Exploring how an interface of connected applications affects the level of practice for congregants in the Christian faith

by

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Abstract

The aim of this project is to advance previous techno-spiritual research by focusing on the effectiveness of connected mobile applications to affect the level of spiritual practice in congregants of the Christian faith. The literature reviewed suggests that spiritual practices such as prayer, scripture reading, and monetary giving can facilitate spiritual experiences. By aggregating the data of the Bible app, the Abide app and the Givelify app that offer avenues to spiritual practice, this project shows the overall level of practice of users during the use and non-use of an interface of connected applications. The Daily Spiritual Experience Survey (DSES) was used to rate the level of spiritual experience of participants while using the Bible app, the Abide app and the Givelify app. The researcher found that there was no evidence that an interface of connected applications had an effect on the level of practice for congregants in the Christian faith. The study found that the dashboard did not have a positive or a negative effect on users DSES survey data over time. This research opens new avenues by which techno-spiritual focused mobile applications can be harnessed to support religious and spiritual practices or experiences.

Dedication

This work is dedicated to my mother and late father whose years of hard work and dedication built a foundation and paved the way for the pursuit of my collegiate educational journey.

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I want to thank my dear wife, brother, family, church, extended family, friends, professors, and colleagues for all of their support, encouragement, patience, affirmation and prayers during my dissertation journey. I have reached this peak in my academic career because of your collective push.

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Chapter 1: Introduction

The purpose of this research project is to explore how an interface of connected applications affects the level of practice for congregants in the Christian faith. It has the potential to show that congregants read scripture, pray and give monetarily more or less based on what they are shown on a visual dashboard. Additionally, the study explores whether a visual dashboard effects the spiritual experience of congregants. This study consist of a month long analysis of two groups of participants from local Christian assemblies of varying age, gender and race. The control group used three different computer/mobile phone apps that focus on scripture reading, prayer and tithing. The experimental group used the same three apps but also had a dashboard that showed quantitative data from each app in a coherent fashion. The visual dashboard is an interface of connected applications that acts as a focused area that displays all of the user's spiritual discipline data aggregated from each respective app. The dashboard showed how many times the individual read scripture, how many times they gave monetarily and how long they prayed using the apps on a daily basis. The dashboard allowed each user to clearly see their data without opening each individual app to access their progress or comprehensive activity. Once each day, during the data collection all participants were prompted by text message to report their app usage and take the Daily Spiritual Experience Scale survey which was used to measure the day-to-day spiritual experience of participants in the study.

When technologies are utilized to support religious and spiritual practices, they have been called techno-spiritual (Bell 2006). According to the research reviewed, technology has repeatedly been leveraged to enable religious and spiritual practices such as prayer applications and online technology that facilitate virtual church (Bell, 2006, p. 146-151). One of the emerging focus areas that have developed is the leveraging of phone affordances for religious and spiritual practice through mobile applications. Researchers have studied ways to classify and categorize spiritual applications in app stores, although it is difficult due to the complexity of religion and spirituality (Campbell et al., 2014). Additionally, as emerging techno-spiritual focus areas continue to develop, the techno-spiritual research field has the potential to affect aspects of contemporary society, the HCI field overall and can be used as a way to communicate cultural and religious identities. (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p.168). Although there is evidence of emerging techno-spiritual research, it is noted that a lag still exist compared to other areas of human-computer interaction research (Buie and Blythe, 2013, p. 2316). This study aims to contribute to the general body of techno-spiritual research by focusing on the effectiveness of connected applications on spiritual practice and spiritual experience.

Chapter 2: Literature Review

The purpose of this research project is to explore how an interface of connected applications affects the level of practice for congregants in the Christian faith. Based on current research that investigates whether techno-spiritual based technology increases spiritual practice, the researcher predicts that an interface of connected applications will increase the level of practice in Christian congregants. Secondly, the researcher predicts that an interface of connected applications will affect the spiritual experiences of congregants of the Christian faith based on current research that states that techno-spiritual based technology can be directly tied to spiritual practices such as prayer, scripture reading and monetary giving to facilitate spiritual experiences. The following literature review outlines research that focuses on techno-spirituality, how barriers have affected the study of techno-spirituality, the Cultural Studies Framework, the Daily Spiritual Experience Scale, the Bible app, the Abide app, the Givelify app and the Future of Techno-Spirituality.

Focus areas of techno-spirituality

In the last few years, new focus areas in techno-spirituality have developed. Furthermore, as the human-computer interaction field continues to expand, advancements have grown at a slow pace. One of the emerging focus areas that have developed is the leveraging of phone affordances for religious and spiritual practice. As an example,

Muslims have used mobile technology to aid prayer and research on technology that facilitates Christian prayer experiences (Ecklund, E. H., Johnson, D. R., Scheitle, C. P., Matthews, K. R., & Lewis, S. W., 2016, p. 1). A research study reviewed and analyzed the content of prayers saved on an online prayer wall called 24-7 Prayer versus requests written on physical prayer cards (Ecklund, E. H., Johnson, D. R., Scheitle, C. P., Matthews, K. R., & Lewis, S. W., 2016, p. 1). Also, in a study that monitors prayer activity, sensors in mobile technology were used to measure proper posture in Muslim users who pray five times a day (Al-Ghannam, R., & Al-Dossari, H., 2016, p. 1). These phones used supervised machine learning algorithms to recognize, detect and correct the stages of prayer whether standing, bowing, prostrating or sitting using a mobile accelerometer sensor (Al-Ghannam, R., & Al-Dossari, H., 2016, p. 1). Other mobile techno-spiritual designs include Find Mecca, which is an application that points Muslims in the correct direction for prayer (Al-Ghannam, R., & Al-Dossari, H., 2016, p. 2). Additionally, Athkar, which is a technology that acts as a reminder for morning and evening religious scripture reading (Al-Ghannam, R., & Al-Dossari, H., 2016, p. 2). Other advancements in mobile technologies include those built to aid Muslims in correctly distinguishing Halal food choices and a proposed “radio frequency identification (RFID) technology that utilized a wireless sensor network to document and invigilate the paths of users during their Hajj journey (Al-Ghannam, R., & Al-Dossari, H., 2016, p. 2).

Researchers have also found ways to classify and sort techno-spiritual mobile applications as the new technology has emerged. H.A. Campbell developed a methodological approach to the categorization of techno-spiritual mobile applications available on the iTunes App Store. Through a review of 451 religious apps, inconsistencies in the iTunes search function and the failure of app designers to tag the apps that they have created with a religious affiliation were noted when relying solely on iTunes categories to identify app functions and purpose (Campbell et al., 2014). Bellar replicated this finding in 2012. There is research that focuses on categorizing religious apps (Campbell et al., 2014), app effect on religious identities (Wagner, 2013), and how app affordances intersect with religious, social and cultural values (Torma & Teusner, 2011).

First, Campbell's approach is very different from Apple's current categorization method and instruction. On Apple's developer website, there is guidance to aid developers in categorizing applications. (Choosing a Category. n.d., para. 1). The site notes that categories enable users uncover new apps to suit their requirements and assist developers with finding the most precise and effectual groupings for the apps that they create (Choosing a Category. n.d., para. 1). Developers can choose one primary and a secondary category for their app. These categories help that app to be more or less discoverable within the App Store during browsing and determine which tabs the app will be placed under (Choosing a Category. n.d., para. 2). The guidance also gives criteria on

how to choose the most appropriate category for apps (Choosing a Category. n.d., para. 3). Apple's specifics to consider for app categorization are the purpose of the app, the logical place the app's' audience would search for it in and it's proximity to comparable applications (Choosing a Category. n.d., para. 3). Furthermore, the website states that if a category is chosen that is not appropriate for the app, the action is against App Store Review Guidelines (Choosing a Category. n.d., para. 4).

In additional research that examined Apple's categorization through a techno-spiritual lens, Bellar focused on three questions to understand the process for using religious applications: What are the factors individual Evangelical Christians consider when choosing a religious iPhone app, what experience do individual Evangelical Christians seek from religious iPhone apps and how do individual Evangelical Christians use religious iPhone apps to navigate their spirituality?

Many religious apps are classified under reference, books, lifestyle, education and other categories in the App Store according to Bellar's analysis of iPhone applications (Bellar, 2012, p. 1). Christian, Jew, Muslim, Hindu, and Buddhist religious applications included content for Christians, Jews, Muslims, Hindus, and Buddhists (Bellar, 2012, p. 1). Currently, there are no specific categories designated as religion or spirituality (App Store. n.d., p. 1). The categories now included in the App Store are: Books, Business, Catalogs, Education, Entertainment, Finance, Food & Drink, Games, Health & Fitness, Lifestyle, Kids, Magazines & Newspapers, Medical, Music, Navigation, News, Photo &

Video, Productivity, Reference, Shopping, Social Networking, Sports, Travel and Utilities (Choosing a Category. n.d., para. 11). Consequently, developers are forced to make choices from a limited list of utilitarian or secular classifications that fail to precisely identify the point or intention of the religious app (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 159). These constraints were also underpinned in the work of Torma and Teusner's (2011) study on the intersection of cultural and social values through the lens of the iPhone and when Bellar (2012) studied how characteristics of apps affected Evangelical Christians usage (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 157).

Since the App Store launched in 2008, millions of apps have been downloaded millions of times (App Store. n.d., para. 1). When users search the App Store's religious apps without a category dedicated to the subject, the vast amounts of search results that aggregated can become overwhelming (Bellar, 2012, p. 25). Researchers have deemed it impossible to determine an exact number of religious or spiritual applications that are available in the App Store because of the limitations of the current search functions available (Buie and Blythe, 2013., pg. 2319). When Bellar conducted a study on how Evangelical Christians use, look for, choose and interact with religious applications to navigate their spirituality, it was observed that users also found the App Store challenging to leverage for research purposes (Bellar, 2012, p. 1). Participants in the study used religious applications for one week and were asked to take notes on their experiences in a

diary (Bellar, 2012, p. 19). Afterward, interviews were conducted for clarity on the notes (Bellar, 2012, p. 19). Participants in the study reported that they were unable to find any religious apps that appealed to them when conducting a limited search (Bellar, 2012, p. 25). These difficulties created unanticipated problems for participants, which overall may hinder research results when the App Store is involved.

