiple patterns to a single response, can provide timely instructional assistance
(Gregori, 2017). NLP helps chatbots avoid strict command forms, which enables users to
interact with the bot in a conversational way, much like a student would communicate
with a friend, classmate, or professor (Dickson, 2018). This means that chatbots collect
multiple data points from the user in a logical progression, then changes responses
intelligently. This immediate parsing of the data helps the chatbot improve its
understanding of the person’s intent. This process, known as machine learning, allows a
chatbot to evolve in response to previous conversations, which means it gets smarter with
every engagement (Daulerio & Serna, 2017). While modern artificial intelligence has
become very savvy, and has even successfully beaten the Turing Test, analyzing and
understanding the history of the technology is essential to understanding its efficacy.

In the 1950s, Alan Turing, a British mathematician who helped crack
governmental codes during World War II, hypothesized that a machine could be designed
to show intelligent behavior that was indistinguishable from human behavior
(Shyamasundar, 2014). The purpose of his research was determining the threshold at
which a machine or computer possesses thoughts equivalent to a human, and developing
a way to measure this phenomenon (Shieber, 2011). Turing developed the Turing Test,
which is now routinely used to see if a human interrogator can correctly distinguish
between the two. Turing hypothesized that if the machine could successfully fool the human interrogator, the machine should be considered intelligent (Dormehl, 2017; Love, 2014; Popenici & Kerr, 2017).

While Turing worked on artificial intelligence, chatbots, which use AI to navigate information and provide a response, were first developed in 1966 by Joseph Weizenbaum in his project, ELIZA, which was initially designed to imitate responses of psychotherapists during therapy sessions (Brandtzaeg & Folstad, 2017; Dormehl, 2017; Serban et al., 2017). Using pattern matching and pre-written scripts derived from user responses, the chatbot concept was later expanded by Dr. Richard S. Wallace in 1995 with A.L.I.C.E, which used Artificial Intelligence Markup Language (AIML) to pattern match, but with far shorter responses than ELIZA. Wallace was also successful in using AIML to combine responses from many categories, creating a more conversational approach that is still used in modern chatbots (Kane, 2016).

Despite the advancements in the technology, it was not until 2014 that the Turing Test was finally won by the machine, proving that chatbots could respond as a human would (Hern, 2014; Savin-Baden, Tombs & Bhakta, 2015). If one can interact with a machine that provides answers so effectively the human could not distinguish it, there is an argument that the use of this technology could be used to assist humans.

Artificial Intelligence and Messaging in Higher Education

Colleges and universities are often overburdened with student inquiries 24 hours per day, leading to an overworked staff. The strain on staff may be alleviated by implementing a system that replies in real-time; a system that can handle both general and personalized inquiries on-demand, all in a conversational-style exchange designed to
increase student comfort and satisfaction (Gregori, 2017). According to Craig (2018), 20% of every tuition dollar is spent on instruction, which means approximately 80% is spent elsewhere, often on repetitive processes that AI could automate.

According to the Delta Cost Project, between 2000 and 2010, large research universities increased student services spending by 19%, while spending on administration increased 15%, and instruction spending increased just 10%, showing the discrepancies from student services versus instruction spending (Ford, 2015). If some aspects of student services were automated via artificial intelligence, some of these financial resources could be refocused to improve learning, instruction, and other academic initiatives.

One of the early studies that paved the way for arguments in support of implementing artificial intelligence in higher education was a 2012 study conducted by Castleman and Page (2013a), who utilized a randomized trial to investigate the efficiency of a series of text message prompts to increase college enrollment for low-income high school students. Referred to as nudges, these messages reminded students to complete standard matriculation tasks, like registering for orientation, as well as offering insight and guidance on comprehending financial aid offer letters. This study, which cost approximately $7 per student and customized the messages to each recipient, was completed in three urban school districts in Massachusetts: Boston, Lawrence, and Springfield. Using random assignment, 387 students received the messages and 384 did not; the findings indicated that approximately 35% of the students in the test group responded to at least one message, and one in five received detailed support from an advisor. The initial published findings, which did not attempt to correlate a
communication-based intervention to increased matriculation, sought to show that text messaging is a viable communicative approach and can aid in connecting students with professional guidance and support (Castleman & Page, 2013a).

A later publication indicated that students who received message-based support at two of the locations, Lawrence and Springfield, were more than seven percentage points more likely to enroll in college, although there was no indication of a benefit in Boston (Castleman & Page, 2014a). The authors chose to use text messaging, as they had previously identified it as the predominant communication method used by young people, finding that 63% sent daily text messages, while 39% spoke verbally on the phone, and 6% sent emails (2014a).

A similar study was conducted in the United Kingdom, where students received text message prompts reminding them of key educational information. Based on previous research that found students welcomed text message reminders as long as they were personalized and were not spam-like, this research disbursed prompts and emails to students at the University of Birmingham. After the study concluded, seven of nine participants said they would subscribe to the service if offered, while a majority also noted that, despite receiving the same information via email, they noticed the text message first, which reinforces perceptions that modern students have the potential to engage more with text messages than with email (Naismith, 2007).

Additionally, within higher education, mobile phones are a communication platform that require little technical or financial support from the institution, since most students already have the necessary software and hardware, and the communications themselves occur via existing mobile networks, which are maintained by external
Research that emphasizes the widespread use and preference for text messaging communications amongst Generation Z helps support the concept of chatbots, which can disburse messages automatically. If the preference for current students are text-based communications, which can be automatically sent via chatbot, the institution can then nudge students to complete tasks via reminders in the palms of their hands (Page & Castleman, 2017; Selingo, 2018b; Sulleyman, 2017).

It’s All About the Nudge: How Prodding Makes a Difference

Nudging, a behavioral science technique, is a prompt to change an individual’s behavior in the pursuit of a specific objective, without removing any other option (Benartzi, et al., 2017; Schwartz, 2019). Thaler and Sunstein (2008) define a nudge as any aspect of the choice architecture that alters people’s behavior in a predictable way without banning any options or altering economic incentives. Nudging, which can be simplified as the social science of choice (Benartzi et al., 2017), is an intervention that alters behaviors in a positive, predictable, and non-forceful way (Wesley, 2018), using ‘choice architecture’ to present options differently (Desouza & Smith, 2016). Choice architecture “doesn’t look for individuals to act more rationally; instead, it seeks to create environments that accord with rational decision-making” (Desouza & Smith, 2016, p. 12). Nudging is usually used to help modify behaviors in expected ways, without forceful coercion, for example, billboards on the perils of drinking and driving, to help guide individuals to make better decisions (Desouza & Smith, 2016).

Nudges in higher education.
As a practice, nudging has been tested via basic, one-way text message reminders. Using uAspire, Page and Castleman (2017) completed a study that sent 12 messages to current first-year students, prompting them with reminders about completing the FAFSA. Among the population that received the text message prompts, 68% went on to complete their second year, 14 percentage points higher than the population that did not receive the text messages. Additionally, 86% of students who received the texts reported the messages prompted them to complete a task they had not yet done, and 85% reported that the texts reminded them of a step they were unaware they needed to complete (Ruhlmann, 2016). While one-way text messaging has shown its value in higher education, the option to engage with a system via a two-way device becomes an even more viable option for practitioners.

Belkin (2017) suggests using nudges that provide access to resources that help students address perceived unsolvable problems, often with easy fixes. Using nudges also helps mitigate potential delays that incoming students create simply through delaying completion of tasks. According to Castleman and Page (2017) the impulsiveness of teenagers and their desire for instant gratification means giving them the opportunity to complete tasks with a few simple clicks could greatly assist Generation Z. In the digital era, many of these nudges have become text messages, but the increasing workload this puts on shrinking student services staffs may cause burnout, making the automation of such processes, via chatbots, a viable option (Goldrick-Rab, 2016; Wesley, 2018).

This argument is seconded by Castleman and Page (2017), who claim that summer melt occurs during a “nudge-free” timeframe in a student’s educational career. While students benefit from structured and controlled high school classrooms, where they
receive academic nudges, the summer is often a time of diminished outreach (Castleman & Page, 2017; Howe & Cook, 2014). During the summer, the nature of the required tasks is less academic and more administrative. Without reminders, students may miss deadlines, or, if they face additional hurdles, find themselves without sufficient time to complete them, not because they lack motivation, but because they lack support during this transitional period (Castleman & Page, 2017).

By automating processes, institutions can reap the benefits of nudging without placing excessive amounts of work on their student services staff (Castleman & Page, 2014b; Castleman & Page, 2017). In fact, Castleman and Page (2017) emphasize that the purpose of the nudge – and the chatbot – is not to help students overcome significant hurdles, but to aid with small problems. Nudges can help resolve these issues, per Vedantam et al., 2018, who suggest

[t]he reason kids drop off in the summer between high school and college is not because of any one big problem. It’s a hundred little obstacles, like pebbles in your shoe. A financial aid form that requires a parent’s signature. Easy enough, unless you have a parent who is sick or absent. A document asking students to make a decision about financial aid. Easy enough, if you have parents or a guidance counselor who can help. An important deadline, not hard to make, unless you find yourself in a rural area without a car.

Generation Z: The Population and the Challenges

Colleges and universities, in their current structure, are designed for previous generations and often fail to meet the needs of Generation Z, which currently encompasses the traditional 18- to 24-year-old college age population (Seemiller &
Grace, 2017). Selingo (2018b) notes that the arrival of this technology-dependent generation on campus coincides with increased institutional attention on the retention of students and reduction of academic achievement gaps, which has forced administrators to reevaluate their current communication and outreach strategies. While the last college-going generation, the Millennials, received much of their college information via email, Generation Z has nearly abandoned its use, as research found that only 20% of emails sent to Generation Z are opened, a staggeringly low number when considering that 98% of text messages sent to Generation Z are opened within 15 minutes (Daulerio & Serna, 2017).

Generation Z births started in 1995, the same year as the founding of the Internet. In addition to the newfound access to information, this population grew up in times of war, mass shootings, and terror attacks. Many in this generation were too young to remember the September 11, 2001 attack, and they came of age in periods of sharp economic constrictions, from the collapse of the housing market and automotive industry to high unemployment and wage stagnation. Despite the periods of economic and political unrest, Generation Z lived through social justice movements, like Black Lives Matter and #metoo, the legalization of gay marriage, and expansion of transgender rights, evidence of a society becoming more empathetic (Seemiller & Grace, 2017). Compared to the more optimistic Millennials, who were adolescents in a time of economic prosperity (Seemiller & Grace, 2019), the recession has made Generation Z more pragmatic in their expectations for themselves and their careers (Stillman & Stillman, 2017) (See Table 1 below). To fully know and comprehend the mindset of this generation, including their dispositions, interests, and preferences, allows higher
education professionals to be better equipped to provide services to these students, especially since most active faculty members are Baby Boomers or Generation X (Mohr & Mohr, 2017).

Table 1
Chronological Breakdown of Generations (Selingo, 2018b).

<table>
<thead>
<tr>
<th>Generation</th>
<th>Birth Range</th>
<th>Population</th>
<th>Racial composition</th>
<th>Key notes and higher education consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation Z</td>
<td>1995-2012</td>
<td>73.6 million</td>
<td>57% white, 27% Hispanic, 17% Black</td>
<td>Came of age in economic downturn, more concerned about value of education</td>
</tr>
<tr>
<td>Millennials</td>
<td>1980-1995</td>
<td>79.4 million</td>
<td>61% White, 23% Hispanic, 16% Black</td>
<td>Raised by helicopter parents, brought consumer mentality to higher education</td>
</tr>
<tr>
<td>Generation X</td>
<td>1965-1980</td>
<td>65.7 million</td>
<td>65% White, 20% Hispanic, 15% Black</td>
<td>The latchkey generation, colleges gave students more influence over campus life</td>
</tr>
<tr>
<td>Baby Boomers</td>
<td>1946-1965</td>
<td>75.5 million</td>
<td>76% White, 12% Hispanic, 13% Black</td>
<td>Arrival on campus led to greater tuition revenue, while protests were common</td>
</tr>
<tr>
<td>The Silent Generation</td>
<td>1928-1946</td>
<td>26.3 million</td>
<td>82% White, 8% Hispanic, 9% Black</td>
<td>Court decisions led to college integration and greater access for women</td>
</tr>
<tr>
<td>The Greatest Generation</td>
<td>1918-1928</td>
<td>3.7 million</td>
<td>84% White, 8% Hispanic, 9% Black</td>
<td>Defined college access as World War II veterans enrolled using GI Bill</td>
</tr>
</tbody>
</table>

Generation Z is not only comfortable with technology, they are proficient at accessing any information they desire within seconds, and they now expect it from all organizations (Mohr & Mohr, 2017; Seemiller & Grace, 2017; Selingo, 2018b; Stillman & Stillman, 2017). However, this plethora of information makes it hard for those in Generation Z to understand how to critically evaluate the information and check it for
accuracy, so they often put up blinders to information they deem is not relevant or timely (Daulerio & Serna, 2017; Mohr & Mohr, 2017). This generation has been able to find what they want, when they want it, but are markedly less able to decipher and organize the information meaningfully. Additionally, availability of information does not always mean that the right information is easily accessible (Cole & Marcum, 2015). Generation Z is accustomed to finding information within a few clicks and they are likely to reject websites that are difficult to navigate; therefore, they are the first that could use a chatbot, a portal that allows students to ask specific questions, tailored to their situation, and receive an immediate response without any human interaction (Daulerio & Serna, 2017).

*Generation Z: The population for chatbots.*

Chatbots are computer programs that leverage artificial intelligence and machine learning to complete tasks while mirroring human conversation, but without extensive human input or explicit human programming, which aims to reduce employee workload by delegating routine tasks to the chatbot (Bii & Too, 2016; Daulerio & Serna, 2017; Desouza & Krishnamurthy, 2017). These computer programs, which can be used to assist with a variety of tasks, are no different than messaging with a human; in fact, they are often more efficient and effective at answering inquiries (Putz, 2017). Since 68% of Generation Z identify messaging as their preferred form of communication, there is a societal shift away from phone calls, and even emails, where the delay dissuades those desiring an immediate response (Lindbeck & Fodrey, 2009; Putz, 2017). This is reinforced by research which shows that Generation Z sends 90% of unsolicited calls directly to voicemail (Daulerio & Serna, 2017), likely because 65% of Generation Z either ‘dislikes’ or ‘somewhat likes’ making phone calls, per research conducted by
Seemiller and Grace (2016). Even email has fallen out of favor with Generation Z, since around 80% of emails sent to this population are unopened (Daulerio & Serna, 2017), while research by Seemiller and Grace (2016) indicated half do not like using email.

Generation Z has seemingly also evolved beyond basic text messaging, as more than 80% of this generations’ mobile phone time is spent messaging via non-text message apps, like Snapchat (Dean, 2016; Stillman & Stillman, 2017; Sulleyman, 2017). This generation reportedly spends more than three hours per day on messaging apps, including chatbots (Chamberlain, 2017), which affords them ‘perpetual contact’ with their social networks (Harley et al., 2007).

Messaging platforms currently serve 90% of teens in the United States, and the top four messaging platforms – WhatsApp, Facebook Messenger, WeChat and Viber – have more registered users, higher user engagement, and higher retention than the top four social networks (Jobin, 2016). Even within social networking sites, chatbots are common, with Facebook using more than 11,000 chatbots to power Facebook Messenger (Dean, 2016).

Chatbots have varying ability levels based on the appropriate interface required and “can provide realistic answers so the user will think that the communication is taking place with another human. The implementation of such systems varies from keyword matching, string similarity or complex natural language processing techniques. More sophisticated chatbots could learn from the user input” (Polatidis, 2014, p. 12). If chatbots can power the preferred communication platforms of Generation Z, the current target population for colleges and universities, their use can expand beyond social media and entertainment and foray into education. In higher education, a successful
communication platform would handle individual needs and idiosyncrasies, while minimizing general outreach to all students (See Appendix B). When an institution sends reminders or prompts to students who have already completed a task, it risks alienating those students, reinforcing the need for targeted communication (Page & Gehlbach, 2018). Prospective students do not typically express interest in information not directly related to them; therefore, the balance between making a student feel welcomed and providing them the necessary information is a challenge admissions personnel face daily (Daulerio & Serna, 2017; Lindbeck & Fodrey, 2010).

Higher Education Implementation

Chatbots and AI have already been implemented at several colleges and universities, which rely on artificial intelligence to complete tasks ranging from making admissions decisions to generating admissions letters, which expedites and automates previously labor-intensive processes (Jepsen, 2016; Weiner, 2017). For institutions that automatically grant admission decisions based on test scores and grade point average, AI algorithms are already processing the information and generating admission letters (Weiner, 2017).

At Australia’s Deakin University, students have access to a virtual assistant named Genie, which incorporates voice recognition, chatbots, artificial intelligence, and a predictive analytics engine. Powered by IBM’s Watson, Genie was designed to help alleviate stress on employees, according to Deakin’s Vice Chancellor Jane den Hollander, which was exacerbated when Deakin expanded its online programs globally. den Hollander noted when “our students started to come from everywhere, we knew our big vulnerability at the digital frontier was that we couldn’t service them 24/7. Watson is
always up and running, making services available to students at any time” (Lacity, Scheepers, Willcocks, & Craig, 2017, p. 14). Deakin’s internally-built system combines the university’s learning management system, digital library, and its support system, but unlike other institutions, Deakin closely supervises its chatbot, rejecting the option for the system to assimilate popular answers in lieu of accurate responses and keeping a log of all its activity (Coyne, 2017; Lacity et al., 2017). The first release was launched after three steps were completed, centered around collecting nearly 20,000 questions, finding the correct answers, and preparing the content for Watson. During its inaugural year, Genie answered more than 55,000 questions, during which time, Deakin tracked the accuracy of the responses closely, and found that it correctly answered questions, or offered an appropriate response, approximately 80% of the time. At that time, Deakin expanded Genie during its second and third release, when it was connected to the university’s website and online handbook and programmed it to provide more specific answers (Lacity et al., 2017; Popenici & Kerr, 2017).

Also using IBM’s Watson is Bolton College, located in the United Kingdom, with its system, named Ada. This system delivers personalized and timely learning and assessment materials and is already able to respond to more than 2,000 distinct inquiries, ranging from general questions about the college to specific questions about their academic studies (Hussain & Baggaley, 2017). Similarly, Australia’s University of Canberra has implemented a pair of chatbots to assist both students and staff in obtaining institutional information. Lucy, which services students, and Bruce, which assists staff and faculty, are based on the Microsoft Azure Bot Framework. While Bruce searches within the University of Canberra’s intranet to answer employee inquiries and provides
answers via the Microsoft Teams application, Lucy scans the institution’s student support content to help answer student questions (See Appendix C). In the event Lucy cannot locate the answer, a ticket is raised with the student center through Canberra’s CRM (Kiernan, 2017; Perry, 2018; Powell, 2018). Also, in Australia, the University of Adelaide had piloted a chatbot that could calculate a students’ ATAR scores and provide that information to the student. Access to immediate ATAR scores, which determine class placement, helps students make faster, more accurate decisions regarding enrollment (Zeichick, 2018). By handling these inquiries by chatbot, rather than inbound phone calls, the university decreased incoming call traffic by 40% (Powell, 2018).

At BI Norwegian Business School, a chatbot is now responding to student inquiries regarding assignment completion and other academic work, providing information as a virtual teaching assistant. A similar implementation occurred at Georgia Institute of Technology, when a computer science professor used a chatbot, named Jill Watson, as a teaching assistant. He only revealed that fact to his students after the end of the semester. Per the professor, the students did not suspect they were communicating with a machine (Blumenstyk, 2018; Goel et al., 2015; McNeal, 2016; Winkler & Sollner, 2018).

In 2019, Staffordshire University became the first university in the United Kingdom to deploy its chatbot, Beacon, to provide support for students and assist them in navigating on-campus life. Beacon provides responsive and personalized information that connects students with personal tutors and provides answers to more than 400 frequently asked questions. After less than two months, Beacon had received more than 6,000 questions (Sawers, 2019; Stoller, 2019) (See Appendix D).
In the United States, the University of Southern California has Tommy Bot, named after the institution’s mascot, Tommy Trojan. Operating via Facebook Messenger, Tommy Bot can answer basic questions. However, the results provided by the bot are continuously expanding, especially as information is provided via community-driven roots, where students serve as designers, developers, and entrepreneurs on the project. After its inception, Tommy Bot was receiving 500 inquiries each day (Nguyen, 2017). In 2018, Colorado State University became one of several institutions that began offering the chatbot YOU at College, which helps students and staff recognize mental health issues and connect them to wellness support services (McKenzie, 2018b).

Allegheny College, a private liberal arts college in Pennsylvania, used AdmitHub to launch its chatbot, Chompers, based on the school’s alligator mascot. Despite its relatively small population, around 2,000 students, college leaders knew they had to provide individualized support to their students without overburdening college staff. Chompers provides nudges to guide students through the enrollment process while helping college officials better evaluate student interest instantly, by allowing students to engage on their terms. Thus far, the results have been promising. After one nudge, the Class of 2021 Facebook page had 30 new sign-ups within the first hour, and 268 (out of 414) since Chompers’ first message. Allegheny used the system to prompt students to engage with the college via social media, which provides another form of communication. Additionally, post-visit survey responses increased and event registrations more than doubled (Daulerio & Serna, 2017).

In Madison, Wisconsin, funding provided by Great Lakes Higher Education Guaranty Corp. created a pilot study that provided text messages to assist college-bound
students during their post-high school summer semester. The three-year study provided personalized text prompts to students, reminding them of immediate action items. If the student needed more assistance, he or she could text back and work with a counselor via text, phone calls, or face-to-face meetings. Study results indicated an increase in two-year college enrollment by three to nine percentage points, and the Madison school district elected to continue funding the program – at its own expense – after the study’s initial funding ended (Rivedal, 2018).

The popularization of artificial intelligence in American higher education has forced colleges and universities to adapt and implement the technology meaningfully. To date, the largest initiative designed to navigate the complex world of AI has been taken by the Massachusetts Institute of Technology (MIT), which created a new AI-centric college backed by a $1 billion investment (Lohr, 2018). MIT President L. Rafael Reif said the college will hire 50 new faculty members and will begin holding classes during the fall 2019 semester, with the new building finalized by 2022 (Rosen, 2018). This new college will have a cross-disciplinary faculty population that will help professors apply AI to other disciplines, while also taking what is learned from these processes back to the college to improve AI (Gardner, 2018b). The new AI college, which will also promote research and teaching on AI and computing, “marks the single largest investment in computing and AI by an American academic institution, and will help position the United States to lead the world in preparing for the rapid evolution of computing and AI (Jaschik, 2018).

On campus, chatbot implementation frees up countless hours from staff and faculty, from admissions personnel who previously had to generate decisions and
outcome letters from paper files or isolated databases, to faculty advisors, who may have previously checked in on a student once per semester, since there was no system trigger to alert them to a potential failing grade (Field, 2018; Gardner, 2018a). Artificial intelligence also creates opportunities for institutions to improve efficiency, while also creating cost-saving measures to improve its financial bottom line (King, 2017). While several institutions across the globe have started using chatbots, specifically applying this technology to financial aid processes may be a viable option.

Facing increasing costs and decreasing revenue streams due to high attrition, institutions may be hesitant to spend additional financial resources on a technological platform to help resolve the issue. However, in the current global and political economy, colleges and universities must be prepared to integrate and devote sufficient resources to financial aid access, and communication of that access, as an integral component of a retention platform. Following national, political, and societal pressure to graduate more students, higher education administrators must develop a platform to address the demand (Archibald & Feldman, 2011). Since access to financial aid information is critical to student persistence, recruiting students who will start paying, and retaining them so they continue paying, is essential to the financial structure of most institutions, even if it requires a technological investment.

Currently, recruitment and retention are at the forefront of any discussion on how institutions of higher learning remain financially viable amidst decreasing state appropriations following the 2008 recession. Retention, more often than recruitment, generates criticism towards institutions; however, there is no single solution to address increasing attrition. Since “a student’s likelihood to persist is influenced by a complex set
of interpersonal, social, academic, financial, and institutional factors…colleges and universities are often left trying to address challenges over which they have seemingly little control” (Jobe et al., 2016, p. 10). The authors note student attrition may be linked to a lack of proper expectations of the incoming student body, referring mainly to academic challenges (Jobe et al., 2016; Jobe & Lenio, 2014), yet they fail to note the lack of appropriate financial expectations. Even institutions that spend significant amounts on retention efforts and increased student aid programming suffer a staggeringly high dropout rate (Jones-White, Radcliffe, Lorenz, & Soria, 2014).

It is estimated that taxpayers at both the state and federal levels spend more than $9 billion each year educating students who will not return for a second year (Johnson, 2012). To counteract first year attrition, Jobe et al. (2016) suggest institutions increase efforts to engage students socially and academically. While efforts made to connect to students are valuable, connecting with students financially is also critical, remaining cognizant that access to financial aid and related information has a link to a students’ persistence. At institutions that serve a large first-generation, minority, or low-income population, access to financial aid information may be as critical as the aid itself. Thus, this project aims to collect and analyze data on the perceptions of the tools and resources that convey that information.
CHAPTER III – RESEARCH METHODOLOGY

This chapter will detail and present the methodological approach used to collect the data for this action research study. First, the purpose of the study will be reiterated in the context of an action research approach that justifies the use of this model, followed by a detailed discussion of the application of a post-positivistic lens as a theoretical framework. After reiterating the research questions, defining the target populations, and detailing the recruitment of participants, the research design and methodology are detailed, including information on the development of the survey instruments and the methodological timelines. Notes on the management of the data will precede discussions of reliability and validity, the role of the researcher, and ethical concerns, followed by assumptions and limitations.

Purpose of Study

Although there are many research instruments, the decision to implement a survey seemed most appropriate in attempting to evaluate the perceptions of a new technology, like chatbots. As previously noted, the use of chatbots is a very recent emergence within higher education, and although this technology has already been used in a myriad of ways, action research is the best way to examine perceptions of this research within a specific educational institution and with prescribed populations. Since this research was conducted at The University of Southern Mississippi (USM), located in Hattiesburg, Mississippi, it is important to understand that the student population and the retention challenges at this university makes gathering this data at any other institution – and attempting to apply it to USM – an unfair comparison.
According to the university’s Office of Institutional Research, retention remains a persistent challenge, as the Fall 2017 retention rate of first-time, full-time freshmen was 71.5%, which means that nearly 30% of cohort students did not return for their second year (“Fall 2017 Snapshot,” 2018). The snapshot (2018) also reported a 46.7% six-year graduation rate, indicating that retention is a problem that continues after the first year. Details regarding academic classification levels of USM students are available in Appendices E and F, as dictated by the IHL.

This survey-based study was designed to evaluate the perceptions of enrollment management staff and former USM students of a chatbot that provides financial information in real-time. Data were collected by surveying former students to evaluate their perceptions on the viability of a proposed chatbot, and if such a device would influence their decision to return to the institution. Employees in the admissions, business services, financial aid, and retention offices were also surveyed to evaluate their perceptions about whether a chatbot would provide benefits to the students and the staff.

Theoretical Framework

According to Savin-Baden and Major (2013), action research can be situated within several different research traditions, depending on the focus of the project. For this body of research, a post-positivistic approach is most applicable. Despite its origins in anthropological research, the post-positivistic approach was heavily adopted into education in the United States during the 1960s civil rights movement, when “[t]here was a need to transform schools into institutions in which more democratic and humanitarian values are embraced and serve the best interests of society rather than the government. The best way
to learn about the best interests of society was to ask the society itself. Thus, society became a partner in research” (Tekin & Kotaman, 2013, p. 83).

In a traditional or post-positivist approach “a primary researcher tends to identify an issue for investigation, presents the relevant research evidence for exploration and possible interventions and involves practitioners in suggested action, for example to test out, validate and refine a particular theory, tool or instrument” (Wimpenny, 2013, p. 5). However, the post-positivist approach does not attempt to proclaim widespread generalizability, rather, it seeks to gain a detailed and in-depth understanding of the subject matter (Tekin & Kotaman, 2013). Thus, the lack of generalizability positions the research in a unique and singular setting, making the situation of the study an important notation.

Research Questions

Substantial research indicates prospective students and their families continue to lack accurate information about financial aid, although there is less information on how perceptions of financial aid are influenced by the modes of delivery in which information is conveyed (Perna, Lundy-Wagner, Yee, Brill, & Tadal, 2011). The purpose of this research was to evaluate the potential viability and perceived functionality of a chatbot prototype on the students and student services professionals at The University of Southern Mississippi. This research centered on the data collected from former students who departed from the institution prior to graduation and the student affairs professionals employed in the Office of Undergraduate Admissions, the Office of Financial Aid, Business Services, and the New Student and Retention Programs office. The research questions focused on the perceived efficacy of an artificial intelligence-based chatbot
prototype on financial aid and retention, targeted to each specific group. The overarching research questions, which were accompanied by a graphic markup of the chatbot prototype, were:

Student Research Question:

- As a former student at The University of Southern Mississippi, is a chatbot that automatically responds to student financial inquiries a viable communication tool?

Staff Research Question:

- As staff member in (admissions/financial aid/business services/retention office) at The University of Southern Mississippi, is a chatbot that automatically responds to student financial inquiries a viable communication tool?

To address the complexities associated with these research questions, the researcher elected to design and implement dual surveys designed at the targeted populations.

Target Populations

This study surveyed student services employees and former students at the institution regarding the viability of a proposed chatbot that would provide financial information via a chatbot linked to the current student platform, SOAR. The survey targeted two distinct groups within the institutional community, students and employees.

The first target population included all current staff members of the following student-facing units at USM: the Office of Admissions, Business Services, the Office of Financial Aid, and New Student and Retention Programs. This included a total of 58 staff
members at both the Hattiesburg and Gulf Park locations, all of which were emailed a survey link to their assigned USM email address.

The second target population included all USM students who withdrew from the institution after attending during the 2016-2017 academic year. The survey was sent to all students who met the criterion, and they were accessed with the university’s CRM under the direction of New Student and Retention Programs and Institutional Research.

The researcher chose these populations because the perspectives of these groups provide unique insight regarding a proposed chatbot. Since this research focused on the perceptions of how chatbot implementation would affect student attrition, the researcher surveyed student financial services, namely staff members from Business Services and the Office of Financial Aid, as well as the staff from the New Student and Retention Programs office. The researcher also included staff members from the Office of Admissions because those employees have a significant level of interaction with prospective and returning students. Similarly, the researcher elected to use student data from a single year to limit and attempt to mitigate the potential effects of social, economic, and political differences that may vary from year to year.

Participant recruitment.

Upon IRB approval, each prospective participant received a recruitment email with a link to a survey in Qualtrics™, an online survey tool. Via the informed consent letter, each participant was advised that he or she could engage voluntarily in the research, had the right and opportunity to withdraw from the study at any time, and that all data collected was completely anonymous and stored securely.
Current employees were sent an email with a link to the survey to their assigned USM email address on October 1, 2018. A second email was distributed on October 12, 2018 to staff members who had not yet completed the survey (See Appendix G). Former university students were sent an email to the most recent email address on file on November 13, 2018 (See Appendix H). The variation in survey launch dates was due to a delay in receiving the student population information from the university’s Institutional Review office.

Research Design and Methodology

The research instrument was a survey consisting of questions regarding the students’ experience with the financial aid and business services processes, how it influenced their persistence with the university, and their perceptions of a chatbot prototype designed to connect them directly with personalized financial aid and business services information (See Appendix I). A second survey was distributed to enrollment management staff at the institution (See Appendix J). This survey instrument addressed their perceptions of the communication breakdown known as the ‘Southern Miss Shuffle,’ which is the unofficial term used on campus to describe the frequent transfer of students. The survey also collected respondents’ perceptions regarding if a chatbot would improve communication with students and if it would improve their roles as employees.

Survey Instruments

The staff survey contained 52 questions divided into four sections and was aimed at eliciting feedback regarding the staff member’s experience as an employee with the institution. The four sections were: demographic questions, general USM staff member
experience, institutional communication experience, and reflections on the proposed use of a chatbot (See Appendix J).

The student survey contained 61 questions divided into seven sections and was aimed at eliciting feedback regarding the student’s experience with USM. The six sections were: demographic questions, general USM experience, institutional financial aid experience, institutional business services experience, institutional communication experience, and reflections on the proposed use of a chatbot (See Appendix I).

Methodological timeline.

The data collection process began in the Fall 2018 semester, immediately after the researcher was approved to conduct the project by the Institutional Review Board (IRB) (See Appendix L). After 30 consecutive days, both surveys were closed.

Qualitative data analysis.

Although most of the questions were designed to allow respondents to choose from pre-selected answer(s), some questions afforded respondents the option of entering an open text-based response. While the pre-selected responses were assigned a numeric value to code the data, the text-based responses were evaluated thematically. The researcher employed the use of thematic analysis, a process in which the researcher searches for recurring ideas, or themes, within a data set. After selecting the initial themes, the researcher reviewed them to evaluate concepts that could be combined into broader ideas, or to divide larger themes that should not have been combined (Riger & Sigurvinsdottir, 2015).

Data Management
The surveys distributed to all prospective respondents were designed and managed using Qualtrics™, which were housed on a secure server until the completion of the project. Upon completion, both surveys were destroyed, and responses deleted from the site. All personally identifiable information was permanently removed from the Excel file. After all personal identification was removed, back-up copies were stored in a portable USB flash drive and uploaded to the researcher’s private Google Drive account, only accessible by the researcher.

Reliability and Validity

Action research, by definition, is not designed to be generalizable, as it seeks conditional knowledge. However, this does not mean that information derived from action research cannot be used by or for the benefit of others (Tekin & Kotaman, 2013). Unlike other forms of research, where the researcher must consider reliability and validity, action research creates questions that allow participants to engage in the process and to contribute to the established body of knowledge (Smith, 2017).