Furthermore, Campbell's work to implement a systematic way to categorize religious and spiritual apps encountered similar impediments. (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 157) Campbell noted, "inconsistencies in the iTunes search function or failure of app designers to clearly tag apps with a religious affiliation, made it difficult to determine exactly how many apps dedicated to a given religion are found within the iTunes store, and which religions were most commonly represented" (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 158). For instance, searches for religious apps by the descriptor "Christian" resulted in non-Christian related results (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 158). In Buie's (2013) study, a search for the keyword "spiritual" returned "several apps on spirit levels (a building construction tool) and several on alcoholic beverages" (Buie and Blythe, 2013., pg. 2319).

Additionally, there was also confusion between what may have been identified as religious (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 158). Some religious terms misidentified as cultural/ethnic identity apps because they were not

clearly labeled. (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 158). For instance, some apps identified as Jewish concentrated on Jewish historical or cultural undertakings but did not harness a well-defined correlation to Jewish religious beliefs or rituals (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 157). App store search difficulty could also hinder researchers looking for existing data or information on religious apps. (Buie and Blythe, 2013., pg. 2319). App store information is liable to change rapidly and unpredictably as apps are deleted without visible record (Buie and Blythe, 2013., pg. 2320).

Campbell's work on a classification system to strategically identify types of religious applications and categorize them produced 11 unique groupings (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 168). The 11 categories included Prayer, Focus/Meditation, Ritual, Sacred Textual Engagement, Devotional Worship, Religious Utilities, Religious Social Media, Religious Games, Religious Wisdom and Leaders, Religious Media Outlets, and Religious Apps for Kids (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 163). Apps that appropriately fit in these focus areas are the Hebrew Calendar Converter, which is a tool that acts as a reminder for important religious observances and Hope for Today, which is a digital magazine that may be difficult to find in the current categories. As these focus areas grow, the techno-spiritual research field has the potential to affect aspects of contemporary society and the HCI field overall (Campbell, H. A., Altenhofen, B., Bellar,

W., & Cho, K. J., 2014, p. 168). These groupings were arranged in two main parent classifications: apps oriented around religious or spiritual practice and apps embedded with religious or spiritual content. (Campbell, H. A., Altenhofen, B., Bellar, W., & Cho, K. J., 2014, p. 163) Campbell's work, if more widely tested, could prove to be a more useful method of categorizing religious and spiritual apps. This work takes a closer look at the specific functions of religious and spiritual apps and categorizes them accordingly.

Researchers have found that technology has been leveraged to enable religious and spiritual practices. The Muslim faith requires prayer as a daily religious practice at least five times a day in a specific direction towards Mecca (Bell, 2006, p. 146). As a technological solution to these religious requirements, an app was created and released in Malaysia. The application directs users in the appropriate direction toward Mecca, synchronizes prayer times and enables a download of the Koran, the faith's holy book (Bell, 2006, p. 149). Additionally, Ilkone Mobile Telecommunications produced a mobile handset equipped for the needs of phone users who are of the Muslim faith (Bell, 2006, p. 149). This device also has location enabling to direct users toward Mecca, has a dual-language Koran, prayer time notifications, Ramadan fasting reminders, the ability to join live prayer calls and mute functions to avoid notifications during prayer (Bell, 2006, p. 149). The affordances of the Malaysian app and the Ilkone handset are examples that highlight the importance of meditation, prayer, or quiet time in the Muslim faith and other religious systems' sacred spaces (Bell, 2006, p. 150). These technological

affordances help to enable spiritual experiences and may affect the quantity and frequency of spiritual practice of religion.

In like manner, the Catholic Church of England has established an online parish to facilitate church attendance virtually (Bell, 2006, p. 151). People who are unable to attend church in person can attend online, increasing the quantity and frequency of their spiritual practice in a way not possible without technological assistance (Bell, 2006, p. 151). There are also various online memorial halls in China that have been created for the spiritual practice of ancestral worship (Bell, 2006, p. 151). The Chinese government has advocated for them as an alternative to expensive funerals and other rituals (Bell, 2006, p. 151). With the savings created from online memorial walls, the frequency and quantity of the spiritual practices could increase.

In conclusion, these practices and ones like it highlight the fact that religious practices over time have migrated to online resources, applications, software and other technologies (Bell, 2006, p. 151). For instance, an app has been developed that enables worshippers at Aylsham Parish Church to rate hymns, make hymn selections for services, share prayer focuses and offer feedback on sermons ("Church asks worshippers to use smartphone app to rate hymns and share prayers." n.d., para. 3). Worshippers vote and the results are shown on a screen in the room ("Church asks worshippers to use smartphone app to rate hymns and share prayers." n.d., para. 2). During sermons, attendees can share the content of their prayers using technology ("Church asks

worshippers to use smartphone app to rate hymns and share prayers." n.d., para. 3). The church's goal for using the app is to make its services more interactive experiences ("Church asks worshippers to use smartphone app to rate hymns and share prayers." n.d., para. 6). Other churches have also contacted Aylsham Parish Church to see how they can adopt the technology ("Church asks worshippers to use smartphone app to rate hymns and share prayers." n.d., para. 13). The church reports that although the app has not increased attendance, it has encouraged active engagement from participants in their services ("Church asks worshippers to use smartphone app to rate hymns and share prayers." n.d., para. 10). Technological spaces are being utilized to create new ways for spiritual and religious user experiences (Bell, 2006, p. 151).

It is also evident that religious individuals and communities have particular and deliberate belief systems, habits, and rituals, which inform the distinct ways new media technologies are used or created (Bellar, 2012., p. 16). The central religious or spiritual principles of individuals can determine whether a faith community will adopt a technology or spurn it (Bellar, 2012, p. 16).

Acts such as prayer, scripture reading and monetary giving directly affect spiritual experiences. In fact, research in internet habits, corporate marketing strategies, and new product developments show that there is an emergence of users leveraging technology to support religious practices (Bell, pg. 142, 2006). The critical role technology plays in the link between deity and humanity can be referenced in early Western societies

(Blondheim, 2016, pg. 4). “Fire and cloud, words and texts, electronic and digital media (the printing press) that were understood to be shared with God assumed magical and divine qualities” (Blondheim, 2016, pg. 4). The Bible, or written “Word of God,” as known to Christian believers is seen as a bearer of God’s presence (Blondheim, 2016, pg. 5). Therefore, it is a reasonable proposition that a Christian believes that God could be revealed by invoking holy text, uttering it, transcribing it, or studying it (Blondheim, 2016, pg. 4). Furthermore, when a person who identifies as a Christian and believes in the faith groups teachings, reads the written “Word of God,” it is possible that they may identify that they feel God’s actual presence in the that moment(Underwood, 2011, p. 32). It then can be said that spiritual practices potentially can lead to spiritual experiences. If this is correct, spiritual practices such as prayer, scripture reading, and monetary giving could connect to spiritual experiences.

Spiritual experiences are considered essential for particular religious traditions or practices (Underwood, 2011, p. 31). In a study, researchers found that Through Confession: A Roman Catholic App was used as a tool for Catholics to prepare for the Sacrament of Confession (Teusner and Torma, 2011, pg. 150). The app provides three primary services: self-examination, a guide through the Rite of Confession and a list of prayers from which users can select and read, including versions of the Act Contrition (Teusner and Torma, 2011, pg. 151). With a personalized examination of conscience for each user, password-protected profiles, and a step-by-step guide to the sacrament, this

app invites Catholics to prayerfully prepare for and participate in confession by the Rite of Penance. (Teusner and Torma, 2011, pg. 151). Users report that confession is more comfortable when they use the app (Teusner and Torma, 2011, pg. 151). This media bridges self-examination, a religious practice, to confession, a religious experience.

In summary, one of the emerging techno-spiritual focus areas that have developed is the leveraging of phone affordances to support religious and spiritual practice. Additionally, many phone affordances are leveraged through techno-spiritual applications. Researchers have found ways to categorize these applications in standardized ways. It has also been found that these spiritual practices are considered essential for particular religious traditions potentially can lead to spiritual experiences.

How barriers have affected the study of techno-spirituality

Elizabeth Buie argued that the evidence-based understanding of techno-spirituality (information and communication technology that aids human spirituality) lags behind the closely related areas of aesthetics, emotion, affect, and other components of subjective user experience (Buie and Blythe, 2013, p. 2316). Buie identified three main themes of techno-spiritual internet connected technology in the field of human-computer interaction and categorized them as institutional, experiential and practical (Buie and Blythe, 2013., pg. 2317). She noted that techno-spiritual internet-connected technology research "focused on how religious groups adopted and adapted new technologies," and

that religious groups often use internet-connected technology as a means to communicate messages and grow members spiritually (Buie and Blythe, 2013., p. 2317). The experiential category includes techno-spiritual internet-connected technology that facilitates an instant spiritual experience (Buie and Blythe, 2013, p. 2318). Lastly, the practical category includes techno-spiritual internet-connected technology that allows users "to carry out their spiritual practices but involve no direct participation in the experiences" (Buie and Blythe, 2013, p. 2317). Although Buie distinguished these three themes, she also noted that the "institutional, practical, and experiential roles are not mutually exclusive: some spiritually oriented ICTs exhibit aspects of more than one" theme (Buie and Blythe, 2013, p. 2318). Additionally, Buie noted that the human-computer information research lacked content that focused on spiritual "education (especially of children), prayer exchanges, trivia quizzes, stories, comparisons of different faiths, guidance for daily living, teachings and sermons from specific leaders," although technology in these areas exist (Buie and Blythe, 2013, p. 2320).

Over the last 20 years, human-computer interaction research papers directly focused on techno-spirituality have increased in the Association for Computing Machinery and other societies (Buie and Blythe, p. 2317, 2013). However, although the HCI community is focusing on user-centric design, designing and testing technology for a religious purpose is scarce in the research literature. (Al-Ghannam, R., & Al-Dossari, H., 2016, p. 5). Furthermore, Elizabeth Buie conducted a literature review that found

information and communication technology that aids human spirituality, or techno-spirituality, has not kept pace with other fields that have similar aspects (Buie and Blythe, p. 2316, 2013). The noted conclusions of the study were that research has been produced by a small group of people and notes some reasons why this is the case.

Buie noted in her research that techno-spirituality might be irrelevant to the HCI community, that studying subjective experience is challenging and spiritual or religious experiences are regarded as personal for people to articulate or share with a researcher (Buie and Blythe, p. 2316, 2013). Additionally, the study inferred that researchers might fear being shunned for bringing a religious agenda to their work. Despite these hindrances, the article surmounts that a topic can be studied from scientific perspective exclusive of any position being inferred regarding its substance, and any focus area that consist of technology that is used as a part of so many individuals existences, is a fundamental topic for HCI research (Buie and Blythe, p. 2321, 2013).

Another reason why a lag exists in the study of techno-spirituality is that barriers exist in the academic study of the area. Bell (as cited in Buie, 2014) has urged the human-computer interaction (HCI) research community to devote more research to the use of technology in spirituality and religion to help researchers understand how technology can contribute to spiritual experiences (Buie and Blythe, 2013., pg. 2320). A diverse set of researchers throughout the academic community have echoed this sentiment, including those interested in Islamic techno-spirituality due to almost 1.2 billion Muslims'

worldwide. Furthermore, Islamic religion is considered the fastest growing religion in the world. This is leading scholars to urge emphasis on the design and usability of techno-spiritual applications in areas populated by Islamic people (Ahmad, N. A., Hanis, F., & Razak, A., 2013., p. 6). However, despite urging over time, academia has largely avoided the challenge of studying techno-spirituality (Buie and Blythe, 2013., pg. 2322).

Buie and Blythe noted that based on their experience and conversations with other researchers interested in this field, the lack of research in the academic study might be due to barriers that exist. The first barrier that is raised is that HCI is perceived to be irrelevant to the academic community (Buie and Blythe, 2013., pg. 2320). Additionally, members of the academic community may believe that the study of HCI should avoid religion and spirituality because it is not scientific (Buie and Blythe, 2013., pg. 2321). Typically, objective scientific investigation has not usually been associated with studying subjective experience or accepting the validity of the observation of the user's personal, spiritual or religious experiences (Buie and Blythe, 2013., pg. 2321). Furthermore, considerably intimate spiritual or religious experiences may be too deeply personal for participants in studies to effectively communicate to researchers (Buie and Blythe, 2013., pg. 2321). Religion and spirituality are deeply personal subjects and along with politics and sex are somewhat rarely found in HCI-related conversations (Buie and Blythe, 2013., pg. 2321). It is suspected that researchers believe studying techno-spirituality is

professionally precarious and are reluctant to research the area due to the aforementioned reasons (Buie and Blythe, 2013., pg. 2321).

Barriers in the academic study of techno-spirituality have also influenced the study of the use of technology in spiritual or religious practices and experiences. First, barriers in the academic study of techno-spirituality have affected hiring. In a field study of the job application process conducted with almost 10,000 résumés of fabricated job applicants, researchers sought if there was evidence of religious discrimination. (Wright, Bradley R.E., 2014, p. 58) In the study, the fabricated applicants posed as both men and women. The names of the job applicants had no ethnic or religious connection, similar work experience and each were involved in extracurricular activities during college with the addition of a student religious group. The student religious groups that were listed included existing religions such as Catholic, Evangelical Christian, Jewish, Muslim and Pagan. There was also an Atheist title used and a false religion as a control group without any religious affiliation. The field study determined that the addition of a reference to a type of religion could reduce employer callbacks by almost 40 percent. (Wright, Bradley R.E., 2014, p. 58)

Secondly, barriers in the academic study of techno-spirituality have affected the freedom to express interest in techno-spiritual research. Researchers that conducted the study confirmed American normality that “religious expression should be compartmentalized and private, something kept at home or brought out only in specific,

limited circumstances" (Wright, Bradley R.E., 2014, p. 59). Such data could reinforce the fear of publicly identifying oneself with a particular belief system due to perceived results can be consequential. (Wright, Bradley R.E., 2014, p. 59). These findings suggest that an applicant with religious research interest may face discrimination or that if hired, that applicant may feel pressure to keep one's religious interest or affiliation hidden.

Additionally, the Equal Employment Opportunity Commission (EEOC) reported that there were 3,721 religious discrimination complaints in 2013 (Wright, Bradley R.E., 2014, p. 56). Four in ten of the complaints were dropped primarily due to a lack of the ability to prove the said discrimination (Wright, Bradley R.E., 2014, p. 56). These reports suggest that even if one presents a case of religious discrimination, there is the likelihood that the case will not be winnable.

Thirdly, barriers in the academic study of techno-spirituality have affected religious diversity in academia. "The academic community tends to be less religious than other segments of the population according to a recent survey of academics that found that 52% reported no religious affiliation, as compared with 14% of the general population" (Buie and Blythe, 2013., pg. 2320). It is possible, due to this omission that a newcomer or potential employee may not feel that they have like-minded people who would back them if their faith was displayed or they wanted to express religious research interest. Opposition or the lack of support could be some of the root causes that

consequently result in some researchers losing interest and moving on to other subject matter (Buie and Blythe, 2013., pg. 2320).

Conversely, there is a cluster of researchers at Texas A&M University that have led in the publication of techno-spirituality research. Heidi Campbell, Wendi Bellar, and others attend and work at the university and have produced a significant amount of the research available on techno-spirituality. Texas A&M University is an example of one of the places where academics with a techno-spiritual interest or research focus area may be able to thrive. In 2013, Buie's research on techno-spirituality found that at the time, eight out of 19 scholarly articles on techno-spirituality was the work of one person and her collaborators (Buie and Blythe, 2013., pg. 2320). Buie's research highlights some of the disparities in techno-spirituality research and how these barriers affected the study of the use of technology in spiritual and religious practice or experiences. This project aims to contribute new knowledge in the techno-spiritual research area that focuses on the engagement of users spiritual practice and spiritual experience within a technological framework. Future research in this area can continue to build and fill the gap that is well documented.

In conclusion, it has been noted in previous research that there are various barriers that have affected the study of techno-spirituality through hiring, religious expression and religious diversity in academia.

The Future of techno-spirituality

Although a lag still exist in the techno-spiritual research focus area, an emergence has occurred in the creation and use of techno-spiritual applications (Buie, 2014). As a result, there are over 6,000 techno-spiritual applications that are available in app stores (Campbell et al., 2014). Furthermore, the amount of people practicing Islam has grown above 1.2 billion Muslims' worldwide and the faith is considered to be one of the fastest growing religions (Ahmad, N. A., Hanis, F., & Razak, A., 2013., p. 6). This is leading scholars to urge emphasis on the design and usability of techno-spiritual applications in areas populated by Islamic people (Ahmad, N. A., Hanis, F., & Razak, A., 2013., p. 6).

Islamic applications focus on affordances that directly link to its religious practices. For instance, smartphone sensor technology has created new pathways for data mining applications that have the ability to detect movement (Al-Ghannam, 2016, pg. 1) The technology was used to accurately recognize bio-physiological reactions during prayer activity and the duration of each stage of prayer (Al-Ghannam, 2016, pg. 1). The study also showed that the correctness of individual and congregational prayer was identified with a 90% accuracy rate (Al-Ghannam, 2016, pg. 11). As more research has shown that technology can be the conduit to support Islamic religious and spiritual experiences and technological advancement of technology persist, the affordances for techno-spiritual devices will directly align with the new developments that enable experiential and practical uses.

Bell (as cited in Buie, 2014) has urged the human-computer interaction (HCI) research community to devote more research to the use of technology in spirituality and religion to help researchers understand how technology can contribute to spiritual experiences (Buie and Blythe, 2013., pg. 2320). Despite urging over time, academia has largely avoided the challenge of studying techno-spirituality (Buie and Blythe, 2013., pg. 2322). As use cases arise in Islamic techno-spiritual instances they have the potential to also be utilized in Christian applications of new knowledge tied to research.

Additionally, within the emergence of use cases for technology for spiritual and religious purposes, there is a focus on its effect on the lives of older adults and the disabled. In a study of older adults, it was found that participants use internet technology and devices for at least 15 unique religious or spiritual purposes (Kang, 2019, pg. 19). One of the participants expressed that they found it easier to pray and read the Bible using the Bible App on their smartphone or tablet. Others reported that using technology in their daily lives for religious and spiritual purposes helped to mitigate their perceived age-related disparities, to engage in spiritual growth opportunities and to facilitate spiritual experiences.

The results also represent how a way of life can be formed and defined through the use of technology for religious and spiritual purposes. Participants with disabilities or who were sick, shut-in and unable physically to freely engage in spiritual activities outside of the home were able to utilize technology to communicate and engage in

spiritual experiences through the use of technology (Kang, 2019, pg. 21). As the older adults progressed to the later stages of life, they used technology in ways that were new to them and unknown before these types of technologies became a necessity (Kang, 2019, pg. 21). Technology was reported to make spiritual engagement easy to access through various techno-spiritual focused applications and other secular apps used for religious or spiritual purposes such as Pandora music or other music streaming services (Kang, 2019, pg. 21). One participant specifically listened to meditative music while others played Bible trivia apps, streamed sermons, participated in online religious classes and other use cases. (Kang, 2019, pg. 20). Also, there is an expansive scope of areas in currently available literature that focus on producing technology that is used to effect humans in a positive manner, especially those centered on religious or spiritual experience (Buie, 2019, pg. 1).

Schussler proposes that as technological developments continue at a rapid pace, transhumanism will take shape as the future characterization of this century's digital age (Schussler, 2019, pg. 1). In this context, Schussler suggests that technology takes the place of previous Judeo-Christian mechanisms for transcendence and becomes a facilitator for human's spiritual experiences and dually improve the state of human existence on Earth (Schussler, 2019, pg. 1). For instance, Gabriele Trovato, who is a roboticist designed, a device called SanTO that is used to recite scripture (Robitzski, 2019). The robot provides companionship for older adults in senior living facilities

(Robitzski, 2019). The robot stands at about two feet and primarily uses artificial intelligence (Robitzski, 2019). It is designed with facial recognition to detect emotion and then reads scripture related to the emotion it registers from the persons expression (Robitzski, 2019). Robitzski also cites a rise in the production of new products at the forefront of a convergence of technology and religion due to improvements in artificial intelligence (Robitzski, 2019). Robotic technology is being used to communicate sermons, religious leadership are endorsing the use of apps, and robot figurines are used to pray to Buddhist divinities (Robitzski, 2019).