Role of the Researcher

This section attempts to clarify and examine how the researcher identifies herself within the context of social lenses. Through this careful examination, the researcher details her lived experiences to signify that appropriate efforts were made to distinguish between personal experiences and the experiences of the respondents. By conveying this information, readers can better situate the researchers’ decisions regarding survey structure, detecting themes within the data, and creating the coding system used to organize responses. Since this portion of the research is descriptive in nature, it can also be seen as interpretive (Stake, 2010). Since interpretations can be faulty and subject to
bias, it is imperative not only to provide a basic, yet definitive, background of the researcher.

The researcher has worked in higher education since 2010 and holds a Bachelor of Arts in Journalism and a Master of Arts in Adult Education. None of the former students included on the distribution list had a direct relationship with the researcher that would reflect a potential conflict of interest. Since the researcher has worked at The University of Southern Mississippi since 2014, she maintained professional relationships with many of the staff members included on the distribution list. Specifically, the researcher worked in the University’s Office of Financial Aid from January 2014 to July 2015, the University’s Office of Admissions from July 2015 to February 2017, and University Business Services from February 2017 to March 2018. From these professional experiences, the researcher reflected on potential communication challenges faced within each of these units and designed the surveys with these experiences in mind.

Ethical Concerns

The researcher ensured that ethical practices remained the top priority throughout the duration of this study. Following the prescribed methods outlined in this chapter helped ensure the validity and reliability of the study. Additionally, an Informational Letter and Informed Consent Letter were provided to both populations surveyed, as shown in Appendices K and M. As stipulated in the IRB application, risks to human subjects associated with this study were minimal. All participants were over the age of 18; therefore, no minor children were solicited through this survey process. All responses were disposed of following the submission and acceptance of this research, minimizing any future risks related to confidentiality.
Assumptions and Limitations

Assessing the outcomes of research based on survey responses for data can be challenging, since the data are structured in a way that includes both open-ended and close-ended questions. Since the purpose of this research was to collect insight on the perceived viability of a chatbot to improve student financial communication, data were collected from both students and staff members.

Survey-based data collection processes create a set of assumptions and limitations of which the researcher must be aware. As with any survey, the researcher made the assumption that all respondents would answer the survey questions honestly and that the criteria that make up the survey questions were an appropriate way to measure the defined research questions. Additionally, limitations that must be considered include target populations that did not accurately reflect the population as a whole and that the self-reported data could be potentially affected by the individual’s bias. In addition to assumptions and limitations that commonly occur in survey research, this project may have an additional limitation stemming from conducting a study on such a young population.

Limited research on Generation Z.

Despite an influx of publications analyzing Generation Z and evaluating how this population will function in an educational environment currently designed for Millennials, there is still limited research on who Generation Z really is. Much of the research that currently exists has been generated by market research agencies, rather than academic organizations (Seemiller & Grace, 2017), which creates limited opportunities for comparison, while much of the analysis serves as conjecture.
In addition to a distinct lack of academic research on Generation Z, it is pertinent to note that any generational research may be problematic by design. There is an underlying assumption that can be made which potentially ascribes characteristics displayed by the majority as applicable to all members of that generation. In reality, personal experiences vary greatly, and not all members of a generation share the same beliefs and experiences. Seemiller & Grace (2017) note “[a]lthough not everyone born in a generational period shares the same values or experiences, they do share a common context that shapes their worldview. Thus, generational research can provide institutions with valuable information to design effective policies, programs, and practices” (p. 21).

Summary

Current literature on retention strategies, the challenges associated with financial aid, the potentially negative effect of financial aid on persistence, and the possible inclusion of an institutional chatbot to address these discrepancies appear to warrant some review, if utilized in tandem. Thus, this research attempted to obtain feedback, via surveys, from those most involved in the financial aid process, both from student and staff perspectives. While it may seem logical that most institutions could benefit from the structure implemented by Georgia State with the introduction of Pounce, it is crucial to evaluate the potential efficacy of this prototype within the lens of the institution focused on in this research. Since there are several technological platforms currently used in the higher education sector, it would be negligent to assume that a one-size-fits-all approach is the answer to the challenges that currently exist in departments directly involved in the handling of student finances at The University of Southern Mississippi.
This research does not intend to prove that a chatbot is the singular answer, or even one of a collection of answers, to cope with institutional shuffle. Moreover, any findings indicated in Chapter 4 are not generalizable and, therefore, should not be applied to any other institution or specific population. Rather, this research attempted to gather perspectives from those who would be tasked with preparing the chatbot and those who would utilize the chatbot.
CHAPTER IV – FINDINGS AND DISCUSSION

The purpose of chapter four is to present and discuss the findings from this research. The first section of this chapter details participant demographics, the second section provides detailed accounts of the findings and the third section is a summation of findings. The fourth section is a discussion of the research which is followed by a narrative on the implications for higher education professionals. The final section provides recommendations for future research.

Participant Demographics

Former student population.

The online survey was distributed to 2,717 students who were enrolled at USM during the 2016-2017 academic year, but who did not enroll during the 2017-2018 academic year. A total of 69 responses were received, of which 16 were incomplete and discarded. This created a final sample size of 53 responses that were analyzed. Frequency tables for respondent sex, generation, and self-reported income level are reported below in Tables 2-4.

Table 2
Frequencies for Sex of Former Student Respondent Population

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>11</td>
<td>20.8</td>
<td>20.8</td>
<td>20.8</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>79.2</td>
<td>79.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3
*Frequencies for Generation of Former Student Respondent Population*

<table>
<thead>
<tr>
<th>Generation</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>11</td>
<td>20.8</td>
<td>20.8</td>
<td>26.4</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>14</td>
<td>26.4</td>
<td>26.4</td>
<td>52.8</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>25</td>
<td>47.2</td>
<td>47.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0</td>
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<td></td>
</tr>
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Table 4
*Frequencies for Income Level of Former Student Respondent Population*

<table>
<thead>
<tr>
<th>Income</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
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<tr>
<td>Less than $20,000</td>
<td>14</td>
<td>26.4</td>
<td>26.4</td>
<td>26.4</td>
</tr>
<tr>
<td>$20,000 to $29,999</td>
<td>11</td>
<td>20.8</td>
<td>20.8</td>
<td>47.2</td>
</tr>
<tr>
<td>$30,000 to $39,999</td>
<td>5</td>
<td>9.4</td>
<td>9.4</td>
<td>56.6</td>
</tr>
<tr>
<td>$40,000 to $49,999</td>
<td>4</td>
<td>7.5</td>
<td>7.5</td>
<td>64.2</td>
</tr>
<tr>
<td>$50,000 to $59,999</td>
<td>4</td>
<td>7.5</td>
<td>7.5</td>
<td>71.7</td>
</tr>
<tr>
<td>$60,000 to $69,999</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>77.4</td>
</tr>
<tr>
<td>$70,000 to $79,999</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>83.0</td>
</tr>
<tr>
<td>$80,000 to $89,999</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>83.0</td>
</tr>
<tr>
<td>$90,000 to $99,999</td>
<td>2</td>
<td>3.8</td>
<td>3.8</td>
<td>86.8</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>1.9</td>
<td>1.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Enrollment management staff.*

The online survey was distributed to 58 current employees at USM. A total of 21 complete responses were received. Frequency tables for respondent sex, generation, and department are reported below in Tables 5-7.

Table 5
*Frequencies for Sex of Enrollment Management Staff Respondent Population*

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>1</td>
<td>4.8</td>
<td>20.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>38.1</td>
<td>38.1</td>
<td>42.9</td>
</tr>
</tbody>
</table>

69
Table 5  
*Frequencies for Sex of Enrollment Management Staff Respondent Population*

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>12</td>
<td>57.1</td>
<td>57.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6  
*Frequencies for Generation of Enrollment Management Staff Respondent Population*

<table>
<thead>
<tr>
<th>Generation</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>1</td>
<td>4.8</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>3</td>
<td>14.3</td>
<td>14.3</td>
<td>19.0</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>15</td>
<td>71.4</td>
<td>71.4</td>
<td>90.5</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>2</td>
<td>9.5</td>
<td>9.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7  
*Frequencies for Department of Enrollment Management Staff Respondent Population*

<table>
<thead>
<tr>
<th>Department</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admissions</td>
<td>11</td>
<td>52.4</td>
<td>52.4</td>
<td>52.4</td>
</tr>
<tr>
<td>Business Services</td>
<td>2</td>
<td>9.5</td>
<td>9.5</td>
<td>61.9</td>
</tr>
<tr>
<td>Financial Aid</td>
<td>5</td>
<td>23.8</td>
<td>23.8</td>
<td>85.7</td>
</tr>
<tr>
<td>New Student &amp; Retention Programs</td>
<td>3</td>
<td>14.3</td>
<td>14.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Research Findings

*Quantitative analysis.*

To analyze the perceptions of chatbot implementation on the selected populations, cross tabulations were conducted on a number of descriptive markers and various demographic indicators, including respondent generation, income range (former students only), and the department the respondent works in (staff only). The researcher conducted
a series of cross-tabulations to evaluate perceptions of each group individually based on this demographic information while also combining populations to establish a more exhaustive body of research. Findings from each population are addressed individually below, with a final section that includes a combination of both populations.

Former student findings.

Responses from the former students surveyed during this research were quantitatively analyzed on four different questions:

- CHATBOTCOMM: If you were able to communicate with the Financial Aid Office and Business Services via a chatbot, would you use the system?
- CHATBOTBUS: How effective do you believe a chatbot designed to assist students with their business services’ account would be?
- CHATBOTFA: How effective do you believe a chatbot designed to assist students with financial aid would be?
- CHATBOTINST: If a chatbot was offered by a college/university, how would that change your perception of the institution?

CHATBOTCOMM allowed respondents to select yes, no, or unsure, while CHATBOTBUS and CHATBOTFA provided a Likert scale ranging from very effective (1) to very ineffective (5). The CHATBOTINST provided a Likert scale ranging from My opinion would be much higher (1) to My opinion would be much lower (5). The means for each of these areas are indicated below (See Table 8).
Table 8
Descriptive Statistics of Former Student Respondent Population

<table>
<thead>
<tr>
<th></th>
<th>CHATBOTCOMM</th>
<th>CHATBOTFA</th>
<th>CHATBOTBUS</th>
<th>CHATBOTINST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Mean</td>
<td>1.264</td>
<td>2.321</td>
<td>2.264</td>
<td>2.736</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.5244</td>
<td>1.603</td>
<td>1.571</td>
<td>1.456</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.000</td>
<td>1.000</td>
<td>1.00</td>
<td>1.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.000</td>
<td>6.000</td>
<td>6.000</td>
<td>6.000</td>
</tr>
</tbody>
</table>

Based on this analysis, former student respondents indicated they would be willing to use a chatbot if it were offered, while indicating that chatbots specifically focused on financial aid and business services would be effective. Despite these preferences, this population remained neutral on whether or not a chatbot would change their perception of an institution. Since this research was partially targeted at students who did not persist at USM, respondents were asked to evaluate their decision to re-enroll at USM if the institution adopted a chatbot. Of the 53 students who completed the survey in full, more than half said a chatbot would have no effect on their decision to reenroll, while 15% said a chatbot at USM would make them more likely to reenroll (See Figure 1).
Figure 1. Student respondents on how a chatbot would affect their decision to reenroll at USM (by percentage).

When analyzing each question individually, 77.4% of respondents indicated that they would use a chatbot to communicate with Financial Aid and Business Services if it were available (See Table 9). The questions about financial aid and business services chatbots found that 71.7% of respondents indicated the concepts were very effective or effective (See Table 10 and 11). Only 11.3% of respondents felt a financial aid chatbot was very ineffective, while 9.4% indicated a business services chatbot would be very ineffective (See Tables 10 and 11).

Table 9
Frequencies for CHATBOTCOMM Response of Former Student Respondent Population

<table>
<thead>
<tr>
<th>CHATBOTCOMM</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>41</td>
<td>77.4</td>
<td>77.4</td>
<td>77.4</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>18.9</td>
<td>18.9</td>
<td>96.2</td>
</tr>
<tr>
<td>Unsure</td>
<td>2</td>
<td>3.8</td>
<td>3.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10
Frequencies for CHATBOTFA Response of Former Student Respondent Population

<table>
<thead>
<tr>
<th>CHATBOTFA</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very effective</td>
<td>22</td>
<td>41.5</td>
<td>41.5</td>
<td>41.5</td>
</tr>
<tr>
<td>Effective</td>
<td>16</td>
<td>30.2</td>
<td>30.2</td>
<td>71.7</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>77.4</td>
</tr>
<tr>
<td>Ineffective</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>83.0</td>
</tr>
<tr>
<td>Very Ineffective</td>
<td>6</td>
<td>11.3</td>
<td>11.3</td>
<td>94.3</td>
</tr>
<tr>
<td>Unsure</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11
Frequencies for CHATBOTBUS Response of Former Student Respondent Population

<table>
<thead>
<tr>
<th>CHATBOTBUS</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very effective</td>
<td>23</td>
<td>43.4</td>
<td>43.4</td>
<td>43.4</td>
</tr>
<tr>
<td>Effective</td>
<td>15</td>
<td>28.3</td>
<td>28.3</td>
<td>71.7</td>
</tr>
<tr>
<td>Neutral</td>
<td>4</td>
<td>7.5</td>
<td>7.5</td>
<td>79.2</td>
</tr>
</tbody>
</table>
Table 11
*Frequencies for CHATBOTBUS Response of Former Student Respondent Population*

<table>
<thead>
<tr>
<th>CHATBOTBUS</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>84.9</td>
</tr>
<tr>
<td>Very Ineffective</td>
<td>5</td>
<td>9.4</td>
<td>9.4</td>
<td>94.3</td>
</tr>
<tr>
<td>Unsure</td>
<td>3</td>
<td>5.7</td>
<td>5.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Another cross-tabulation was conducted on perceptions of a financial aid chatbot and organized by respondent generation. This analysis found that 84% of Generation Z respondents reported the concept as *very effective* or *effective*. This percentage dropped for Millennials and Generation X, with only 57.2% and 72.6% reporting the concept as *very effective* or *effective*. That percentage dropped even further for Baby Boomers, as only one-third of that respondent population indicated the concept was *very effective* or *effective* (See Table 12).

Table 12
*Contingency Table for CHATBOTFA by Generation of Former Student Respondent Population*

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>Very effective</th>
<th>Effective</th>
<th>Neutral</th>
<th>Ineffective</th>
<th>Very Ineffective</th>
<th>Unsure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Count % of Total</td>
<td>1.9 %</td>
<td>0.0 %</td>
<td>0.0 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>0.0 %</td>
<td>5.7 %</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>5.00</td>
<td>3.00</td>
<td>1.00</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>11.00</td>
</tr>
<tr>
<td>Count % of Total</td>
<td>9.4 %</td>
<td>5.7 %</td>
<td>1.9 %</td>
<td>0.0 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>20.8 %</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>3.00</td>
<td>5.00</td>
<td>1.00</td>
<td>1.00</td>
<td>3.00</td>
<td>1.00</td>
<td>14.00</td>
</tr>
<tr>
<td>Count % of Total</td>
<td>5.7 %</td>
<td>9.4 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>5.7 %</td>
<td>1.9 %</td>
<td>26.4 %</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>13.00</td>
<td>8.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Count % of Total</td>
<td>24.5 %</td>
<td>15.1 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>47.2 %</td>
</tr>
</tbody>
</table>
A similar analysis was conducted on a proposed business services chatbot and found the same percentage of Generation Z respondents, 84%, rated the concept as very effective or effective. This percentage dropped to 57% of Millennial respondents, 72% of Generation X respondents, and 33% of Baby Boomer respondents (See Table 13). It appears that positive perceptions of chatbots are more likely to be reported by the youngest respondents, Generation Z, while the favorability negatively correlates to an increase in age. In these analyses, Generation X and Millennials stagnated in the middle, although a larger percentage of Generation X respondents in both groups rated the concept as very effective or effective.

Table 13
Contingency Table for CHATBOTBUS by Generation of Former Student Respondent Population

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>CHATBOTBUS</th>
<th>Very effective</th>
<th>Effective</th>
<th>Neutral</th>
<th>Ineffective</th>
<th>Very Ineffective</th>
<th>Unsure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>Count</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.00</td>
<td>0.00</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>1.9 %</td>
<td>0.0 %</td>
<td>0.0 %</td>
<td>0.0 %</td>
<td>3.8 %</td>
<td>0.0 %</td>
<td>5.7 %</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>Count</td>
<td>4.00</td>
<td>4.00</td>
<td>1.00</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>11.00</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>7.5 %</td>
<td>7.5 %</td>
<td>1.9 %</td>
<td>0.0 %</td>
<td>1.9 %</td>
<td>1.9 %</td>
<td>20.8 %</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>Count</td>
<td>5.00</td>
<td>3.00</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
<td>14.00</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>9.4 %</td>
<td>5.7 %</td>
<td>1.9 %</td>
<td>3.8 %</td>
<td>3.8 %</td>
<td>1.9 %</td>
<td>26.4 %</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>Count</td>
<td>13.00</td>
<td>8.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
<td>1.00</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>24.5 %</td>
<td>15.1 %</td>
<td>3.8 %</td>
<td>1.9 %</td>
<td>0.0 %</td>
<td>1.9 %</td>
<td>47.2 %</td>
</tr>
</tbody>
</table>

The cross-tabulation that compared respondent income level to their perception of a financial aid chatbot found that those with a self-reported income of less than $30,000 were more likely to indicate that the concept was very effective or effective (See Figure 75).
2). This suggests that respondents were more likely to have a favorable impression of the financial aid chatbot if they had a lower income. Once the income level reached the range of $30,000 to $39,999, the rates in which respondents selected very effective or effective stagnated and then diminished, until an uptick occurred at the greater than $100,000 income mark (See Figure 2).