Techno-spiritual applications are an integral part of a new wave of technologies that facilitate transcendence. The Bible app, Abide app and SanTO and other tools represent technologies that have the potential to reduce cognitive load for users. The Abide app has selections of preloaded topic-based meditations that reduce the requirements for user input and play successively. The Bible app has a simplified interface for scripture reading that reduces distractions on the screen so that the users attention is not diverted. Reduced distraction facilitates information processing and cognitive load. As a result, a user's working memory is not overburdened beyond their processing capacity. These cognitive artifacts reduce the amount of mental resources users may need to complete their desired task.

Campbell explores techno-spirituality within science fiction films involving artificial intelligence. Through her analysis she suggest that the films are "underwritten"

by techno-spiritual myths which examine tense misconceptions about divine transcendence, which is the relationship between humans and technology that gives humans godlike qualities (Campbell, 2016, pg. 2). Secondly, she notes the perspective that using technology is a type of religion or a form of spirituality called technological mysticism (Campbell, 2016, pg. 2). Lastly, she highlights the view that technology is God in and of itself which is called technosis (Campbell, 2016, pg. 2). Campbell argues that popular film narratives about humans future are influenced by elements of spirituality (Campbell, 2016, pg. 3). As humans continue to embrace technology, these themes point to the possibility of a post-humanity in which humans evolve based on advancements in technology (Campbell, 2016, pg. 26).

The idea that technology is seen as a gateway to the divine is increasingly found in recent research related to techno-spirituality (Campbell, 2016, pg. 27). However, in order for these occurrences to be discovered by researchers, one must search varied terms. Buie substantiated the claim that there are increases in the variance of terms used in relation to techno-spirituality and closely related fields (Buie, 2019, pg. 2). Buie notes this shift in the context and terminology and uses transcendent experience (TX) as a overarching general term for spiritual experience but suggest that the community of researchers in the field endeavor to formalize operational definitions (Buie, 2019, pg. 2). Transcendent experience broadly encompasses occurrences of linking with something

superior to oneself including terms like techno-spirituality, self- transcendence and spiritual experience (Buie, 2019, pg. 2).

Another closely related term that researchers have coined is transformative experience, which are instances that can temporarily or permanently change perspectives, values and the knowledge-bases of humans (Kitson et al., 2019, pg. 1) They are abrupt, significant phenomenological alterations of one's cognitive existence that can increase knowledge and self-perception (Gaggioli, 2019, pg.98)

Transformative experience design is a growing human-computer interaction focus area that researchers have increasingly developed interest in (Kitson et al., 2019, pg. 1). Transformative experience design focuses on the process by which technology can be used to facilitate these occurrences, investigate their impact and convert that result into insights for further discovery (Kitson et al., 2019, pg. 2). Due to the wide array of disciplines with interest in the aspects of transformative experience design, there is overlap in lexicon, frameworks and academic lenses to approach the topic (Kitson et al., 2019, pg. 2). As a result, more conversations and publication of research must continue amongst the academic communities with vested interest in the topic. Various research groups have directed their attention to identifying transformative affordances and although challenging, creating design recommendations that foster transformative experience by utilizing interactive technology (Kitson et al., 2019, pg. 3). Gaggioli suggests his model that focuses on content, form, medium and purpose which is called

Transformative Experience Design (TED) (Kitson et al., 2019, pg. 3). Gaggioli aimed to design a set of guidelines for the future creation of technology that supported transformation (Gaggioli, 2019, pg.117). However, defining and creating design frameworks for transformative experiences is difficult due to the inability to articulate a particular outcome even as researchers attempt to focus on singular types of transformative experiences at one time (Kitson et al., 2019, pg. 3). Therefore more research is required to continue to explore transformative experience and closely related areas (Kitson et al., 2019, pg. 3).

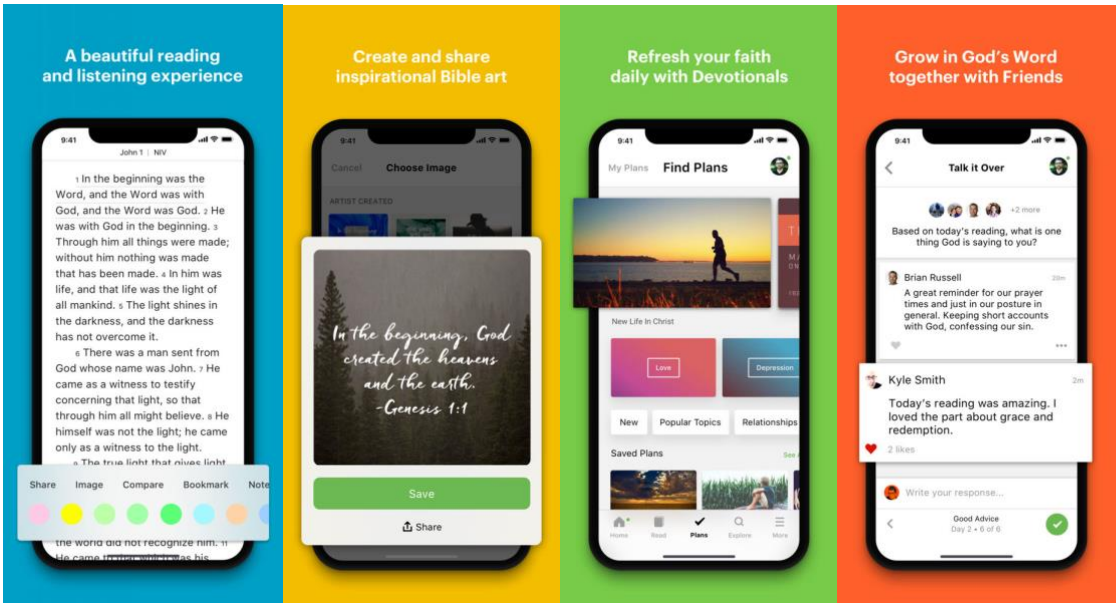
The future of techno-spirituality includes the expansive use of artificial intelligence and other emergent technologies for human support and advancement. According to Buie's research, there are few papers within human-computer interaction studies that are based on the examination and observation of techno-spirituality that give specific definitions to clarify the spiritual practices or experiences that they are created to facilitate (Buie 2018, p. 42). Additionally, Buie found that there were very few instances that works were cited on spiritual experiences within techno-spiritual research (Buie 2018, p. 33). In conclusion, as technology that is produced for religious or spiritual purposes and the greater good of humanity materialize, it will require more dialogue and the clarification of terminology that relates to techno-spirituality.

The Bible App

The participants in this study utilized three apps, the Youversion Bible App, the Abide App, and the Givelify App. This study also uses the Daily Spiritual Experience Scale to measure the effects of the study's dashboard on participants.

The Youversion Bible App is a popular scripture reading app that can be downloaded from the mobile operating systems application stores (Torma, R., & Teusner, 2011, p. 145). It includes devotionals, Bible in audio, reading plans and social aspects. When users opt to create an account on Youversion.com, their user data synchronizes browsers across devices. (Torma, R., & Teusner, 2011, p. 145). For instance, when a user bookmarks a passage of scripture, it will be saved so that they are able to pick up where they left off in the passage at a later time (Torma, R., & Teusner, 2011, p. 145). Additionally, users can follow the app activity of other users on the app.

Figure 1.



(screenshots from Apple iOS App Store)

The Youversion developers continue to update the app with new feature benefits for users such as the Year In Review and Snapshot. At the end of the year Youversion sends a review to its users who sign up to their email list called a Snapshot ("Snapshot," n.d., para. 11). The message in the email format outlines Bible app engagement across the app user base. In the message it shares data on the most read verse of scripture, most read Bible plan, the most shared images through the app, how many total verses were shared for the year, total Bible chapters read, international app engagement and chapters listened

to in the app. The year in review communicates data about how the Bible app has been used by all users worldwide ("Snapshot," n.d., para. 11).

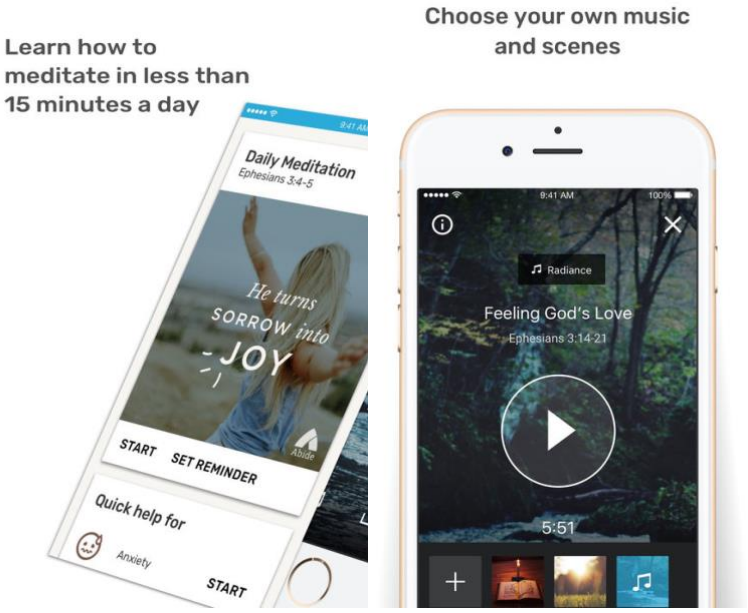
Figure 2.

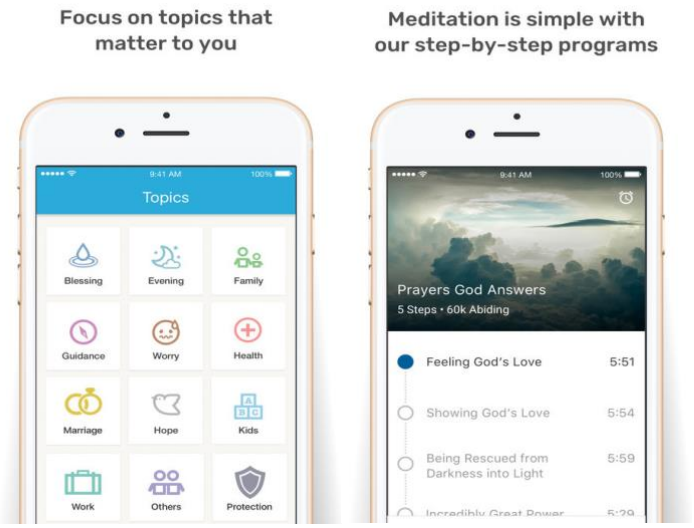
Image of snapshot year in review data ("Snapshot," n.d.)

The Abide App

Abide is a Christian meditation app and the "leading digital platform for Christian meditation hosting 4 million users in 210 countries" ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 5). It was created by a group of former Google, Tesla and other firms employees with the mission to help the world to "experience the peace of Christ through Biblical meditation" by creating an app that would "help bring people closer to God ("About us" n.d., para. 1-2)." The mobile app is the world's most popular Christian meditation app, and has guided "hundreds of thousands of people around the world in Biblical truth and personal reflection" ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 1). The Abide app offers many categories of guides on Biblical text ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 5). The meditations available on the Abide app vary from 2 to 15 minutes of audio ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 2). Abide conducted a study surveying 216 people who practiced guided Christian meditation ("Christian Meditation Linked to Lower Stress, Insomnia, and Depression." n.d., para. 2). Their findings suggested that Christian meditation has helped with stress, depression, and insomnia ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 2).

Figure 3.





(screenshots from Apple iOS App Store outlining Abide App features)

The key findings found that 91% of participants with mild to chronic depression reported that Christian meditation helped to ease their symptoms of depression. Additionally, 80% of the participants in the study reported that their mild to chronic insomnia or sleep issues subsided and that the guided Christian meditation on the Abide app helped them sleep better ("Christian Meditation Linked to Lower Stress, Insomnia, and Depression." n.d., para. 2). In this study, it was noted that the "health benefits of Eastern meditation have been heavily researched leading to health and educational organizations to promote these practices" ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 3). However, it was also noted in the full findings that similar research had not

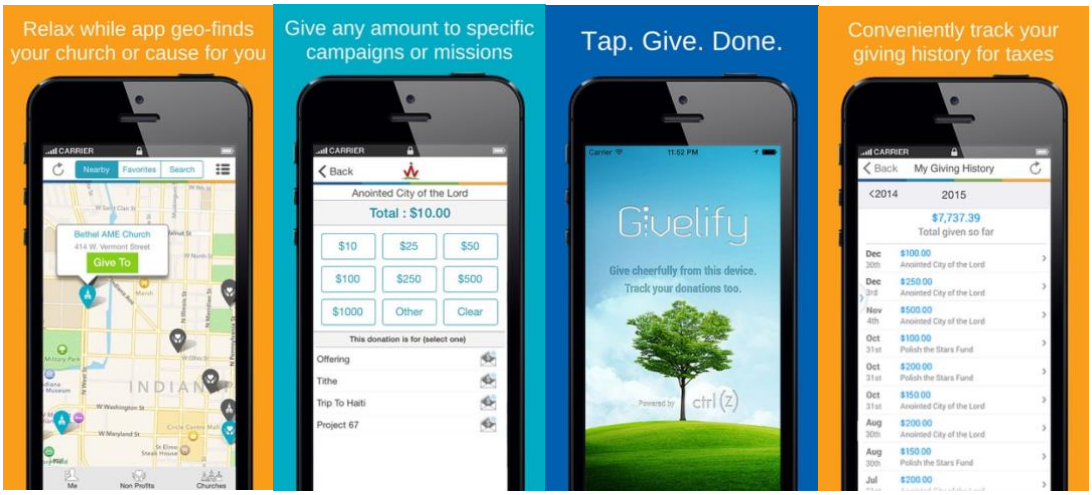
been conducted concerning Western religious meditation ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para. 3). One of the goals of this study is to add to this body of research by exploring how Western religious users respond to techno-spiritual applications.

The Givelify App

Givelify is a free, secure donation app in which users can choose a donation amount, a fundraising entity and give monetarily ("Givers." n.d., para. 1, 11). There are over 330,000 churches and 1.9 million nonprofits available on the app to make donations to ("Givers." n.d., para. 1). Users can give to non-profit organizations and pay church tithes, offerings or donations through the app ("Givers." n.d., para. 12). There is no limitation to the amount or frequency of giving ("Givers."n.d., para. 14). The Givelify app is free to use and download for givers but cost for organizations to be a part of ("Pricing." n.d., para. 1). Donations are available in the organizations linked bank account on the next business day. Givelify also offers a free web-based donation management software that tracks donations according to donor or fundraising campaign with visual analytics, financial management software integration, custom branding, custom fundraising campaign management, and administration account setup. ("Nonprofits."n.d., para. 1-15).

Other affordances of the app include automatic donation receipts, annual donation reports, the ability to set favorites and donation tracking ("Givers." n.d., para. 7-11). It is available on iOS, Android and the web ("Givers."n.d., para. 1).

Figure 4.



(screenshots from Apple iOS App Store)

The DSES

This study used the Daily Spiritual Experience Scale (DSES) which is a 16-item self-report survey that is used to evaluate personal encounters and their relation to the spiritual in day-to-day experiences (Underwood, 2011, p. 29). It measures awe, gratitude,

mercy, sense of connection with the transcendent and compassionate love. It also includes measures of awareness of discernment/inspiration and a sense of deep inner peace (Underwood, 2011, p. 29). Although the scale contains portions that are religious, the scale can be administered to participants who are not religious. It gauges facets of private existence that include the transcendent, heavenly or supernatural, beyond what we can be seen or felt or heard (Underwood, 2011, p. 29). The DSES has been widely used in published articles (Underwood, 2011, p. 29) and translations of the scale have been made in Chinese, Spanish, French, Brazilian Portuguese and German (Underwood, 2011, p. 33). Initially developed for use in health studies, it has been frequently used in the social sciences, for program assessment, and for investigating changes in spiritual experiences over time. Also, the DSES has been used in counseling, addiction treatment settings, religious organizations, health studies and has been applied in over 70 published research studies.

The DSES self-report measure asks participants to answer questions based on their personal spiritual experiences. It consists of checkboxes for statements such as I feel God's presence, I feel deep inner peace or harmony, I feel thankful for my blessings, I feel a selfless caring for others, and I desire to be closer to God or in union with the divine (Underwood, 2011, p. 32). The DSES was designed to have deep congruity for those comfortable with the spiritual language and those who are not (Underwood, 2011, p. 30). The word 'spirituality' in the framework of this scale denotes aspects of personal

life that include the transcendent, divine or holy, “more than” what we can see or touch or hear (Underwood, 2011, p. 30).

However, Underwood cautions that although the DSES “can at times provide a useful proxy for spirituality, and operationalize one major aspect of spirituality, it does not capture the construct fully” (Underwood, 2011, p. 31). Furthermore, Underwood cautions that the DSES “does not meet all needs, and other scales should be used to address other needs” (Underwood, 2011, p. 35). The DSES was ultimately created “to have deep relevance for those comfortable with the theistic religious language, but also to provide opportunities to respond for those who are not comfortable with a theistic view” (Underwood, 2011, p. 35).

Furthermore, a paper titled "States of Spiritual Awareness by Time, Activity, and Social Interaction," that was presented at the 110th Annual Meeting of the American Sociological Association (ASA) found that users self-reported that they had elevated degrees of spiritual awareness in the morning and while engaged in activities such as praying, worship, and meditation (“Social Sciences,” n.d., para. 2). Spiritual awareness also was self-reported to be elevated while people listened to music, read, or exercised. It was low while people were doing work-related activities or playing video games (“Social Sciences,” n.d., para. 2). The study’s results originated from a wider study around a technology called SoulPulse, a web-based app to track the level of spiritual awareness in participants during regular daily activities (“Social Sciences,” n.d., para. 3). A diverse set

of participants were sent by email or text message, 15 to 25 randomly selected questions from a larger pool of 120 daily questions, twice a day in the SoulPulse study ("Social Sciences," n.d., para. 7). Some of these questions were also extracted directly from the DSES and the creator of the survey, Lynn Underwood is also a member of the SoulPulse academic research team ("The SoulPulse Team," n.d., para 2).

Results from the SoulPulse study show that techno-spirituality may affect the quantity and frequency of spiritual practice as assessed by the DSES. SoulPulse participants reported that after making observations about the personal survey results that were sent to them from SoulPulse, they changed their behavior accordingly to increase their spiritual practices (Grossman, 2014). For instance, one participant said, "I also realized, as an introvert, I am more aware of God if I have a bigger chunk of quiet time (Grossman, 2014). Another participant stated, "I started scheduling more time to be alone with God, so when I am with people, I can really be with them" (Grossman, 2014). With relevant information DSES participants can use unique and personal information to decide whether they would like to make a behavior change that will alter the quantity and frequency of spiritual practice. The questions on the DSES self-report measure are stated in a way that may allow participants to connect to different aspects of their spiritual practice. For instance, when a participant engages in monetary giving to a missions group, it may be directly connected to the DSES survey question, "I feel a selfless caring for others." When a participant answers the DSES survey question, "During worship, or

at other times when connecting with God, I feel joy which lifts me out of my daily concerns," they may be engaged in scripture reading or other spiritual practices. Additionally, when a DSES participant answers the question, "I ask for God's help in the midst of daily activities," they could connect to their personal prayer times.

The Cultural Studies Framework

According to the Cultural Studies framework, the connection between religion and media circulates and corresponds with the actions of one another (Bellar, 2012., p. 16). Within the Cultural Studies lens human experience is examined where media and religion intermingle in the context of daily life (Hoover, 2006, pg. 17). It views media through the lens of how it amalgamates within peoples lives. (Hoover, 2006, pg. 17). The Cultural Studies framework assumes two main themes. First, at the nexus of media and religion, a way of life can be formed and defined (Kellner, 1995; Hoover, 2006b; Campbell, 2010, Bellar, 2012). Secondly, the Cultural Studies framework assumes that at the intersection of media and religion, a reflection of the two subject areas can be formed. (Bellar, 2012., p. 14).