Figure 2. ‘Very effective’ rating of CHATBOTFA former student respondent population by income level.

When conducting the same analysis for the business services chatbot, a similar trend emerged, as 24.5% of respondents who rated the concept as very effective had self-reported incomes of less than $40,000. By comparison, only 7.5% of respondents from the top three income ranges, $80,000 to $89,999, $90,000 to $99,999, and greater than $100,000 rated the concept as very effective (See Figure 3). When comparing the very effective increases of the greater than $100,000 groups, there is a slightly larger increase in the business services chatbot than with the financial aid chatbot.
When analyzing the breakdown of the 77.4% of respondents who indicated they would use a chatbot to communicate with the Financial Aid Office and Business Services, 38% self-reported their income as less than $30,000. The same response from higher income brackets decreased steadily before stagnating at the range of $50,000 to $100,000. At the greater than $100,000 mark, there was a slight increase, as 7.5% of respondents classified in that income range indicated they would use a chatbot system if it were offered to them (See Figure 4).
A cross-tabulation compared former student respondents by generation regarding their response to the question *If you were able to communicate with the Financial Aid Office and Business Services via a chatbot, would you use the system?* which is coded as CHATBOTCOMM. Of the 77.4% of respondents who would use a chatbot, 41.5% were classified as Generation Z, while Millennials and Generation X classifications each represented 17%, and only 1.9% were classified as Baby Boomers (See Figure 5).
One of the overarching goals of this research was not only to evaluate perceptions of the chatbot as a means of communication, but to evaluate how students, as end users, would perceive an institution that elected to implement a chatbot platform. To address this, respondents were asked this question: If a chatbot was offered by a college/university, how would that change your perception of the institution? Response options ranged from My opinion would be much higher to My opinion would be much lower. These results were compared and cross-tabulations were conducted to evaluate how these answers varied by respondent generation and self-reported income level. When reviewing this question compared to the respondent’s generation, the analysis found that 45.2% of respondents indicated their opinion would be much higher or slightly higher, while another 35.8% indicated there would be no difference in their opinion. Only 1.9% of respondents indicated their opinion would be slightly or much lower (See Table 14). When evaluating each generation individually, a majority of Generation Z and Millennial
respondents indicated their opinion would be *much higher* or *slightly higher*.

Conversely, the largest portion of Generation X and Baby Boomer respondents indicated there would be no difference in their opinion of the institution.

Table 14
Contingency Table for CHATBOTINST by Generation of Former Student Respondent Population

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>CHATBOTINST</th>
<th>My opinion would be higher</th>
<th>My opinion would be slightly higher</th>
<th>There would be no difference in my opinion</th>
<th>My opinion would be slightly lower</th>
<th>My opinion would be much lower</th>
<th>Unsure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>Count % of Total</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.00</td>
<td>0.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>Count % of Total</td>
<td>1.00</td>
<td>2.00</td>
<td>6.00</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>11.00</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>Count % of Total</td>
<td>1.00</td>
<td>2.00</td>
<td>9.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>14.00</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>Count % of Total</td>
<td>9.00</td>
<td>8.00</td>
<td>4.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
<td>25.00</td>
</tr>
</tbody>
</table>

*Enrollment management staff findings.*

Responses from the enrollment management staff members surveyed for this research were quantitatively analyzed on three different questions, coded as

STAFFBENEFIT (*If your office was able to communicate with students via a message portal chatbot, do you think the system would benefit the staff?*), CHATBOTFA (*How effective do you believe a chatbot designed to assist students with financial aid would be*?), and CHATBOTBUS (*How effective do you believe a chatbot designed to assist*
students with their business services’ account would be?). STAFFBENEFIT allowed respondents to select yes, no, or unsure, while CHATBOTBUS and CHATBOTFA provided a Likert scale ranging from very effective (1) to very ineffective (5). The means for each of these areas are indicated below (See Table 15).

Table 15
Descriptive Statistics of Enrollment Management Staff Respondent Population

<table>
<thead>
<tr>
<th></th>
<th>STAFFBENEFIT</th>
<th>CHATBOTFA</th>
<th>CHATBOTBUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Mean</td>
<td>1.381</td>
<td>2.619</td>
<td>2.524</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.8047</td>
<td>1.857</td>
<td>1.632</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.000</td>
<td>6.000</td>
<td>6.000</td>
</tr>
</tbody>
</table>

Based on this cross-tabulation, 81% of the enrollment management staff respondents indicated that a chatbot would benefit the staff (See Table 16).

Table 16
Frequencies for STAFFBENEFIT Response of Enrollment Management Staff Population

<table>
<thead>
<tr>
<th>STAFFBENEFIT</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
<td>81.0</td>
<td>81.0</td>
<td>81.0</td>
</tr>
<tr>
<td>Unsure</td>
<td>4</td>
<td>19.0</td>
<td>19.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: STAFFBENEFIT is a coded response for “If your office was able to communicate with students via a message portal chatbot, do you think the system would benefit the staff?”

For CHATBOTFA and CHATBOTBUS, the responses tended to be more neutral, with means between effective and neutral, although responses were closer to neutral than to effective. Despite this, 57.1% of respondents selected either very effective or effective for CHATBOTFA (See Table 17). This table also indicates that none of the staff surveyed selected very ineffective or ineffective for this question. For the CHATBOTBUS question, 61.9% of respondents indicated the concept would be very effective or effective.
Additionally, it should be noted that no staff members surveyed selected very ineffective or ineffective (See Table 18).

Table 17
Frequencies for CHATBOTFA Response of Enrollment Management Staff Population

<table>
<thead>
<tr>
<th>CHATBOTFA</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very effective</td>
<td>8</td>
<td>38.1</td>
<td>38.1</td>
<td>38.1</td>
</tr>
<tr>
<td>Effective</td>
<td>4</td>
<td>19.0</td>
<td>19.0</td>
<td>57.1</td>
</tr>
<tr>
<td>Neutral</td>
<td>5</td>
<td>23.8</td>
<td>23.8</td>
<td>81.0</td>
</tr>
<tr>
<td>Unsure</td>
<td>4</td>
<td>19.0</td>
<td>19.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: CHATBOTFA is a coded response for “How effective do you believe a chatbot designed to assist students with financial aid would be?”*

Table 18
Frequencies for CHATBOTBUS Response of Enrollment Management Staff Population

<table>
<thead>
<tr>
<th>CHATBOTBUS</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very effective</td>
<td>6</td>
<td>28.6</td>
<td>28.6</td>
<td>28.6</td>
</tr>
<tr>
<td>Effective</td>
<td>7</td>
<td>33.3</td>
<td>33.3</td>
<td>61.9</td>
</tr>
<tr>
<td>Neutral</td>
<td>5</td>
<td>23.8</td>
<td>23.8</td>
<td>85.7</td>
</tr>
<tr>
<td>Unsure</td>
<td>3</td>
<td>14.3</td>
<td>14.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: CHATBOTBUS is a coded response for “How effective do you believe a chatbot designed to assist students with their business services’ account would be?”*

Another metric used to evaluate perceptions was the respondent’s department.

This research solicited responses from members of four departments, Admissions, Business Services, Financial Aid, and New Student and Retention Programs (NSRP).

When evaluating the responses by department, 72.7% of Admissions respondents rated the concept as very effective or effective, compared to just half of Business Services respondents and 66.67% of NSRP respondents. None of the Financial Aid employee respondents reported the concept as very effective, although 20% indicated the concept was effective. Of the Financial Aid respondents, 60% rated themselves as neutral on the
concept (See Table 19). When reviewing the same concept for Business Services, 81.8% of Admissions respondents indicated it was very effective or effective, compared to 50% of Business Services respondents, 40% of Financial Aid respondents, and 33% of NSRP respondents (See Table 20).

Table 19
Contingency Table for CHATBOTFA by Department of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>DEPT</th>
<th>CHATBOTFA</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very</td>
<td>Effective</td>
<td>Neutral</td>
<td>Unsure</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>effective</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admissions</td>
<td>Count</td>
<td>6.00</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>% of</td>
<td>28.6%</td>
<td>9.5%</td>
<td>9.5%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Business Services</td>
<td>Count</td>
<td>0.00</td>
<td>1.00</td>
<td>3.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>% of</td>
<td>4.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.0%</td>
<td>4.8%</td>
<td>14.3%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Financial Aid</td>
<td>Count</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>% of</td>
<td>4.8%</td>
<td>4.8%</td>
<td>0.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4.8%</td>
<td>4.8%</td>
<td>0.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td>New Student &amp; Retention</td>
<td>Count</td>
<td>0.00</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Programs</td>
<td>% of</td>
<td>0.0%</td>
<td>4.8%</td>
<td>14.3%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.0%</td>
<td>4.8%</td>
<td>14.3%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Table 20
Contingency Table for CHATBOTBUS by Department of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>DEPT</th>
<th>CHATBOTBUS</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very</td>
<td>Effective</td>
<td>Neutral</td>
<td>Unsure</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>effective</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admissions</td>
<td>Count</td>
<td>4.00</td>
<td>5.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>% of</td>
<td>19.0%</td>
<td>23.8%</td>
<td>4.8%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Business Services</td>
<td>Count</td>
<td>0.00</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>% of</td>
<td>4.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.00</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Table 20
 Contingency Table for CHATBOTBUS by Department of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>DEPT</th>
<th>CHATBOTBUS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Effective</td>
</tr>
<tr>
<td>Financial Aid</td>
<td>0.0 %</td>
</tr>
<tr>
<td>% of Count</td>
<td>1.00</td>
</tr>
<tr>
<td>New Student &amp; Retention</td>
<td>4.8 %</td>
</tr>
<tr>
<td>Programs</td>
<td>% of Total</td>
</tr>
</tbody>
</table>

When evaluating responses by generation, more than half of surveyed employees classified as Millennials indicated a financial aid chatbot would be very effective, and 57.1% of all respondents indicated the concept would be very effective or effective.

Excluding Millennials, no other respondent generation indicated the concept would be very effective for this population (See Table 21). The business services chatbot (CHATBOTBUS) yielded a similar response, as 60% of Millennials rated the concept as very effective or effective. Again, no other generational group had any respondents indicate the CHATBOTBUS would be very effective (See Table 22).

Table 21
 Contingency Table for CHATBOTFA by Generation of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>CHATBOTFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very effective</td>
</tr>
<tr>
<td>Baby Boomer (1946-64)</td>
<td>0.0 %</td>
</tr>
<tr>
<td>% of Total</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Count</td>
<td>0.00</td>
</tr>
<tr>
<td>Generation X (1965-80)</td>
<td>0.0 %</td>
</tr>
<tr>
<td>% of Total</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Count</td>
<td>8.00</td>
</tr>
<tr>
<td>Millennials (1981-94)</td>
<td>38.1 %</td>
</tr>
<tr>
<td>% of Total</td>
<td>38.1 %</td>
</tr>
<tr>
<td>Count</td>
<td>0.00</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>0.0 %</td>
</tr>
<tr>
<td>% of Total</td>
<td>0.0 %</td>
</tr>
</tbody>
</table>
Table 22
Contingency Table for CHATBOTBUS by Generation of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>CHATBOTBUS</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very effective</td>
<td>Effective</td>
<td>Neutral</td>
<td>Unsure</td>
<td></td>
</tr>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>0.0 %</td>
<td>0.0 %</td>
<td>0.0 %</td>
<td>4.8 %</td>
<td>4.8 %</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>0.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>0.0 %</td>
<td>9.5 %</td>
<td>4.8 %</td>
<td>0.0 %</td>
<td>14.3 %</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>6.00</td>
<td>3.00</td>
<td>4.00</td>
<td>2.00</td>
<td>15.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>28.6 %</td>
<td>14.3 %</td>
<td>19.0 %</td>
<td>9.5 %</td>
<td>71.4 %</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>0.00</td>
<td>2.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>0.0 %</td>
<td>9.5 %</td>
<td>0.0 %</td>
<td>0.0 %</td>
<td>9.5 %</td>
</tr>
</tbody>
</table>

Enrollment management staff was also asked to evaluate if a chatbot would benefit them as staff members, and 81% agreed that it would. By department, 91% of Admissions respondents and 100% of both Business Services and NSRP respondents agreed. However, only 40% of Financial Aid staff respondents agreed (See Table 23).

Table 23
Contingency Table for STAFFBENEFIT by Department of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>DEPT</th>
<th>STAFFBENEFIT</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Yes</td>
<td>Unsure</td>
<td></td>
</tr>
<tr>
<td>Admissions</td>
<td>10.00</td>
<td>1.00</td>
<td></td>
<td>11.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>47.6 %</td>
<td>4.8 %</td>
<td></td>
<td>52.4 %</td>
</tr>
<tr>
<td>Business Services</td>
<td>2.00</td>
<td>0.00</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>9.5 %</td>
<td>0.0 %</td>
<td></td>
<td>9.5 %</td>
</tr>
<tr>
<td>Financial Aid</td>
<td>2.00</td>
<td>3.00</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>9.5 %</td>
<td>14.3 %</td>
<td></td>
<td>23.8 %</td>
</tr>
<tr>
<td>New Student &amp; Retention Programs</td>
<td>3.00</td>
<td>0.00</td>
<td></td>
<td>3.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>14.3 %</td>
<td>0.0 %</td>
<td></td>
<td>14.3 %</td>
</tr>
</tbody>
</table>
When evaluating respondents by generation, 100% of Generation Z respondents, 93.3% of Millennials, 33% of Generation X respondents, and zero percent of Baby Boomers noted that the system would benefit the staff (See Table 24).

Table 24
Contingency Table for STAFFBENEFIT by Generation of Enrollment Management Staff Population Respondents

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>STAFFBENEFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
</tr>
<tr>
<td>Millennials (1981-1994)</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
</tr>
<tr>
<td>Generation Z (1995-2012)</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
</tr>
</tbody>
</table>

Combined population findings.

A third portion of the cross-tabulations combined all responses, which allowed the opportunity to conduct a series of cross-tabulations on the entire research population.

This created a combined population of 74 respondents, 53, or 71.6% were former students and 21, or 28.4% are enrollment management employees. These two populations were given two identical questions on the surveys, CHATBOTFA (How effective do you believe a chatbot designed to assist students with financial aid would be?) and CHATBOTBUS (How effective do you believe a chatbot designed to assist students with their business services’ account would be?). Each used a Likert scale ranging from very effective to very ineffective. Based on the mean scores for the combined population, both
the financial aid and business services chatbots were ranked between effective and neutral, with means of 2.405 and 2.338 respectively (See Table 25).

Table 25
Descriptive Statistics for Combined Populations

<table>
<thead>
<tr>
<th></th>
<th>CHATBOTFA</th>
<th>CHATBOTBUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Mean</td>
<td>2.405</td>
<td>2.338</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.671</td>
<td>1.581</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>6.000</td>
<td>6.000</td>
</tr>
</tbody>
</table>

Cross-tabulations were also conducted to analyze all responses by respondent generation and status for both the financial aid and business services chatbot concepts.

When reviewing the proposed financial aid chatbot across all respondents and evaluating by generation, 81% of Generation Z respondents rated the concept as very effective or effective, compared to 62% of Millennials, 64% of Generation X, and 25% of Baby Boomers (See Table 26). The business services chatbot was rated as very effective or effective by 85% of Generation Z respondents, followed by 58.6% of Millennials, 71% of Generation X, and 25% of Baby Boomers (See Table 27).