The Cultural Studies framework is used in this study to determine how the belief and value system of congregants of the Christian faith can affect their use of techno-spiritual applications. Additionally, culture dictates the use and creation of media and technology. As a result, culture can dictate the creation of techno-spiritual applications,

how they are used, their frequency of use and the affordances they provide. For instance, the belief and value system of Life.Church affects the creation of the YouVersion Bible App. Life.Church's religious values intersect with its cultural values. Life.Church is a member of the Evangelical Covenant Church (ECC). The ECC's website states that the group of churches "strongly affirms the clear teaching" of the Bible (Our Beliefs. n.d., para. 12). Evangelical Christians believe that the Word of God, the Bible, is free of error and complete (Bellar, 2012., p. 4).

Furthermore, Evangelical Christians believe that sharing the account of the life of Jesus Christ, or evangelism is a vital part of deliverance from sin and its consequences (Bellar, 2012., p. 16). Within this belief system is a firm and strict commitment to personal evangelism (Bellar, 2012., p. 16). It is also important to note that Life.Church is also committed to building a community with a focus on every aspect of the family through small groups ("Who We Are," n.d., para. 12). Within the cultural studies framework, the belief and value system of the creators of the Bible App immensely affects the technology that the group has created.

The core evangelical beliefs of Life.Church may give the capacity to gain an accurate comprehension of the basis of the Bible App and its affordances. Research has shown that Evangelical Christians may be attracted to religious applications with affordances that enable the ability to study Holy scripture with ease or have convenient information gathering functions that promote getting closer to and knowing God (Bellar,

2012., p. 10). The study uses the Bible App to provide participants with the ability to participate in topic-based reading plans, create notes on passages, search, tag and bookmark text when they create an account (Torma, R., & Teusner, 2011, p. 145).

Based on the Christian belief system, it is important that the Holy text remain accurate and authentic and some users may have a preference for a particular version of the Bible to be sure of it (Torma, R., & Teusner, 2011, p. 145). Through the Bible App's affordances, users have access to several translations and languages of the Bible (Torma, R., & Teusner, 2011, p. 145). The creators of the Bible App also want the Bible to be available to all people at any time, so translations can be downloaded and accessed offline (Torma, R., & Teusner, 2011, p. 145). The translation of the Bible currently in use is prominently displayed near the top of the Bible app screen when viewing text and users can quickly toggle the translation with a touch of the finger (Torma, R., & Teusner, 2011, p. 145).

Additionally, the makers of the Bible App intend for the Bible to be shared. Life.Church believes in "the ability to share, contribute, create, broadcast and communicate" who they are and what they believe with the rest of the world (About YouVersion. n.d. para. 3). Therefore affordances of the Bible App allow for sharing. In the Bible Apps Notes section when users create an account they can write text notes and connect their personal notes to specific Bible verses (Torma, R., & Teusner, 2011, p. 147). These notes can be made private or can be shared publicly with other Bible App

users, emailed, or shared on social media platforms like Twitter and Facebook one verse at a time (Torma, R., & Teusner, 2011, p. 147). When users create an account they are able to find other users and their content. There is also the ability to gain badges for completing plans which together with other Bible App affordances, can create healthy competition or sharing within a community (Torma, R., & Teusner, 2011, p. 145). This social aspect of the Bible app is also in line with research about Evangelicals and media. This research shows that sharing is a universal theme for Evangelical Christians and that the group tends to choose applications that are developed with conversational abilities, especially those that may lead to specific conversations about faith (Bellar, 2012., p. 17).

While there is some commonality between religious traditions in the way that affordances are reflected in techno-spiritual applications, there is no specific universality. Religiousness/spirituality is a multidimensional construct (Underwood, 2011, p. 31). Therefore, it is complicated. Each religion and the affordances its techno-spiritual devices project are diverse. Other religious traditions alter the affordances according to their religious, social and cultural values and needs as seen with the emergence of new technologies around the world. For example, in a study of Orthodox Jewish families' use of home automation in their Sabbath practices a technology was built that controls lights and appliances according to a schedule that a user sets, allowing families to effortlessly practice Sabbath reflection (Buie and Blythe, 2013., p. 2318). This available affordance is distinctly different from the commonly available smart home device built for common

appliance control (Buie and Blythe, 2013., p. 2318). There are various other examples that include AltarNation, which is an "interactive environment that uses telepresence to help physically isolated people meditate with others online" and Sonic Cradle exists to "foster a meditative experience by facilitating users' sense of immersion while following a specific attentional pattern characteristic of mindfulness" (Buie and Blythe, 2013., p. 2319).

Sun Dial, a smartphone app for Muslims uses Islamic images to designate the daily prayer times that point users in the appropriate direction of Mecca (Buie and Blythe, 2013., p. 2319). The Prayer Companion was designed to give a community of cloistered nuns information on specific subjects to focus on during their prayer times (Buie and Blythe, 2013., p. 2319). In Japan, an interactive technology called ThanatoFenestra is being used to pray for the deceased (Ahmad, N. A., Hanis, F., & Razak, A., 2013., p. 1). The Chinese government is also encouraging the creation of online memorial halls to assist the practice of their ancestor worship. These individual religious communities all have a specific technology with affordances that are based on its traditions, practices and customs that are important to their faith groups.

The Cultural Studies framework examines the flow at the intersection of media and religion and determines that out of the intersection of media and religion, culture can be formed, defined and yield results or outcomes (Bellar, 2012., p. 14). The interconnected relationship between religion and media within the Cultural Studies

framework can be multifaceted and involve several distinct dimensions or aspects (Bellar, 2012., p. 14). For instance, research has shown that older adults develop new ways of living their lives based around new technology that has become an integral part of their daily routines (Kang, 2019, pg. 21). Techno-spiritual applications and other tools have replaced the archaic means by which they read scripture and other forms of spiritual practice (Kang, 2019, pg. 21).

In this research study also utilized components of the religious-social shaping of technology (RSST) theory as a framework for this study. The RSST proposes four connecting factors in determining how communities are introduced to and respond to new media technologies: history and traditions, core beliefs and patterns, community negotiation, and community framing and discourse (Campbell, 2010, p. 60). It was adapted by Heidi Campbell from the social shaping of technology theory (Campbell, 2010, p. 60).

RSST uses context of history and culture as a basis to analyze the process by which users negotiate with new media that they encounter (Bellar, 2019, pg. 8). This exploration determines whether users will or will not utilize the media available to them (Bellar, 2019, pg. 8). This research study does not solely focus on users negotiation process with media, but if and how the media effects users spiritual practice and spiritual experience when utilized. However, it is important to note that participants in this study use this specific technology based on their Evangelic Christian beliefs and values and any

negotiation with the media is viewed through that specific belief system. This study's research questions are investigated through a cultural studies and RSST lens because they are specifically focused on: a) how users practice based on their religious culture and b) how that impacts their spiritual experience with the use of the apps and dashboard. Additionally, the dashboard was created with the history, traditions, core beliefs and patterns of the Evangelical Christian faith which values scripture reading, prayer and monetary giving. The specific affordances of the applications that the dashboard integrates promote each of these practices and encourages the acceptance and appropriation of the new technology (Campbell, 2010, pg. 114). This study is also concerned with whether the dashboard will promote a new way of life that religion will be practiced by participants, which is also outlined in the communal framing in discourse aspect of the RSST. Therefore this study is viewed through the culmination of Cultural Studies framework and the Religion Social Shaping Technology lens.

In this research study, the focus is at the intersection of three tenets of the Christian faith culture, scripture, prayer, and monetary giving. The study explores how these three tenets intersect with technology to form a new product, which is a dashboard of connected spiritually focused mobile applications. The main focus of this study is to determine the effect that the dashboard product has on the people using it. It explores the experience of the use of the dashboard as a means to also determine whether a way of life

is formed and defined by daily use of a dashboard of connected techno-spiritual applications.

In this study the Culture Studies framework lens is used to inform how the belief and value system of congregants of the Christian faith can affect their use of techno-spiritual applications such as The Bible App, Abide App and Givelify App.

Justification for this study

Based on the current research, multiple technologies have been built for techno-spiritual purposes, yet there is a lag in the research of techno-spirituality. Additionally, there are no current studies that leverage existing techno-spiritual applications and explore their collective effect on users. This study seeks to fill the apparent gap that exists in the techno-spiritual research area.

Previous general mobile app studies focus on app content and design only (Bellar, 2016). Furthermore, mobile app audiences use religious mobile apps and engagement through these apps to inform their religious identities (Bellar, 2016). Additional research has found that through the use of technology, one can evaluate the effectiveness of how a group of students use social networking technology to establish and develop the daily practice of spiritual discipline (St. John, 2014). This study aims to advance previous research by focusing on the effectiveness of connected techno-spiritual applications to effect spiritual discipline and daily spiritual experience. By aggregating the data of various apps, this project will show the overall level of practice of users and compare it to

their previous state. In conclusion, this project aims to contribute new knowledge in the techno-spiritual research area that focuses on the engagement of users spiritual practice and spiritual experience within a technological framework.

Chapter 3: Methodology

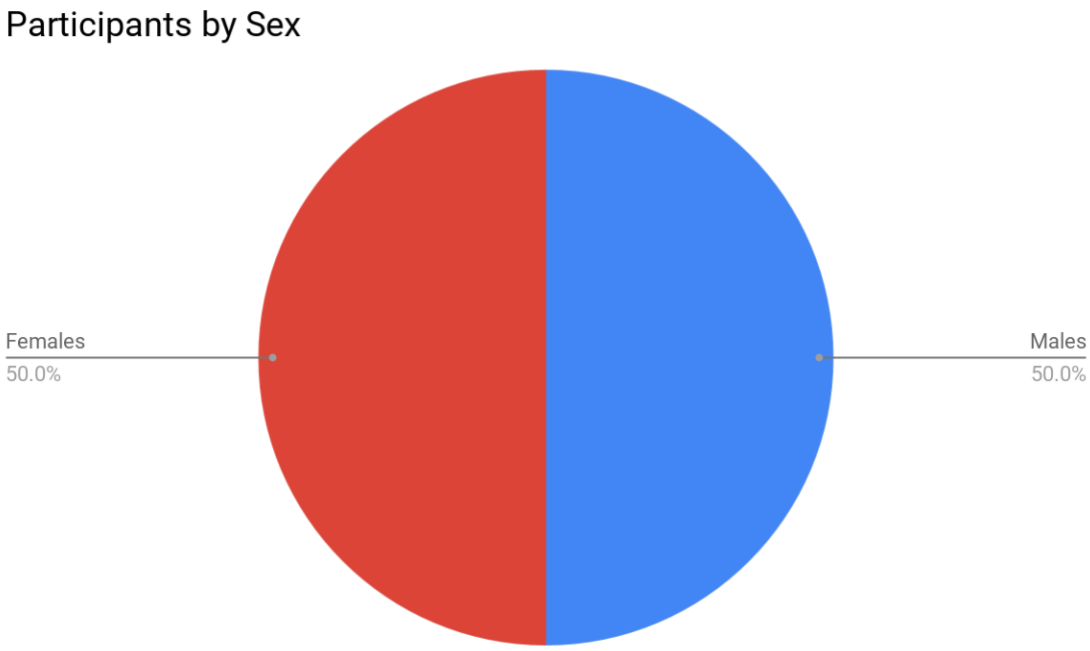
Participants

This study consisted of a month-long analysis containing two groups of volunteers. The participants in this study were from mainstream, non-denominational, evangelical Christian assemblies of varying ages, gender and race. The researcher inquired with various church leadership who reached out to their congregants who were willing to volunteer and participate. It was required that they were proficient with at least one or more of the techno-spiritual applications involved in the study.

- Participant 1, a 31-year-old married man who attends a church in Silver Spring, Maryland and uses Android devices.
- Participant 2, a 34-year-old married woman who attends a church in Towson, Maryland and uses Apple devices.
- Participant 3, a 61-year-old married man who attends a church in Owings Mills, Maryland and uses Android devices.
- Participant 4, a 60-year-old married woman who attends a church in Towson, Maryland and uses Android devices.
- Participant 5, a 31-year-old married man who attends a church in Silver Spring, Maryland and uses Android devices.

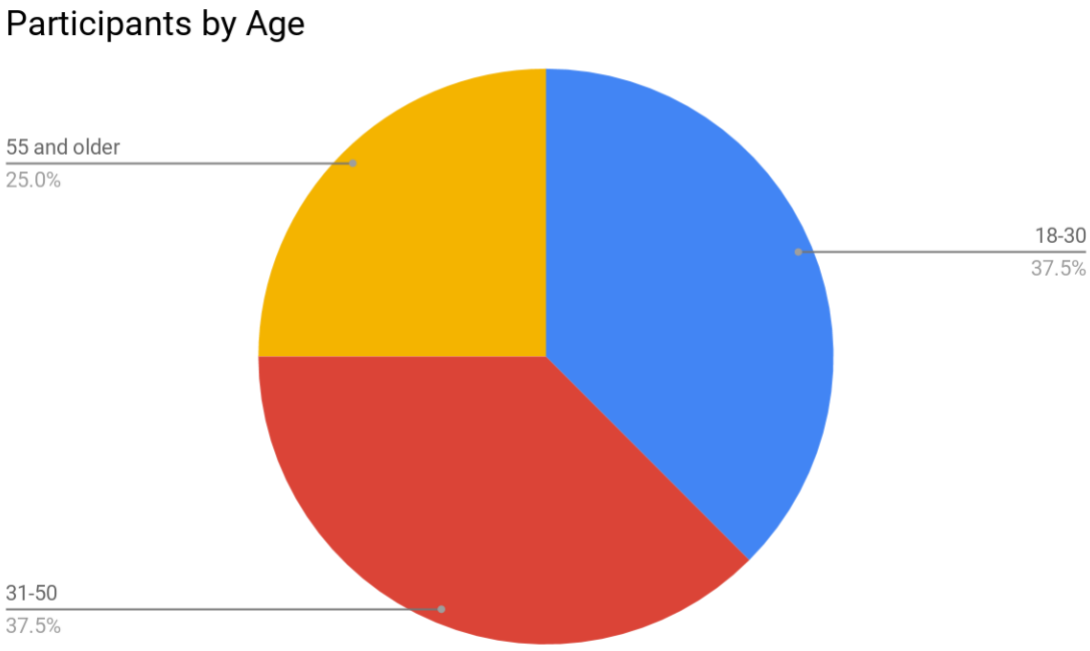
- Participant 6, a 27-year-old man who attends a church in Philadelphia, Pennsylvania and uses Apple devices.
- Participant 7, a 26-year-old woman who attends a church in Philadelphia, Pennsylvania and uses Apple devices.
- Participant 8, a 31-year-old married woman who attends a church in Silver Spring, Maryland and uses Android devices.

Figure 5.



(There were four male and four female participants)

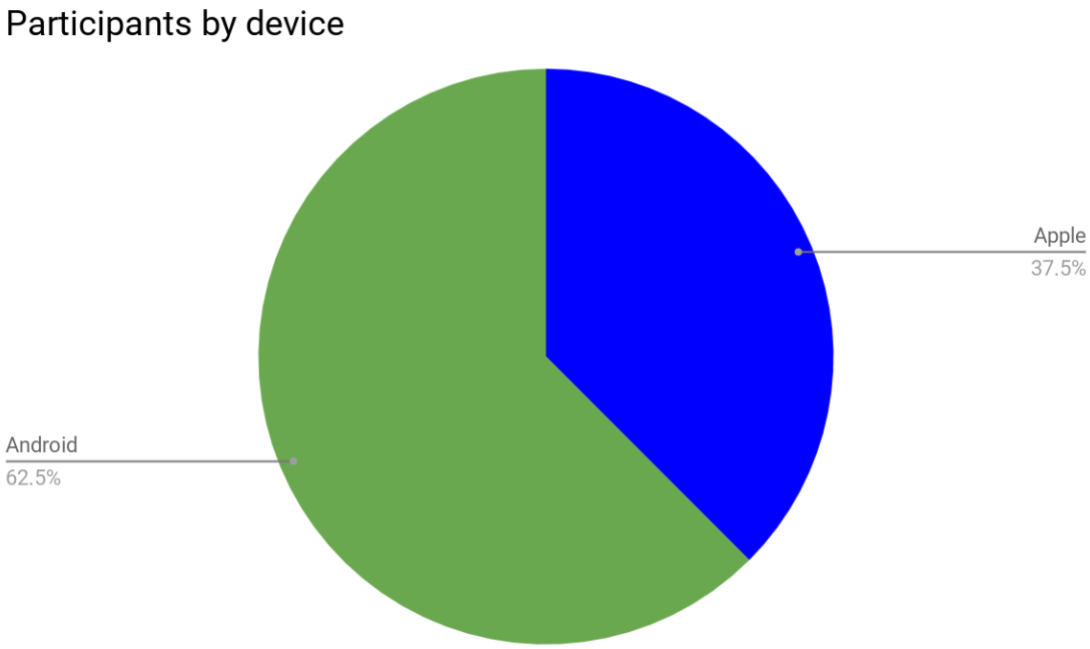
Figure 6.



(The adults that participated in this study were randomly assigned to groups and from different local Christian assemblies ranging in age from 26-61.)

All participants were African American. All participants were volunteers and were not compensated for their participation. Participants self-reported that they use mobile apps regularly on a daily basis. All reported interest in using mobile or web applications, had email access, and/or the ability to receive text messages.

Figure 7.



(More participants used Android devices than Apple devices.)

The participants attended four different mainstream evangelical churches that do not affiliate with a particular denomination. Each of the churches classify themselves as Christian. Two participants attend a church in Owings Mills, Maryland, three attend church in Silver Spring, Maryland, two attend church in Philadelphia, Pennsylvania and one attends church in Towson, Maryland.

Materials

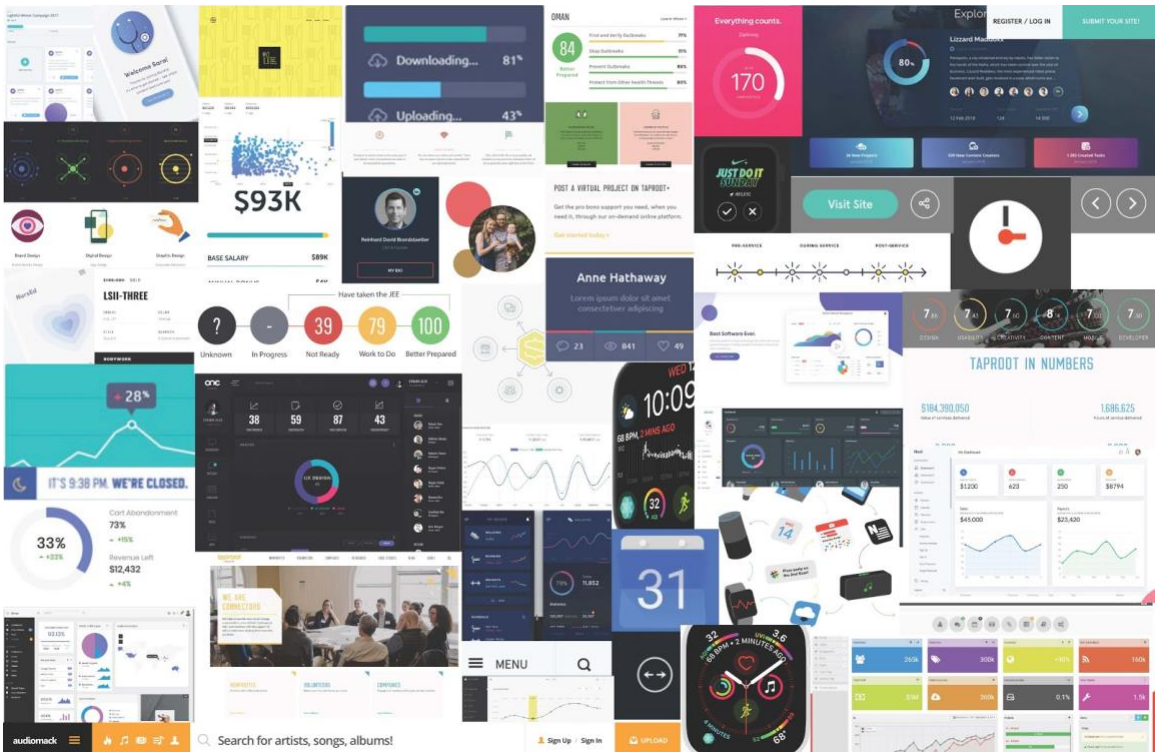
The participants in this study used three different computer/mobile phone apps that focused on scripture reading, prayer and tithing: The YouVersion Bible app, the Abide prayer app and the Givelify app. The YouVersion Bible app is a scripture reading app. The Bible can be read in the app through text on screen or listened to through audio (Torma, R., & Teusner, 2011, p. 145). Users can also access in-app devotionals, bookmark their place in scripture passages and connect with other users through the app if they sign up for an account at youversion.com (Torma, R., & Teusner, 2011, p. 145). Givelify is a digital giving tool that gives congregants the ability to send money that they would like to donate to a church or non-profit organization ("Givers."n.d. para. 1). Lastly, the Abide app is a Christian meditation app that allows congregants to pray along with music and guidance on topics from the Bible ("Christian Meditation Linked to Lower Stress, Insomnia and Depression." n.d., para 1-2).