Table 26
Contingency Table for CHATBOTFA by Generation for Combined Populations

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>CHATBOTFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very effective</td>
</tr>
<tr>
<td>Baby Boomer (1946-1964)</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total %</td>
</tr>
<tr>
<td>Generation X (1965-1980)</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total %</td>
</tr>
<tr>
<td></td>
<td>Count</td>
</tr>
</tbody>
</table>
When comparing former students to enrollment management staff, 71.6% of students rated the financial aid chatbot as *very effective* or *effective*, compared to only 57.1% of staff respondents (See Table 28), indicating that a larger percentage of students are favorable to the concept than staff. For the business services chatbot, 62% of staff and 71.6% of former students rated it as *very effective* or *effective* (See Table 29).
Table 28
Contingency Table for CHATBOTFA by Status for Combined Populations

<table>
<thead>
<tr>
<th>Status</th>
<th>Very effective</th>
<th>Effective</th>
<th>Neutral</th>
<th>Ineffective</th>
<th>Very Ineffective</th>
<th>Unsure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>22.00</td>
<td>16.00</td>
<td>3.00</td>
<td>3.00</td>
<td>6.00</td>
<td>3.00</td>
<td>53.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>29.7%</td>
<td>21.6%</td>
<td>4.1%</td>
<td>4.1%</td>
<td>8.1%</td>
<td>4.1%</td>
<td>71.6%</td>
</tr>
<tr>
<td>Count</td>
<td>8.00</td>
<td>4.00</td>
<td>5.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>21.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>10.8%</td>
<td>5.4%</td>
<td>6.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>5.4%</td>
<td>28.4%</td>
</tr>
</tbody>
</table>

Table 29
Contingency Table for CHATBOTBUS by Status for Combined Populations

<table>
<thead>
<tr>
<th>Status</th>
<th>Very effective</th>
<th>Effective</th>
<th>Neutral</th>
<th>Ineffective</th>
<th>Very Ineffective</th>
<th>Unsure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>23.00</td>
<td>15.00</td>
<td>4.00</td>
<td>3.00</td>
<td>5.00</td>
<td>3.00</td>
<td>53.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>31.1%</td>
<td>20.3%</td>
<td>5.4%</td>
<td>4.1%</td>
<td>6.8%</td>
<td>4.1%</td>
<td>71.6%</td>
</tr>
<tr>
<td>Count</td>
<td>6.00</td>
<td>7.00</td>
<td>5.00</td>
<td>0.00</td>
<td>0.00</td>
<td>3.00</td>
<td>21.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>8.1%</td>
<td>9.5%</td>
<td>6.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.1%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Staff</td>
<td>29.00</td>
<td>22.00</td>
<td>9.00</td>
<td>3.00</td>
<td>5.00</td>
<td>6.00</td>
<td>74.00</td>
</tr>
<tr>
<td>% of Total</td>
<td>39.2%</td>
<td>29.7%</td>
<td>12.2%</td>
<td>4.1%</td>
<td>6.8%</td>
<td>8.1%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Descriptive analysis of enrollment management staff responses.

While a significant portion of both surveys were quantitative, several questions allowed respondents to enter a text-based response. For each of these questions, there was no limit to the number of characters a respondent could enter, and none of these questions were required; therefore, the number and length of responses varied. Following a review of the text-based responses, the researcher elected to code them thematically, which created an opportunity to conduct a descriptive analysis. The researcher has identified
each response by their sex, generational classification, and their office of employment (staff only).

*Chatbot favorability.* Many of the staff members surveyed for this research indicated that they support the concept of a chatbot, and several cited a variety of reasons for their support. Through the analysis process, the researcher identified four major themes explaining respondent support for chatbot implementation: improving communication flow, providing a system that appeals to students, decreasing response time for students, and saving employee time by reducing time spent responding to repetitive questions. It is important to note that the first theme, improving communication, would be a benefit to both students and staff, while the second and third themes, creating a platform that appeals to students and decreasing response time are benefits to the student population. The final theme that emerged, saving employee time and decreasing time spent on repetitive inquiries, benefits the staff members.

The first theme that emerged was the suggestion that a chatbot would improve the current communication platform. One respondent (male, Millennial, Admissions) wrote “I think this would allow a more effective way of communication” while another indicated that chatbots could help the flow of information. That respondent (male, Millennial, Admissions) wrote “I feel like many students that Southern Miss interacts with simply do not understand much about financial aid. I feel as though a chatbot could help them gain knowledge and receive the information quickly.” Both responses indicate that there is a belief among some staff members that communication would improve with a chatbot.
The second subset of staff responses thematically coded as pro-chatbot centered around the respondent’s belief that a chatbot would appeal to students. One respondent (male, Millennial, Admissions) wrote “Today’s generation of students are often glued to technology in many different settings. Allowing communication through text would be a way of meeting today’s generation where they already are.” Another respondent (male, Millennial, Admissions) emphasized the highly connected student population, while also highlighting benefits for staff, writing “Literally everyone now-a-days has a phone and over 80% of people have a smart phone. If we want to be effective in our communication with students, providing a text message bot system would answer so many concerns, free up counselors to process paperwork, and much more. This is a no brainer that we need to implement this system at Southern Miss.” As identified in the first coded theme, both respondents who emphasized the appeal of a chatbot to the students are identified as Millennial males who work in the Office of Admissions.

Responses from a third staff population subset also addressed the potential appeal to students, but they emphasized that students would like a chatbot because they prefer to reach out electronically, rather than face-to-face or on the phone. One respondent (female, Millennial, Admissions), wrote “Students hate calling or going into an office to ask a question. They want to get an immediate response.” That response was echoed by another (female, Millennial, Financial Aid), who also addressed concerns about the complex information conveyed by the Office of Financial Aid. She wrote

Many students seem to have social anxiety that makes them prefer to send an email and wait for a response than call or visit the office for information. A chatbot option would improve the communication of general information to students, but I could
see how the complexity of financial eligibility could make a chatbot option less
effective if individualized responses from counselors were saved.
The demographic composition of the respondents identifying a social engagement
preference varied slightly, with one comment originating from an employee in the Office
of Admissions and another generated from a member of the Office of Financial Aid. Both
respondents are classified as female Millennials.

Another theme that emerged from the staff responses was the decrease in response
time to students. One respondent (female, Millennial, New Student and Retention
Programs) wrote “I think students would find this system extremely helpful. They would
receive the help they needed in an even quicker time,” while another respondent (female, 
Millennial, New Student and Retention programs) wrote “This system allows students to
get an instant response, which is helpful when our staff is unavailable.”

A final theme that emerged from the staff’s text-based responses emphasized that
chatbots could help save employee time by reducing time the staff spends answering
repetitive inquiries. For example, one respondent (female, Millennial, Business Services)
wrote that a chatbot “frees up staff time to handle real issues,” while a second respondent
(female, Millennial, Admissions) wrote “Many students have the same basic questions
that could be answered by this program, which would free up human staff members to
answer the most complex questions.” This was reiterated by two more respondents, who
emphasized that chatbots could decrease traffic generated by repetitive questions. For
example, one respondent (female, Generation Z, Admissions), wrote “We receive the
same questions over and over again and these common questions could be easily
answered by technology like this,” while another (male, Millennial, Admissions) wrote
“It would be able to quicken response time for students with simple issues and reduce the amount of strain on faculty/staff due to that large volume of simple issues.” In addition to saving time for staff, one respondent (female, Millennial, Business Services) also referenced the potential benefit to understaffed offices, writing “Our department is short staffed. Having a chatbot would weed out simple questions with simple solutions so staff can assist real issues.”

This selection of responses in the staff subsection was more demographically varied, with four female and one male respondent, four Millennials and one Generation Z respondent, and three responses from Admissions, with two from Business Services. Although no additional information was provided, one final pro-chatbot respondent (male, Generation Z, Admissions), wrote “Make chatbots campus-wide.”

Chatbot concerns. While many of the narrative responses indicated the respondent’s support of a chatbot, others were concerned about the prospect. In coding these responses thematically, the researcher identified three main areas of concern: the effort required to establish the system, a potential lack of student interest, and concerns that the current system would not be improved by the addition of a chatbot.

The first subtheme detected pertained to concerns over the efforts to successfully build and implement a chatbot, issues that affect the staff, rather than the students. One respondent (female, Millennial, Admissions) wrote “My department has so many different roles/responsibilities that it might be difficult to set it up to answer each and every question a student might have,” while another respondent (female, Millennial, Admissions), wrote “Extensive training needed.” While some respondents expressed concern regarding issues that would strictly affect the staff, others indicated concerns that
would affect both staff and students. For example, one respondent wrote that students often don’t know how to phrase questions, which may cause frustration (female, Millennial, New Student and Retention Programs) while another wrote that even those who used the chatbot would still contact the office for assistance (female, Generation X, Financial Aid).

One respondent suggested some of the critical information may not be easily conveyed via chatbot, writing “Financial aid is confusing, and context and financial knowledge play a crucial role in answering questions. These are both hard to measure through programs like chatbot” (male, Millennial, Admissions). Demographically, all respondents who expressed concerns over the implementation process were either Millennials or from Generation X. No members of Generation Z identified a concern regarding the implementation and set-up processes.

*Chatbot uncertainty.* While some respondents indicated clear preferences for or against the chatbot, others indicated they had mixed feelings about the concept. The two themes that were detected and coded under uncertainty pertained to the perceived impersonality and potential for nonspecific responses. One respondent (female, Millennial, Admissions) wrote that she believed chatbots were impersonal, but that the students would likely find them helpful, while another wrote “I’m concerned about generic responses” (female, Millennial, Business Services). Another (female, Millennial, Financial Aid) wrote that she would like to see how chatbot options with an emphasis on financial aid had worked at other institutions, adding “It may be something that would work well for a department like Admissions, where information tends to be more general than in Financial Aid or Business Services, where information is often very student-
specific.” Although there were only three responses thematically coded under chatbot uncertainty, all three were provided by Millennial females, although they work in three different departments: Admissions, Business Services, and Financial Aid.

*Chatbot conceptual confusion.* A fourth portion of the population did not expressly convey their direct support or opposition of chatbots, instead, their responses indicated some confusion over the functionality of the concept. These were not coded with the responses indicating direct uncertainty because the researcher determined that there were key components of the responses that implied the respondent was not knowledgeable enough to provide an informed answer. One respondent (male, Generation Z, Admissions), stated that “Some students may view it as spam” while another respondent (male, Millennial, Admissions), wrote “It would depend on who would be answering the chatbot considering the volume of calls that are received.” A third respondent (female, Millennial, New Student and Retention Programs) wrote that a chatbot “might be effective, but keeping up with current phone numbers for students can be difficult.” A fourth (female, Millennial, Admissions) was in favor of discussing a possible implementation, but also noted “it would be hard to relay delicate information through a chatbot and could easily be sent to the wrong person and could potentially put the student at risk.”

These four answers indicate that some respondents do not fully comprehend that chatbots are not manually answered by a human and that they are not messages sent via a standard text message platform assigned to a phone number, rather that chatbot responses function as any personalized smartphone app. Although some users may initially view the chatbot as spam, it could be marketed as an extension of the institution’s current CRM. In
future research, more chatbot examples may help alleviate some of the concerns regarding system functionality.

**Descriptive analysis of former student responses.**

The former student population was less responsive to the text-based questions; however, this population did provide varied responses. After reading all of the text-based responses, the researcher coded them into the same overarching themes as the staff responses: pro-chatbot, concerns about chatbots, chatbot uncertainty, and conceptual confusion. Within each of these sections, the responses were further coded thematically to provide more clear representation of the responses.

**Chatbot favorability.** While multiple former students surveyed for this research expressed their support for the concept of a chatbot, they were less likely to provide a specific justification for their answer than the staff respondents. Through the analysis process, the researcher identified three themes that emerged from the pro-chatbot text-based responses: improving communication, saving time/decreasing wait time, and a general benefit classification which includes pro-chatbot responses that did not specifically address a particular benefit or benefits.

Only one student respondent (female, Generation Z) suggested that chatbots would improve the communication process, writing “It would make communication more efficient.” Another respondent (female, Generation Z) wrote of her support for chatbots and provided a short list of three reasons: “1. 24 hour assistance needed. 2. I love chatbots for companies I tend to get a response faster than the telephone. 3. It also eliminated calling fees or prepaid minute usage” while another respondent (male, Generation Z) wrote “Chatbot would also save time,” but did not elaborate further. These
are the only three responses from former students that provided specific benefits pertaining to the chatbot concept.

In addition to the answers that provided specific justifications for support, responses from four students were classified into a general benefit. One respondent (female, Generation X) in response to the question *If a chatbot was offered by a college/university, how would that change your perception of the institution?* wrote “I believe it would benefit, and I wouldn’t think less of USM either way. It’s a great university.” Similarly, another respondent (female, Generation Z) wrote “It would be very helpful” but did not elaborate further.

One response that conveyed support for the chatbot indicated the student (female, Generation X) had experience with a chatbot, writing “I think this is a great idea. The community college had one and it’s excellent.” Another respondent (female, Generation Z) provided her suggestions for a chatbot. She wrote “I think this is a great idea. If the chatbot idea would become an app, be on a usm [sic] website, and have kiosks in the financial aid business, the business center, and the library. It could even have preset questions, commonly asked questions and a textbox for your questions.”

*Chatbot concerns.* While many of the narrative responses indicated support of a chatbot, other student respondents were concerned about the prospect. In coding these responses thematically, the researcher identified two main areas of concern: a preference for human interaction and a disdain for chatbots and artificial intelligence. Three respondents noted their preference for communicating with humans. One respondent (male, Baby Boomer) also referenced their concerns regarding artificial intelligence and
the job market, writing “I prefer speaking to humans. And I find that any type of robotic system is bad for the job market.”

Two other former students indicated that they support chatbots, but only for use in limited circumstances. For example, one (male, Millennial) wrote “I strongly believe a chatbot would only be helpful in the enrollment process. After that, when things start to get more ‘real’ you need a real life person to listen. Especially since I think everyone’s situation is a little bit different.” This comment was reiterated by another respondent (female, Generation Z), who wrote “Sometimes students have unique situations with financial aid and I can see a lot of frustration when trying to talk to a robot that only gives automated response and helps a student personally.”

Another portion of former students who expressed concern regarding the concept were classified as general opposition, since their dissent did not provide a specific reason or reasons. Among those responses were “I don’t support AI” (male, Generation Z) and “I would hate it!” (female, Baby Boomer). A third respondent (male, Millennial) suggested better staffing would resolve the same issues that a chatbot could address, writing “The best thing you can do is forget the chatbots and just hire better people. The absolute worst thing is to have to speak to a robot. We ALL just want to understand the context of what we’re saying. The whole chatbot thing is a terrible idea. Honestly.”

Chatbot uncertainty. Unlike the staff population, only one text-based response from a student was classified as uncertain. That respondent (female, Generation Z), wrote “I would just make sure it stays up to date with the latest information, and even notify for financial due dates.”
Chatbot conceptual confusion. The fourth response theme included a comment from a former student that was not coded as directly supporting or rejecting chatbots, since the comment indicated conceptual confusion. The single response was not coded with direct uncertainty because there were key components that implied the respondent was not informed enough to provide a valid answer. This respondent (female, Generation Z) wrote

There would still need to be a way to keep the human interaction involved. It may seem like the convenience is actually thoughtful, but if there is no real life behind it then things could get a bit out of control. Will there be specific times for a student to relay messages to the chatbot? How will the chatbot communicate the student’s information thoroughly? Will the information sent through text messages be generic? Will the responses to messages happen as quickly as real text message or will there be a delay like real text messages as well? If so, how long? Who is actually going to be over getting the information into such a unique system and responding accurately to each individual student? Will chatbot be for every student or a certain classification? What happens when students do not have a mobile device to utilize, will there be an application for chatbot?

This respondent, while posing some pertinent questions in her response, does not seem to understand that chatbots are accessible 24-hours per day, 365 days per year, that the information will not be generic, and that the system finds the answer, rather than an individual human. It should be noted that the student did posit a question about accessibility for students who do not have access to a smartphone. Although we often assume that all people have one, that is not always the case.
Summation of Findings

*Descriptive analysis summary.*

The descriptive analyses detailed above highlight some themes that emerged from both populations. Although these are not generalizable, the overarching themes that emerged provide some interesting insight on the descriptive data collected during this research, as many questions allowed participants an open forum to respond. Some key notes pertained to direct opposition to the chatbot concept, with students conveying more direct opposition, including a negative response from the single Baby Boomer (male) who completed the text-based questions. Also, when evaluating based on respondent generation, only one response indicating concern was received by a Generation Z respondent (female, former student). Similarly, all three of the positive responses from students were from Generation Z respondents (two females, one male). When evaluating staff responses, opposition or uncertainty regarding the chatbot were posed by respondents from all four departments: Admissions, Business Services, Financial Aid, and New Student and Retention Programs.

*Quantitative analysis summary.*

There were several trends that emerged when evaluating the quantitative data collectively. One trend that emerged was a preference in favor of chatbots for younger respondents. When former student respondents were asked if they would use a chatbot to communicate with the Financial Aid and Business Services office, a majority of Generation Z, Millennials, and Generation X respondents indicated they would use the system. When evaluating the proposed business services chatbot. While the business services chatbot yielded the same results, there were differences in the Millennial and
Generation X numerical responses in the *very effective* and *effective* columns. One finding that is noteworthy is that both questions reflected a higher percentage of Generation X respondents’ favorability of chatbots when compared to Millennials. Prior to this research, it was expected there would be a direct correlation between an increase in age and a decreased favorability towards this emerging technology. Further research could address this finding. The only anomaly in this trend was the STAFFBENEFIT question, which found that 100% of Generation Z, 93.3% of Millennials, 33% of Generation X, and zero percent of Baby Boomer respondents indicated that they believe a chatbot would benefit the staff.

Other findings from the staff survey revealed that 61.9% said a business services chatbot was *very effective* or *effective*, compared to just 57.1% who said the same about a financial aid chatbot. By department, it was clear that Admissions employees were most favorable towards the business services chatbot concept, with 81% saying it was *very effective* or *effective*, compared to 50% of business services employees. This finding is unexpected, since respondents from departments other than Business Services found the concept to be more effective. Additionally, there were no financial aid employees who felt the business services chatbot would be *very effective*, another surprising finding, especially considering the overlap in many of those offices’ responsibilities. Similarly, no financial aid employees thought the proposed financial aid chatbot would be *very effective*, although 20% of that population subset felt it would be *effective*. While financial aid employees were less favorable to a financial aid chatbot, 72.7% of the Admissions respondents felt it would be *very effective* or *effective*, while 50% of Business Services and 66.67% of New Student and Retention Programs employees agreed.
Evaluating the data from the former student surveys also led to the emergence of some trends. For example, respondents who reported earning less than $40,000 per year found the business services concept more effective. These numbers remained relatively stagnant as income levels increased until a small increase for those who reported earning more than $100,000, a trend that was similar when evaluating the perceptions of the financial aid chatbot.

In addition to collecting information about perceptions of the chatbot as a prototype, this research also sought feedback from former students on how a chatbot implemented by USM would affect their perception of the institution. The results of this research indicate that students believe both financial aid and business services chatbots are effective, but they remain neutral on whether the implementation of such a system would affect their perception of the institution. More than half of the former students surveyed, 62%, said USM implementing a chatbot would not affect their decision to return to the institution, while 15% said it would make them more likely to reenroll. Although a chatbot may not influence most former students’ decision to reenroll, this research also found that 45.2% of that population and more than half of Millennials and Generation Z respondents said the addition of a chatbot to a college or university would raise their perception of that institution.

Discussion and Interpretations

After reviewing the data and the trends that emerged, this research found that respondents are generally favorable towards the introduction of chatbots to aid in the communication process. While certain subsets of the population were slightly more favorable, this research provides a solid indication that a chatbot would be a positive
addition at USM. As the first body of research conducted on this topic and with these populations, this research serves as an example for further investigation to build on the findings reported above. Although this research was conducted on a specific and small population, there are some interpretations that can be derived from the findings.

_A greater preference for a business services chatbot._

One trend that emerged was a slightly higher favorability for a business services chatbot than a financial aid chatbot. While some students do not apply for financial aid, all students receive a bill from the institution, which may explain the preference for a business services chatbot. Based on this notion, it would be logical that a greater percentage of students had interactions with business services, since financial aid applications are optional, but the billing process is automatic.

_The lower income students have higher favorability for a financial aid chatbot._

It is understandable to find the connection between a student’s income level and their preference for a financial aid chatbot. Although financial aid includes gift, merit, and loan-based aid, students with fewer financial resources are often more likely to need aid. Although this explains the lowest income ranges having a higher perceived efficiency of a financial aid chatbot, it fails to explain the uptick that occurred for students reporting an annual income of more than $100,000. This same trend occurred when the business services chatbot example was posed as an option. Although this remains open to interpretation, this could provide an opportunity for future research.

_Generation X vs. Millennials: Is Gen. X more tech-savvy?_

In the questions that addressed former student perceptions of financial aid and business services chatbots, higher percentages of Generation X respondents reported the
concepts to be more effective than Millennial respondents. Although it is easy to assume that Millennials are more tech-savvy, this body of research found that Generation X students would find a chatbot more efficient than their younger Millennial counterparts. Although neither group was as pro-chatbot as Generation Z or as anti-chatbot as the Baby Boomers, this finding could potentially be examined in future research.

Implications for Higher Education Professionals

Chatbots have only begun to be successfully implemented into higher education; therefore, there is much unchartered territory pertaining to their implementation and use. The decision to consider and implement chatbots is one that many institutions will likely undertake in future years as the technology advances and the funding for higher education continues to decline or stagnate, forcing more institutions to use technology to best serve students.

At the institutional level, USM President Rodney D. Bennett discussed the concept of chatbots at a university-wide forum in late 2018. While this research is not linked to that statement, it is the hope of the researcher that this project will provide an initial basis for the institution as it considers if – and how – this technology could be used to improve student support. It is the belief of the researcher that this study could help facilitate a dialogue about the use of a chatbot of USM; however, since this research is not generalizable, it is pertinent that future research builds on this topic.

On a smaller scale, the populations surveyed through this research may provide unique insight into the individual concerns and questions that still surround the use of chatbots and artificial intelligence as a customer relationship tool. Based on the descriptive responses, there are lingering concerns regarding the functionality of a
chatbot with this population. Again, this makes the decision to conduct further research at USM on chatbot viability a necessity.

Recommendations for Future Research

*Provide better chatbot depictions.*

The qualitative data collected in this survey indicated there were still unclear expectations about the role and functionality over what the chatbot would do and how it would work. For example, one respondent expressed concern over who would be responding to students who inquired via the chatbot, while another claimed that it would be hard to communicate with students who have constantly changing phone numbers. Both of these statements indicate that there may be some residual confusion about how chatbots work. These responses indicate that some respondents were unclear about the functionality, thus, this uncertainty may have potentially skewed the researcher’s findings.

*Expand to new populations.*

Since the chatbot depicted in this research was a concept specifically designed to assist students with financial aid and business services inquiries, this research was tailored to specific student-facing units at The University of Southern Mississippi: the Office of Admissions, Business Services, the Office of Financial Aid, and New Student and Retention Programs. These units were selected for this initial research because of the role each unit plays in either the financial wellbeing of the student population or the recruitment and retention of students at the institution. Future researchers would be advised to expand the research to other student-facing units on campus.
Similarly, the researcher solicited survey responses from a specific subset of students, those who did not return for the 2017-2018 academic year after being enrolled for the 2016-2017 academic year, excluding those who graduated. This population encapsulates one year of student attrition, and it would be advisable to recreate this research for future students. Additionally, though it was not the researcher’s intention to solicit any feedback from current students, future researchers may conduct a similar study on currently enrolled students to gather their impressions about chatbot implementation at the institution.

Restructure surveys to same population.

Upon reflection, the researcher noted that it would be pertinent to ask additional questions to these populations, should this research ever be replicated. Statistical analysis on the quantitative data revealed that there were some questions that should have been included in the survey. For example, in reviewing the enrollment management staff survey, it would have been helpful to know how long the respondent had served in his or her position, since the perspective of an employee who has been in the position for six months may vary greatly from another employee who has worked in the position for several years.

The researcher should have condensed many sections of both surveys to limit survey fatigue. This became apparent during the data analysis process, when many questions were discarded. It would be advantageous for future researchers to streamline the process to ensure the portion of the survey pertaining to the chatbot was moved up, since many of the respondents who began the survey did not complete it.

Conclusion

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Despite efforts to improve retention, USM still experiences a high level of student attrition. In the Fall 2016 semester, 28.53% of full-time first-time freshman did not return for a second year, a number that has remained stagnant since Fall 2003, according to USM’s Office of Institutional Research. While the root of this research focused on how a chatbot focused on financial information was perceived by the selected populations, there was an underlying emphasis on impression of how a chatbot could improve student retention at the institution. While this research indicates a chatbot would not affect retention at the institution, it provides the formation of a dialogue of perceptions from two key groups of stakeholders that should be considered should the institution elect to implement a chatbot.

While this research does not to suggest that a chatbot is the only solution, or perhaps even a viable option, it should serve as a basis for future research. As future generations of technologically-savvy students arrive on campus, higher education professionals must remain vigilant to serving the students at their level, even if that level is not run by humans, but by machines.
Hi Emma, welcome to Georgia State! I'm Pounce, your virtual guide to help you enroll. Ask me anything about GSU.

How much is it to reserve my spot?

There's no enrollment fee, but if you want to live on campus a $350 deposit is due with your housing application.

Got it, thanks

(Dalton, 2018)
APPENDIX B – Sample Outreach Campaign

This information is derived text message outreach campaign from *Summer Melt: Supporting Low Income Students Through the Transition to College*, by Benjamin L. Castleman and Lindsay C. Page.

MESSAGE PURPOSE: Introductory message

**GENERIC MESSAGE TO STUDENT:**

Hi [STUDENT’S NAME] this is [PROMINENT PERSON]. We want to help you with college. Stay tuned for key summer to-dos. Save this #, you can text us for help!

**GENERIC MESSAGE TO PARENT:**

Hi [STUDENT’S NAME] this is [PROMINENT PERSON]. We want to help [STUDENT NAME] with college! Stay tuned for key summer to-dos. Save this #, you can text for help.

1. MESSAGE PURPOSE: Have student log on to their web portals

**GENERIC MESSAGE TO STUDENT:**


**GENERIC MESSAGE TO PARENT:**


2. MESSAGE PURPOSE: Have students ask questions about FAFSA or financial aid award letter
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GENERIC MESSAGE TO STUDENT:

Hi [STUDENT’S NAME] Need help with the FAFSA? Questions about your fin. aid award letter, or need more aid? Reply MTG to meet with a financial aid counselor.

GENERIC MESSAGE TO PARENT:

Does [STUDENT’S NAME] need help with the FAFSA? Questions about the fin. aid award letter, or need more aid? Reply MTG to meet with a financial aid counselor.

3. MESSAGE PURPOSE: Have students sign up for orientation

GENERIC MESSAGE TO STUDENT:

Hi [STUDENT’S NAME]! Have you signed up for the New Student Orientation? Last one is [FN ORIEN]. Need to register? [TINYURL REGI PAGE] Need help? Reply MTG to talk with an admissions counselor.

GENERIC MESSAGE TO PARENT:


4. MESSAGE PURPOSE: Inquire whether students’ college plans have changed.

GENERIC MESSAGE TO STUDENT:

Hi [STUDENT’S NAME]! Still planning on attending USM or have your plans changed? Need a plan B? Reply MTG to meet with an admissions counselor.

GENERIC MESSAGE TO PARENT:
Is [STUDENT’S NAME] still planning to attend USM or have their plans changed? Need a plan B? Reply MTG to meet with an admissions counselor.

5. MESSAGE PURPOSE: Reminder about tuition bill release

GENERIC MESSAGE TO STUDENT:

Hi [STUDENT’S NAME]! The USM tuition bill is coming soon! Need info about tuition payments? [TINYURL CUSTOMIZED TO USM PAYMENT PAGE]

Need help with the bill? Reply MTG to this msg.

GENERIC MESSAGE TO PARENT:

Hi [PARENT’S NAME]! The USM tuition bill is coming soon! Need info about tuition payments? [TINYURL CUSTOMIZED TO USM PAYMENT PAGE]

Need help with the bill? Reply MTG to this msg.

6. MESSAGE PURPOSE: Have students take placement tests

GENERIC MESSAGE TO STUDENT:

Hi [STUDENT’S NAME]! Remember to take the Accuplacer placement tests.

Need info? [TINYURL PLACEMENT] Need help? Reply MTG to this msg.

GENERIC MESSAGE TO PARENT:


7. MESSAGE PURPOSE: Let students know they may be required to have health insurance

GENERIC MESSAGE TO STUDENT:
Hi [STUDENT’S NAME]! USM may require you to have health insurance. Need info on health care options/costs? [TINYURL CUSTOMIZED TO USM HEALTH CARE PAGE] Need help? Reply MTG.

**GENERIC MESSAGE TO PARENT:**

[STUDENT’S NAME] may be required to have health insurance at USM. Need info on health care options/costs? [TINYURL CUSTOMIZED TO USM HEALTH CARE PAGE] Need help? Reply MTG.

**8. MESSAGE PURPOSE: Check in text**

**GENERIC MESSAGE TO STUDENT:**

How’s the college planning going? Need help with anything? Reply MTG. For info on key tasks to complete: soar.usm.edu

**GENERIC MESSAGE TO PARENT:**

Hi [PARENT’S NAME]! How’s [STUDENT NAME]’s college planning going. Need help with anything? Reply MTG. For info on key tasks to complete:

soar.usm.edu

**9. MESSAGE PURPOSE: Reminder about tuition bills**

**GENERIC MESSAGE TO STUDENT:**

Hi! The USM tuition bull is due [TUIT DUE]. Need info about tuition payment options? [TINYURL TUITIONPG] Need help with the bill? Reply MTG.

**GENERIC MESSAGE TO PARENT:**

Hi! The USM tuition bull is due [TUIT DUE]. Need info about tuition payment options? [TINYURL TUITIONPG] Need help with the bill?
10. MESSAGE PURPOSE: reminder about the first day of the semester and move-in date

GENERIC MESSAGE TO STUDENT:
Hi [STUDENT’S NAME]! Can you believe the first day of classes at USM is [1st DAY CLASS] and move-in day is [MOVE-IN]?! We hope you have a great year!

GENERIC MESSAGE TO STUDENT IF THERE IS NO MOVE-IN DATE:
Hi [STUDENT’S NAME]! Can you believe the first day of classes at USM is [1st DAY CLASS]?! We hope you have a great year!

GENERIC MESSAGE TO PARENT:
Can you believe [STUDENT NAME]’s first day of classes at USM is [1st DAY CLASS] and move-in day is [MOVE-IN]?! We hope [STUDENT NAME] has a great year!

GENERIC MESSAGE TO PARENT IF THERE IS NO MOVE-IN DATE:
Can you believe [STUDENT NAME]’s first day of classes at USM is [1st DAY CLASS]?! We hope [STUDENT NAME] has a great year!
(Sawers, 2019)
APPENDIX D – Staffordshire University Beacon Screenshots

(Sawers, 2019)
APPENDIX E – Mississippi Institutions of Higher Learning (IHL) Student Registration Guide

The field indicates the student’s registration type for the current registration period, utilizing the following definitions:

**First-time Freshman:** A student who has never attended a college or university; or (2) a student who has previously attended any college or university for the first time in the prior summer term; or (3) a recent high school graduate who graduated in May and enrolled the following Fall term (regardless of summer enrollment); or (4) a student who successfully completed the twelve hour Summer Developmental Program regardless of the institution attended; or (5) a student with advanced standing (AP, CLEP or college credits earned before high school graduation). As a general rule, recent high school graduates who enroll in the fall term after graduation should be counted as first-time freshmen, regardless of their academic activity between graduation and their fall enrollment. Students who skip the fall term and enter in the spring are still considered to be first-time freshmen if they have not attended another postsecondary institution. However, students who skip the fall and enroll in the spring with any prior coursework after high school are considered to be first-time transfers. Note: Starting with the Summer 2009 term, the 12-hour requirement for first-time freshmen has been omitted in order to meet IPEDS criteria. Prior to that time first-time entering freshmen could not have more than 12 hours.

*Unusual Examples of First-time Freshman:* A student completes the 9-week *Summer Developmental Program at DSU and enrolls at JSU the following fall*
term. The student would be a first-time freshman at JSU. All Summer Developmental Program students are to be coded as first-time freshmen regardless of institution attended. A student graduates from Biloxi high school in May, earns 6 AP hours, takes 12 credit hours at Gulf Coast Community College the following summer, and enrolls at USM-Gulf Coast the following fall. The student would be a first-time freshman at USM. A student graduates from Biloxi high school in May, takes 9 credit hours at Gulf Coast Community College the following summer, and enrolls at USM-Gulf Coast the following spring term (he or she skips the fall term to work). The student would be a first-time transfer at USM. A student graduates from Tupelo high school in May, earns 15 AP hours, takes 15 credit hours at Northwest Community College the following summer, and enrolls at UM the following fall. The student would be a first-time freshman at UM (but have a sophomore academic level)

**Returning Undergraduate Student:** An undergraduate student who was registered at this institution during the preceding regular term (e.g. Fall or Spring) and would not be classified as a first-time freshman (See above).

**Readmitted Student:** An undergraduate student who previously attended this institution but did not attend this institution during the previous regular term (e.g., Fall or Spring).

**First-Time Transfer Student:** An undergraduate student entering the reporting institution for the first time who previously attended another postsecondary institution--exceptions include the first-time freshmen criteria outlined above. These students may or may not have transfer credit hours. Starting in Summer
2015, a student considered to be a first-time transfer student in the summer term should also be considered a first-time transfer student in the fall term (just as summer first-time freshmen are also first-time freshmen in the fall).

*Unusual Examples of First-time Transfers:* A student attends Gulf Coast Community College as an entering freshman during the fall term and enrolls in 12 hours, but he or she is unable to complete the semester because of a medical hardship. When the student enrolls at USM the following spring term, he or she is a first-time transfer student despite having no transferable hours (previously attended institution). A student graduates from Biloxi high school in May, takes 9 credit hours at Gulf Coast Community College the following summer, and enrolls at USM-Gulf Coast the following spring term (he or she skips the fall term to work). The student would be a first-time transfer at USM.

**Returning or Transfer Graduate Student:** A student who is enrolled for credit for work creditable toward a graduate degree, i.e., master’s, specialist, or doctorate, and was previously registered as a graduate student at the reporting institution or another institution.

**First-Professional Student:** A student who is enrolled for work creditable toward a Professional degree (law, dentistry, medicine).

**Transient Student:** A student who is regularly enrolled and in good standing at an institution other than the reporting institution and is taking a course or courses at the reporting institution which he/she intends to transfer to his/her regular institution. These students are generally non-degree students, but they are enrolled.
at another postsecondary institution and plan to transfer their completed course work to that institution.

**High School Student Taking College Courses:** A student who is still in high school but has special permission to take a college level course. High school students dually taking college courses should be coded here regardless of other applicable coding or circumstances.

**Non-Formula Students 21 and Over:** A student who is currently registered under provisions of original admission code of 6 on data element 04-310.

**First-time Graduate Student:** A new graduate student. One who has not been registered previously as a graduate student.

**Other:** A student who is not classified in any one of the other categories. This may include non-degree students who do not have an academic degree taking courses such as walking, fitness, etc.

**Summer Developmental Program Participant:** A student enrolled in the Summer Developmental Program. Valid in summer term only. The number of summer program students reported in the summer file should match the number of students reported in summer program spreadsheets.

**Returning Post Baccalaureate:** A student who has already earned his or her baccalaureate degree (from any institution) and is taking additional undergraduate or graduate courses to continue his or her education. This is typically a non-degree student who is not enrolled in an academic program. This may include faculty and staff taking courses for lifelong learning.

**Complete To Compete – Readmitted Student:** A former undergraduate student who
has gained readmission under the terms of the Complete to Compete initiative.

**Complete To Compete – First-time Transfer Student:** An undergraduate student entering the reporting institution for the first time who previously attended another postsecondary institution and gained admission under the terms of the Complete to Complete initiative.
APPENDIX F – Mississippi Institutions of Higher Learning (IHL) Academic Level Guide

A code to denote the traditional academic level of the student. For undergraduates, this is based upon the number of semester credit hours successfully completed and earned. For graduate students, this is based upon the level of degree which the student is pursuing. This should include applicable transfers hours, CLEP or AP hours, or any other hours that would otherwise contribute to a student’s academic level.

**Freshman:** A student completing less than the equivalent of one year of undergraduate work; less than 30 credit hours. (NOTE: Prior to Academic Year 2002 Freshman A - Student has completed fewer than 12 semester hours. Freshman B - Student has completed at least 12 semester hours, but fewer than 27 semester hours.)

**Sophomore:** A student completing the equivalent of one year of undergraduate work; at least 30 credit hours but less than 60 credit hours. (NOTE: Prior to Academic Year 2002 - Student has completed at least 27 semester hours, but fewer than 54 semester hours.)

**Junior:** A student completing the equivalent of two years of undergraduate work; at least 60 credit hours but less than 90 credit hours. (NOTE: Prior to Academic Year 2002 - Student has completed at least 54 semester hours, but fewer than 87 semester hours.)

**Senior:** A student completing the equivalent of three years of undergraduate work; at least 90 credit hours, but has not completed all the requirements for the undergraduate degree for which he/she is currently enrolled. (NOTE: Prior to Academic Year 2002 - Student has completed at least 87 semester hours.)
Hello,

On October 1, you were sent an email to provide feedback on your financial aid and business services experience at The University of Southern Mississippi. The survey also asked you to review a prototype for an artificial intelligence-based chatbot that could be implemented to assist students in receiving information about their student aid. As a doctoral candidate using this research to complete my dissertation research, I am kindly asking you to complete the online survey available at https://tinyurl.com/enrollmentstaff.

Once you’ve completed the survey and entered your email address, you will be entered into a drawing to receive a Starbucks Gift Card. Please complete this survey at your earliest convenience.

Thank you,

Courtney Robinson, M.Ed.
Courtney.L.Robinson@usm.edu
Doctoral Candidate
Higher Education Administration
The University of Southern Mississippi
Hello,

On November 13, you were sent an email to provide feedback on your financial aid and business services experience at The University of Southern Mississippi. The survey also asked you to review a prototype for an artificial intelligence-based chatbot that could be implemented to assist students in receiving information about their student aid. As a doctoral candidate using this research to complete my dissertation research, I am kindly asking you to complete the online survey available at https://tinyurl.com/USMstudentsurvey.

Once you’ve completed the survey and entered your email address, you will be entered into a drawing to receive an Amazon Gift Card. Please complete this survey at your earliest convenience.

Thank you,

Courtney Robinson, M.Ed.
Courtney.L.Robinson@usm.edu
Doctoral Candidate
Higher Education Administration
The University of Southern Mississippi
APPENDIX I – Survey Instrument for Former Students

Biographical Questions

Sex (Dropdown menu):

➢ Male
➢ Female
➢ Prefer not to respond

What is your year of birth? (Enter four-digit year)

Please identify your race/ethnicity (Select all that apply):

○ Asian-American
○ Black/African-American
○ Hispanic
○ Native American
○ Pacific Islander
○ White/Caucasian
○ Two or more races
○ Prefer not to respond

Annual Household Income (Dropdown menu):

➢ Less than $20,000
➢ $20,000-$29,999
➢ $30,000-$39,999
➢ $40,000-$49,999
➢ $50,000-$59,999
➢ $60,000-$69,999
$70,000-$79,999
$80,000-$89,999
$90,000-$99,999
Greater than $100,000
Unknown
Prefer not to respond

Residency (Dropdown menu)

Mississippi Resident (Dropdown menu to select county)
Non-Mississippi Resident (Dropdown menu to select state)
Non-U.S. Resident

Your Student Experience at The University of Southern Mississippi

1. What was your status at the time you entered USM? (Select one):
   - First-time freshman (Graduated from high school within last calendar year)
   - Community college transfer
   - Transfer from four-year institution
   - Adult student (Never previously enrolled, but did not graduate from high school in most recent calendar year)
   - Unsure
   - Prefer not to respond

2. How many semesters did you complete at USM prior to leaving the institution?
   - Less than one full semester
   - Completed one full semester
   - Less than two full semesters
Completed two full semesters
Less than three full semesters
Completed three full semesters
Less than four full semesters
Completed four full semesters
Less than five full semesters
Completed five full semesters
Less than six full semesters
Completed six full semesters
Completed more than six full semesters

3. What was your status during your last semester at USM?
   - First year
   - Second year
   - Third year
   - Fourth year
   - Fifth year
   - Sixth year
   - Unsure

4. Why did you stop attending The University of Southern Mississippi? (Select any/all that apply):
   - I transferred to an institution closer to home.
     Please enter institution name: ________________________________
   - I transferred to an institution that had a better academic program for my goals.
Please enter institution name: 

○ I had a problem or problems with my academic experience at Southern Miss:
  ○ I had poor grades.
  ○ I experienced challenges with a professor or professors.
  ○ I was concerned with the grades I was earning and withdrew in the middle of the semester.

○ I had a personal problem (Select any/all that apply):
  ○ I had a problem with a roommate.
  ○ I felt like I didn’t fit it at Southern Miss.
  ○ I was homesick and wanted to be closer to family.
  ○ I had to leave to work more hours to support myself or my family.
  ○ I changed my career plans and USM was no longer a good fit for me.
  ○ Other: 

○ I had problems with my finances (Select any/all that apply):
  ○ I received financial aid, but could not afford the out-of-pocket expense.
  ○ I expected to be eligible for more grants and scholarships, but I was not.
  ○ I was only awarded loans, and I didn’t want to borrow to pay for school.
  ○ I did not believe I was eligible for aid, therefore, I did not apply.
  ○ I planned to pay out of pocket, but the bill was higher than I expected.
  ○ I received less financial aid than I expected.
  ○ I had problems during the financial aid application process, and I could not receive the assistance I needed.
  ○ Other: 

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o I stopped attending USM and did not transfer elsewhere for the following reason(s) (Select all that apply):
  o I felt that I was not ready to attend any college
  o I dropped out to help support my family financially.
  o I could not afford to attend any college, but plan to return later.
  o I could not afford to attend any college and do not plan to return later.
  o I chose a new career path that does not require a college education.
  o Other: __________________________________________________________

Financial Aid Questions

5. Did you experience challenges with the **financial aid process** as a student at The University of Southern Mississippi?
   ➢ Yes
   ➢ No
     ➢ No, because I did not apply for financial aid
     ➢ Unsure

6. If you responded “Yes,” please select the reason(s):
   o I could not find helpful information online.
   o The information I found online was not current.
   o I started the financial aid application process, but did not finish.
   o I had unresolved financial aid questions I could not get answered by the staff.
   o I completed the application process, but did not receive the aid I expected.
   o I could not understand how my aid was calculated.
   o I could not understand my award notification letter.
o I was selected for verification, but couldn’t provide the necessary
documentation.

o I could not get the verification documentation I needed before the deadline.

o Other:________________________________________________________

7. Did you communicate at least one time with the **Financial Aid Office** via **phone**?
   ➢ Yes
   ➢ No
   ➢ Unsure

8. Was your question answered during your **first phone call**?
   ➢ Yes
   ➢ No
   ➢ Unsure

9. If you answered “No,” please select the reason(s).
   o When I called the **Financial Aid Office**, there was no answer.
   o When I called the **Financial Aid Office**, I did not understand the answer.
   o When I called the **Financial Aid Office**, I was told I would not receive the
     financial aid I expected.
   o When I called the **Financial Aid Office**, I received poor service.
   o It took more than one phone call, but my question was resolved.
     ▪ How many phone calls did you make to resolve your question:
     ____________________________________________________
   o I exchanged multiple phone calls with the **Financial Aid Office**, but my
     question was never resolved.
• Please enter the number of phone calls you made, even though your question was not resolved:

________________________________________________________________________________

10. How would you rate the assistance you received from the Financial Aid Office via phone?

➢ Excellent
➢ Good
➢ Neutral
➢ Poor
➢ Unsure

11. Did you communicate at least one time with the Financial Aid Office via email?

➢ Yes
➢ No
➢ Unsure

12. Was your question resolved after your initial email to the Financial Aid Office?

➢ Yes
➢ No
➢ Unsure

13. If you answered “No,” please select the reason(s).

➢ When I emailed the Financial Aid Office I did not receive a response.
➢ When I emailed the Financial Aid Office, I did not understand the response.
➢ When I emailed the Financial Aid Office, I received a rude response.
➢ It took more than one email, but my issue was resolved.
How many emails did you have to send to resolve your question:

I exchanged multiple emails with the Financial Aid Office, but my question was never resolved.

How many emails did you exchange, even though your question was unresolved:

14. How would you rate the assistance you received from the Financial Aid Office via email?

- Excellent
- Good
- Neutral
- Poor
- Unsure

Business Services Questions

15. Did you experience challenges with the billing process as a student at The University of Southern Mississippi?

- Yes
- No
- Unsure

16. If you responded “Yes,” please select the reasons(s):

- I could not find helpful information online.
- The information I found online was not current.
I had unresolved business services questions I could not get answered by the staff.

I could not understand my bill.

I believe I was billed incorrectly.

I expected that my financial aid, including grants, scholarships, and loans, would cover more than it did.

I received all of the information I needed, but I was dissatisfied with poor service from the staff.

Please describe any challenges not listed above (short answer space provided).

---

17. Did you communicate at least one time with Business Services via phone?

➢ Yes
➢ No
➢ Unsure

18. Was your issue resolved during your phone call?

➢ Yes
➢ No
➢ Unsure

19. If you answered “No,” please select the reason(s).

➢ When I called Business Services, there was no answer.
➢ When I called Business Services, I did not understand the response.
➢ When I called Business Services, I received poor service.
➢ When I called Business Services, I did not like the information I received.
o It took more than one phone call, but my question was resolved.
  ▪ How many phone calls did you make to resolve your question:

  __________________________________________________________

o I exchanged multiple phone calls with Business Services, but my question was never resolved.
  ▪ How many phone calls did you exchange, even though your question was not resolved:

  __________________________________________________________

20. How would you rate the assistance you received from Business Services via phone?
  ➢ Excellent
  ➢ Good
  ➢ Neutral
  ➢ Poor
  ➢ Unsure

21. Did you communicate at least one time with Business Services via email?
  ➢ Yes
  ➢ No
  ➢ Unsure

22. Was your question answered after your initial email to Business Services?
  ➢ Yes
  ➢ No
  ➢ Unsure

23. If you answered “No,” please select the reason(s).
o When I emailed **Business Services**, I did not receive a response.

o When I emailed **Business Services**, I did not understand the response.

o When I emailed **Business Services**, I received a rude response.

o It took more than one email, but my question was resolved.

  ▪ How many emails did you send to resolve your question?

  __________________________________________

➢ I exchanged multiple emails with **Business Services**, but my question was never resolved.

  ▪ How many emails did you exchange, even though your question was unresolved:

  __________________________________________

24. How would you rate the assistance you received from **Business Services** via **email**?

  ➢ Excellent
  ➢ Good
  ➢ Neutral
  ➢ Poor
  ➢ Unsure

_Southern Miss Communication Plan Questions_

25. How would you rate the communication you received from Southern Miss regarding your **financial aid** account?

  ➢ Excellent
  ➢ Good
  ➢ Neutral
26. How important was the response time from the **Financial Aid Office** on your experience as a student?

- Very Important
- Important
- Neutral
- Not Important
- Not at all Important
- Unsure

27. What is your preferred way to interact with the **Financial Aid Office**? (Rank in order from most preferred to least preferred)

1. Phone call
2. Paper letter
3. Email
4. Text message
5. Other (write-in): ______________________________________________________________________

28. During your time as a student, did you experience any challenges when attempting to communicate with the **Financial Aid Office**?

- Yes
- No
- Unsure
29. If you selected “Yes,” what challenges did you experience when seeking information on your financial aid account? (Select all that apply)
   o Delay in response from staff
   o Unclear instructions from staff
   o Different responses from staff members in the same department
   o Different responses from staff members in different departments
   o Transferring phone call to multiple other departments (Southern Miss Shuffle)
   o Other: ____________________________

30. What do you perceive are the communication challenges for students specifically pertaining to their financial aid accounts? (Select all that apply)
   o Delay in response from staff
   o Unclear information from staff
   o Inconsistent responses from different staff members/departments
   o Transferring of students to another department for assistance (Southern Miss Shuffle)
   o Other: ____________________________

31. How would you rate the communication you received from Southern Miss regarding your business services’ account?
   ➢ Excellent
   ➢ Good
   ➢ Neutral
   ➢ Poor
   ➢ Unsure
32. How important was the response time from Business Services’ on your experience as a student?
- Very Important
- Important
- Neutral
- Not At All Important
- Not Very Important
- Unsure

33. What is your preferred way to interact with Business Services? (Rank in order from most preferred to least preferred)
1. Phone call
2. Paper letter
3. Email
4. Text message
5. Other (write-in):

34. During your time as a student, did you experience any challenges when attempting to communicate with Business Services?
- Yes
- No
- Unsure

35. If you selected “Yes,” what challenges did you experience when seeking information on your business services account? (Select all that apply)
- Delay in response from staff
o Unclear instructions from staff
o Different responses from staff members in the same department
o Inconsistent responses from staff members in different departments
o Transferring phone call to multiple other departments (Southern Miss Shuffle)

36. How would you rate the communication you received from Southern Miss regarding your business services account?

➢ Excellent
➢ Good
➢ Neutral
➢ Poor
➢ Unsure

37. What do you perceive are the communication challenges for students specifically pertaining to their business services account? (Select all that apply)

o Delay in response from staff
o Unclear information from staff
o Inconsistent responses from different staff members/departments
o Receiving incorrect answers
o Transferring of students to another department (Southern Miss Shuffle)

38. How likely are you to return to USM to complete your degree?

➢ Very likely to return
➢ Somewhat likely to return
➢ Equal likelihood of returning/not returning
➢ Likely not returning
➢ Very unlikely to return
➢ Unsure

Chatbot Implementation Questions

Imagine a college or university that you were considering had a chatbot portal available for students to submit questions and receive immediate responses. Using an institutional portal, you would be able to ask questions to the chatbot, and the artificial intelligence that powers the chatbot would search your account and the university website and reply to you with the correct information, all without human involvement. Responses would be immediate.

An example is below:
39. If you were able to communicate with the Financial Aid Office and Business Services via a chatbot, would you use the system?

➢ Yes
➢ No
➢ Unsure
40. If you would use the system, what are the main reason(s) you would use it? (select all that apply):

- Convenience
- Ability to obtain information immediately
- To avoid being transferred to multiple departments on the phone
- Ability to obtain information outside of normal business hours
- Avoid waiting on hold
- To have the response sent in writing, so I could look at it later
- Other (write-in): ________________________________

41. If you would not use it, why not?

- I have concerns regarding security of personal information
- I don’t like receiving information in this format
- I prefer to talk to someone face-to-face
- I prefer to talk to someone on the phone
- I don’t think a chatbot would provide the information I need
- Other (write-in): ________________________________

42. How effective do you believe a chatbot designed to assist you with financial aid would be?

-Very effective
- Effective
- Neutral
- Slightly ineffective
- Very ineffective
43. How effective do you believe a chatbot designed to assist you with your business services account would be?

- Very effective
- Effective
- Neutral
- Slightly ineffective
- Very ineffective
- Unsure

44. If a chatbot was offered by a college/university, how would that change your perception of the institution?

- My opinion would be much higher
- My opinion would be slightly higher
- There would be no difference in my opinion
- My opinion would be slightly lower
- My opinion would be much lower
- Unsure

45. If USM adopted a chatbot that provided automatic responses to you, would you:

- Be more likely to reenroll
- No difference in likelihood to enroll or not
- Be less likely to enroll
- Unsure
46. If you answered that you would “be more likely to enroll” or “be as likely to enroll,” how would the chatbot make a difference? (Select all that apply)

- I would feel that I could get more accurate information on my account.
- I would not have to wait for a response.
- I would not be transferred to multiple departments to get answers to my questions.
- I prefer not to speak with humans.
- I work/am busy during normal business hours, and a chatbot would be convenient.
- I wouldn’t be embarrassed to ask a chatbot ‘silly’ questions.
- Other: __________________________________________

Please provide any additional comments on the use of chatbots in higher education, including any suggestions for implementations:

________________________________________________________________________
APPENDIX J – Survey Instrument for Enrollment Management Staff

Biographical Questions

Sex (Dropdown menu):

➢ Male
➢ Female
➢ Prefer not to respond

What is your year of birth? (Enter four-digit number)

Please identify your race/ethnicity (Select all that apply).

○ Asian-American
○ Black/African-American
○ Hispanic
○ Native American
○ Pacific Islander
○ White/Caucasian
○ Two or more races
○ Prefer not to respond

Your Experience as a Staff Member The University of Southern Mississippi

1. What department are you currently employed in?

➢ Admissions
➢ Business Services
➢ Financial Aid
➢ New Student and Retention Programs
This research focuses on the experiences of the student populations at The University of Southern Mississippi, specifically pertaining to communication platforms, technology, student finances, and retention. Please consider your experience as a staff member at Southern Miss when answering these questions.

2. What current options do students have to communicate with a member of your office? (Select all that apply):
   - Phone call
   - Email
   - Fax
   - Text message
   - Walk-in office hours
   - Scheduled appointment
   - Other (write in):

3. How would you rate the effectiveness of the phone call communication option your office offers to students?
   - Excellent
   - Good
   - Fair
   - Poor
   - Unsure
   - This is not an option offered by our office.

4. How would you rate the effectiveness of the email communication option your office offers to students?
➢ Excellent
➢ Good
➢ Neutral
➢ Poor
➢ Unsure
➢ This is not an option offered by our office.

5. How would you rate the effectiveness of the fax communication option your office offers to students?
➢ Excellent
➢ Good
➢ Neutral
➢ Poor
➢ Unsure
➢ This is not an option offered by our office.

6. How would you rate the effectiveness of the text message communication option your office offers to students?
➢ Excellent
➢ Good
➢ Fair
➢ Poor
➢ Unsure
➢ This is not an option offered by our office.
7. How would you rate the effectiveness of the **walk-in office hours** communication option your office offers to students?

➢ Excellent
➢ Good
➢ Neutral
➢ Poor
➢ Unsure
➢ This is not an option offered by our office.

8. How would you rate the effectiveness of the **scheduled appointment** communication option your office offers to students?

➢ Excellent
➢ Good
➢ Neutral
➢ Poor
➢ Unsure
➢ This is not an option offered by our office.

9. How would you rate the ease of use for students communicating with your office via **phone call**?

➢ Very easy
➢ Somewhat easy
➢ Neutral
➢ Somewhat difficult
➢ Very difficult
10. How would you rate the ease of use for students communicating with your office via email?

➢ Very easy
➢ Somewhat easy
➢ Neutral
➢ Somewhat difficult
➢ Very difficult
➢ Unsure
➢ This is not an option offered by our office.

11. How would you rate the ease of use for students communicating with your office via fax?

➢ Very easy
➢ Somewhat easy
➢ Neutral
➢ Somewhat difficult
➢ Very difficult
➢ Unsure
➢ This is not an option offered by our office.

12. How would you rate the ease of use for students communicating with your office via text message?

➢ Very easy
➢ Somewhat easy
➢ Neutral
➢ Somewhat difficult
➢ Very difficult
➢ Unsure
➢ This is not an option offered by our office.

13. How would you rate the ease of use for students communicating with your office via walk-in office hours?

➢ Very easy
➢ Somewhat easy
➢ Neutral
➢ Somewhat difficult
➢ Very difficult
➢ Unsure
➢ This is not an option offered by our office.

14. How would you rate the ease of use for students communicating with your office via scheduled appointments?

➢ Very easy
➢ Somewhat easy
➢ Neutral
➢ Somewhat difficult
➢ Very difficult
➢ Unsure
This is not an option offered by our office.

15. What do you perceive are the communication challenges for students specifically pertaining to their financial aid account? (Select all that apply)
   - Delay in response from staff
   - Unclear instructions from staff
   - Inconsistent responses from staff members/departments
   - Transferring of students to another department (Southern Miss Shuffle)
   - Poor staff training
   - Insufficient numbers of staff members to properly respond
   - Poor staff attitudes
   - Lack of student understanding of staff responses
   - Staff turnover
   - Other: 

16. What do you perceive are the communication challenges for students specifically pertaining to their business services account? (Select all that apply)
   - Delay in response from staff
   - Unclear instructions from staff
   - Inconsistent responses from different staff members/departments
   - Transferring of students to another department (Southern Miss Shuffle)
   - Poor staff training
   - Insufficient of staff members to properly respond
   - Poor staff attitudes
   - Lack of student understanding of staff responses
17. The term “Southern Miss Shuffle” is an unofficial phrase used to describe the frequent transferring of students from one department to another. How much of a challenge do you perceive the Southern Miss Shuffle to be? (Choose one)
   - Very challenging
   - Somewhat challenging
   - Neutral
   - Very unchallenging
   - Unsure

18. Please select all applicable reasons why you believe the Southern Miss Shuffle is a problem:
   - Difficulty in finding correct information
   - Constantly changing information
   - Relocation of staff with institutional knowledge
   - Lack of training for staff
   - Lack of cross-training from other departments
   - Desire for staff to remain in their lane/answer questions specifically assigned to their department
   - Other: ____________________________________________________________

*Southern Miss Communication Plan Questions*
19. On an **average day**, how many staff members in your department are answering **phone calls** at any given time? (Please include any graduate assistants or students answering phones)

20. On an **average day**, how many **phone calls** from students/parents does your office receive during normal business hours? (Please estimate if unsure)

21. On an **average day**, how many staff members in your department are answering **individual email inquiries** at any given time? (Please estimate if unsure)

22. On an **average day**, how many **email inquiries** from students/parents does your office receive in a 24-hour period? (Please estimate if unsure)

23. During your **peak times**, how many staff members in your department are answering **phone calls** at any given time? (Please include any graduate assistants or students answering phones)

24. During your **peak times**, how many **phone calls** from students/parents does your office receive during normal business hours? (Please estimate if unsure)

25. During your **peak times**, how many staff members in your department are responding to **individual email inquiries** at any given time? (Please estimate if unsure)
26. During your **peak times**, how many **email inquiries** from students/parents does your office receive in a 24-hour period?

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**Chatbot Implementation Questions**

*Southern Miss students are often first-generation, minority, or students with lower socioeconomic statuses, without access to vital information about financial aid and billing. Chatbot prototypes have been developed at institutions like Georgia State to provide another medium for communication. Using an institutional portal, students would be able to ask questions to the chatbot, and the artificial intelligence that powers the chatbot would search the student’s account and the university website and reply to the student with the correct information, all without human involvement. Responses would be immediate.*

*Only in the event that an answer could not be found would a staff member from that office receive an email prompt to reply to the student. Once the staff member replies, that answer would become part of the chatbot’s knowledge bank.*

*An example is shown below:*
27. Prior to this survey, had you ever heard of a chatbot?

- Yes
- No
- Unsure

28. How effective do you believe a chatbot specifically designed to assist the Southern Miss student population with financial aid would be?
29. Please explain why you selected your previous response:

30. How effective do you believe a chatbot specifically designed to assist the Southern Miss student population with business services’ inquiries would be?

- Very Effective
- Effective
- Neutral
- Slightly Ineffective
- Very Ineffective
- Unsure

31. Please explain why you selected your previous response:

32. If the university chose to implement a chatbot in your department to improve communication with students, how would you react?

- I’d be 100% on board
- It would be something I’d consider
- I’d use it if I was required to
➢ I’d prefer to keep our current communication model
➢ I’d reject it
➢ Unsure

33. Please explain why you selected your previous response:

34. If your office was able to communicate with students via a messaging portal chatbot, do you think the system would benefit the staff?

➢ Yes
➢ No
➢ Unsure

35. If you indicated that the staff would benefit from chatbot implementation, please select the reason(s) why:

   o Decreased time spent on repetitive emails
   o More time to provide in-depth financial counseling
   o Fewer phone calls
   o Less walk-in traffic
   o Other: ____________________________

36. If a chatbot was implemented at Southern Miss, what are the main drawbacks of this process for staff (Select all that apply)?

   o Decreased opportunity to interact with students
   o Financial cost to operate chatbot
   o Potentially incorrect responses
   o Confusing interface for staff
37. If your office was able to communicate with students via a messaging portal chatbot, do you think the system would benefit the students?

➢ Yes
➢ No
➢ Unsure

38. If you believe a chatbot would benefit the students, please select the reason(s) why you believe it would be helpful:

➢ Clearer responses
➢ Less delay from time of inquiry to response
➢ More consistency among responses
➢ Limiting transfer of students to multiple departments
➢ More convenient option with immediate responses
➢ Other: __________________________________________

39. If a chatbot was implemented at Southern Miss, what are the main drawbacks of this process for students (Select all that apply)?

➢ Lack of opportunity to interact with staff
➢ Potentially incorrect responses
➢ Confusing interface for students
➢ Other: __________________________________________

40. If your department chose to implement a chatbot, how effective do you believe the chatbot would be in facilitating communication with students? (Choose one)
➢ Very effective
➢ Effective
➢ Neutral
➢ Slightly Ineffective
➢ Very ineffective
➢ Unsure

41. If USM adopted a chatbot that provided automatic responses to prospective or incoming students, do you think enrollment:
   o Would increase significantly
   o Would increase slightly
   o Would remain the same
   o Would decrease slightly
   o Would decrease significantly
   o Unsure

42. If USM adopted a chatbot that provided automatic responses to current students, do you think retention:
   o Would increase significantly
   o Would increase slightly
   o Would remain the same
   o Would decrease slightly
   o Would decrease significantly
   o Unsure
43. How effective do you believe a chatbot specifically designed to assist students with their financial aid would be?

➢ Very effective
➢ Effective
➢ Neutral
➢ Slightly ineffective
➢ Very ineffective
➢ Unsure

44. How effective do you believe a chatbot specifically designed to assist students with their business services account would be?

➢ Very effective
➢ Effective
➢ Neutral
➢ Slightly ineffective
➢ Very ineffective
➢ Unsure

45. How do you believe Southern Miss students would prefer to receive financial aid information from the university? (Rank in order of most preferred to least preferred)

  o Email
  o Postal mail
  o Chatbot
  o Text message
  o Other (write-in): ___________________________________________
46. How do you believe Southern Miss students would prefer to receive business services information, including bills, from the university? (Rank in order of most preferred to least preferred)

- Email
- Postal mail
- Chatbot
- Text message
- Other (write-in): ________________________________

47. If you believe Southern Miss students would be interested in using a chatbot, why do you believe they would use that platform? (Select all that apply)

- Students believe they could get more accurate information about their account
- Students would not have to wait for a response
- Students would not have to be transferred to multiple departments to get answers to their questions
- Students prefer not to speak with any humans
- Students are busy during normal business hours, and a chatbot would be convenient
- Students wouldn’t feel embarrassed to ask a chatbot ‘silly’ questions
- Other: ________________________________

Please provide any additional comments on the use of chatbots in higher education, including any suggestions for implementations:
APPENDIX K – Information Letter and Informed Consent for Former Students

Dear (First Name of Respondent),

My name is Courtney Robinson and I am a doctoral student at The University of Southern Mississippi. For my capstone project, I am analyzing the perceived viability and functionality of current communication methods in juxtaposition with a possible implementation of an artificial intelligence-based chatbot, specifically focused on the conveyance of student financial information. Therefore, I am conducting a survey of former undergraduate students at The University of Southern Mississippi to ask about the communications they had with the Office of Financial Aid and Business Services, and their perceptions on a chatbot prototype that could automate communications between the university and the students.

You were selected to be part of this project because you attended The University of Southern Mississippi in the 2016-2017 academic year, but did not re-enroll for the 2017-2018 academic year. There is no compensation for responding, however, as a token of my appreciation for your participation in this important study, your name will be entered in a drawing for an Amazon Gift Card. To complete the survey online, please click: https://tinyurl.com/USMstudentsurvey.

There is no risk involved, and your answers will be completely confidential. Moreover, the results of the survey will be reported in a summary format, so no one will be able to associate you with your responses on this survey. If you choose to participate in this project, please answer all questions as honestly as possibly. Text responses will be reported word for word, so please do not include your name or provide any identifying
information in your comments. Participation is strictly voluntary, and you may refuse to participate or discontinue participation at any time.

Completed survey submission will indicate your willingness to participate in this study. Thank you in advance for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding financial aid and billing communication, and the impact of these experiences on student retention at The University of Southern Mississippi. If you have any questions about the administration of this survey, please contact me at Courtney.L.Robinson@usm.edu.

Sincerely,

Courtney Robinson, M.Ed.
Courtney.L.Robinson@usm.edu
Doctoral Candidate
Higher Education Administration
The University of Southern Mississippi
https://tinyurl.com/USMstudentsurvey
APPENDIX L – IRB Approval Letter

NOTICE OF COMMITTEE ACTION

The project has been reviewed by the University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 21, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not less than 10 days following the event. This should be reported to the IRB Office via the "Adverse Event Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 18092601
PROJECT TITLE: An Analysis of Viability and Functionality: How Enrollment Management Personnel and Former Students Perceive the Proposed Implementation of an Artificial Intelligence-Based Chatbot Focused on Student Financial Communication
PROJECT TYPE: New Project
RESEARCHER(S): Courtney Robinson
COLLEGE/DIVISION: College of Education and Human Sciences
SCHOOL: School of Education
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Exempt Review Approval
PERIOD OF APPROVAL: 8/28/2018 to 8/28/2019

Edward L. Goshorn, Ph.D.
Institutional Review Board
APPENDIX M – Information Letter and Informed Consent for Enrollment Management Staff

Dear (First Name of Respondent),

My name is Courtney Robinson and I am a doctoral student at The University of Southern Mississippi. For my capstone project, I am analyzing the perceived viability and functionality of current communication methods in juxtaposition with a possible implementation of an artificial intelligence-based chatbot, specifically focused on the conveyance of student financial information. Therefore, I am conducting a survey of enrollment management personnel at The University of Southern Mississippi to ask about their perceptions of the current communication-based tools as well as a chatbot prototype that could automate communications between the university and the students.

You were selected to be part of this project because you are currently employed in one of the following departments: Office of Undergraduate Admissions, Office of Financial Aid, Business Services, or the New Student and Retention Programs office. There is no compensation for responding, however, as a token of my appreciation for your participation in this important study, your name will be entered in a drawing for a Starbucks Gift Card. To complete the survey online, please click: https://tinyurl.com/enrollmentstaff.

There is no risk involved, and your answers will be completely confidential. Moreover, the results of the survey will be reported in a summary format, so no one will be able to associate you with your responses on this survey. If you choose to participate in this project, please answer all questions as honestly as possibly. Text responses will be reported word for word, so please do not include your name or provide any identifying
information in your comments. Participation is strictly voluntary, and you may refuse to participate or discontinue participation at any time.

Completed survey submission will indicate your willingness to participate in this study. Thank you in advance for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding communication strategies, and the impact of these platforms on student retention at The University of Southern Mississippi. If you have any questions about the administration of this survey, please contact me at Courtney.L.Robinson@usm.edu.

Sincerely,

Courtney Robinson, M.Ed.
Courtney.L.Robinson@usm.edu
Doctoral Candidate
Higher Education Administration
The University of Southern Mississippi
https://tinyurl.com/enrollmentstaff
APPENDIX N – Statistics Coding System

Responses for the following questions were coded and used in the quantitative data computations.

CHATBOTCOMM (former students only): If you were able to communicate with the Financial Aid Office and Business Services via a chatbot, would you use the system?

➢ Yes
➢ No
➢ Unsure

CHATBOTFA (former students and staff): How effective do you believe a chatbot designed to assist students with financial aid would be?

➢ Very effective
➢ Effective
➢ Neutral
➢ Slightly ineffective
➢ Very ineffective
➢ Unsure

CHATBOTBUS (former students and staff): How effective do you believe a chatbot designed to assist students with their business services’ account would be?

➢ Very effective
➢ Effective
➢ Neutral
➢ Slightly ineffective
➢ Very ineffective
CHATBOTINST (former students only): If a chatbot was offered by a college/university, how would that change your perception of the institution?

- My opinion would be much higher
- My opinion would be slightly higher
- There would be no difference in my opinion
- My opinion would be slightly lower
- My opinion would be much lower
- Unsure

STAFFBENEFIT (staff only): If your office was able to communicate with students via a message portal chatbot, do you think the system would benefit the staff?

- Yes
- No
- Unsure
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