The experimental group used the three apps with a dashboard that shows quantitative data from each app in a coherent fashion. The visual dashboard acts as a focus area that aggregates all of the user's spiritual discipline data from each respective app. This dashboard allows each user to clearly see their data without opening the individual apps to access their progress or comprehensive activity. For example, the

dashboard shows how many times the individual read scripture, how many times they gave monetarily and how long they prayed using the apps on a daily basis.

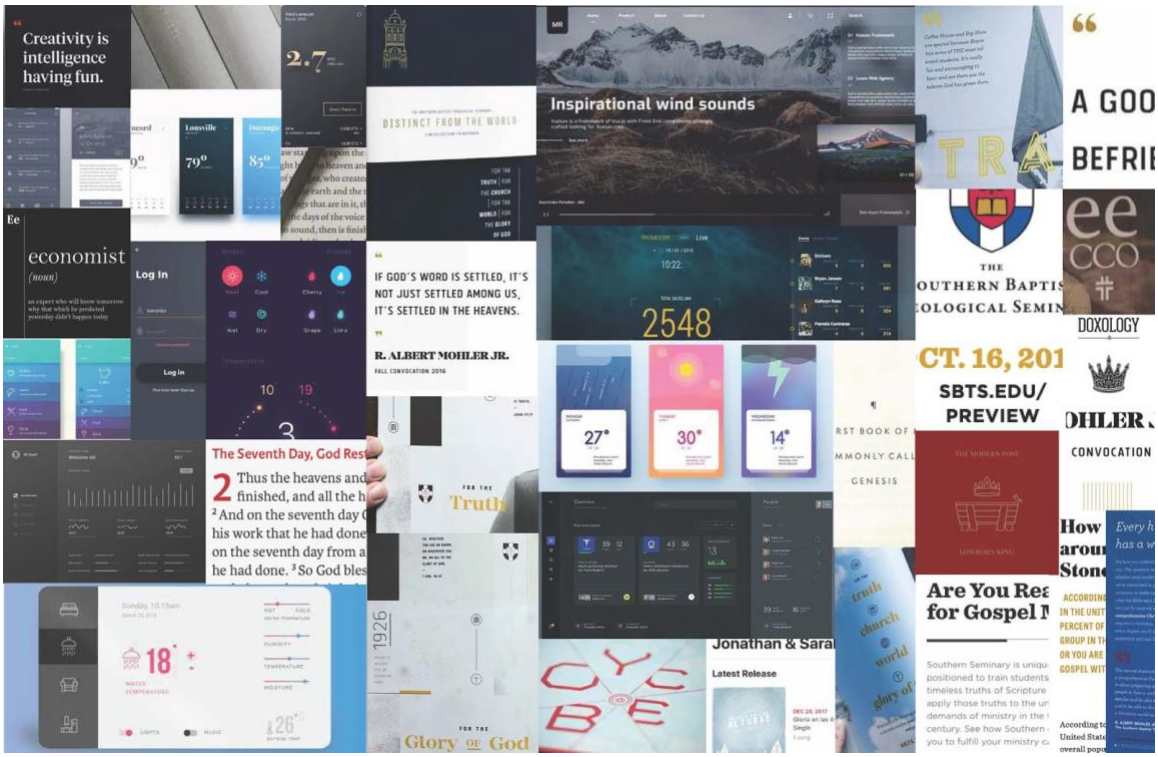
The dashboard used in this study was built through an iterative process. First, visual research was conducted on the internet to collect images of design that fit the dashboard visual theme. A collage of the images was constructed to help influence the design direction of the dashboard. This “moodboard” included similar dashboards, elements, images and color swatches collected through research to form one cohesive visual theme to approach the prototype design.

Figure 8.



(first collection of visual research to support techno-spiritual design direction)

Figure 9.

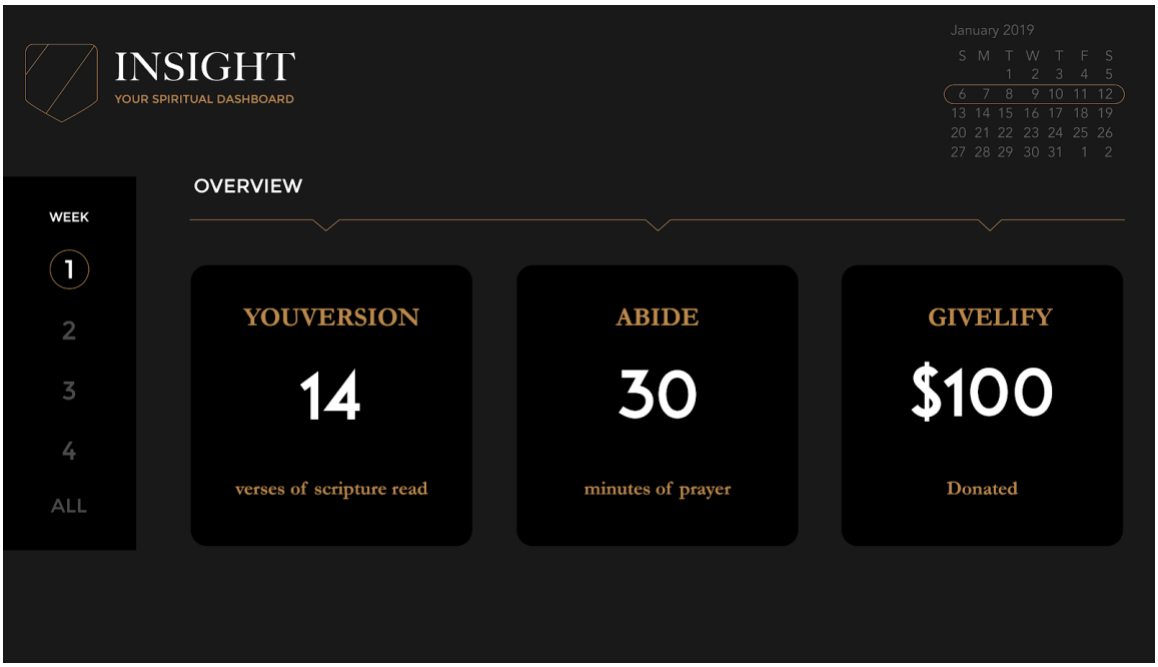


(collection of visual research to support techno-spiritual design direction)

The final moodboard design direction represented visual research from the researchers exploration of elements that support a modern, biblical aesthetic. This consist of darker colors and serif text which is found in printed Bibles, line, shape, type, glyphs with metallic gold, burgundy, red, gray, black and white color palettes.

A strengths, weaknesses, opportunities and threats (SWOT) chart was built to access the intrinsic and extrinsic factors that could influence the project's desired design outcome. Next, wireframes which act as visual schematics of the dashboard were created to guide the design. The visual elements of the dashboard were sketched to ideate the resulting final design used in the study.

Figure 10.



(final dashboard delivered to participants)

The final dashboard displays verses read by the user on the Bible App, minutes prayed using the Abide prayer app and dollars donated using the Givelify app. The dashboard provides a quick glance view of the users data in the main section located in the middle of the screen. A calendar is located in the right hand corner of the screen. When the user clicks on the date, the corresponding week is highlighted and the screen changes to the designated weeks data. In the left hand column of the screen, Week 1 through Week 4 are displayed vertically. When the user clicks on one of the weeks, the corresponding weeks data appears.

The DSES survey was transferred to a Google Form, which is one of Google's in browser applications that enables users to create custom surveys. Lastly, the dashboard was delivered to users as an interactive prototype designed in Adobe Illustrator, a vector design program. Once the design was completed, Adobe Acrobat Pro, a portable document format (PDF) file creation tool was used to build interactivity.

Methods

During this research study the control group used the YouVersion Bible app, the Abide prayer app and the Givelify app. The researcher obtained informed consent from each participant prior to the start of data collection. The data for this study was collected, stored securely and anonymously. The experimental group used the three apps on an

daily basis along with the dashboard that shows how many verses of scripture were read, how many minutes the Abide app was used and how many dollars were given using Givelify. Each experimental group participant was sent an interactive prototype that displayed the data from the three apps updated with their reported information. Once each evening, all participants were prompted by a text message reminder to take the Daily Spiritual Experience Scale (DSES) survey which was used to measure the day-to-day spiritual experience of the participant. Each day the survey participants also reported app activity specifically answering how many scripture memory verses they read, how many minutes they prayed and how many times they gave monetarily. The survey results from each participant was transferred to a Microsoft Excel spreadsheet for data analysis. The Mann-Whitney U test was selected because it met four primary assumptions.

The assumptions were as follows:

1. The dependent variable must be measured ordinally (Mann-Whitney U Test using SPSS Statistics, n.d. Para. 4).
2. The independent variable must contain two or more categorical groups
3. The groups in the study must have no relationship.
4. The variables in the study must not be normally distributed and take the same shape.

The first assumption required that the dependent variable be measured ordinally (Mann-Whitney U Test using SPSS Statistics, n.d. Para. 4). This study's dependent variables

were measured on a Likert scale that was ranked from 1 to 6 which met this assumption. Assumption 2 requires that the independent variable contain two or more categorical groups. The two groups that met this assumption were a group that tested without a dashboard and another one that did not. Assumption 3 requires that the groups in the study must have no relationship. This assumption was met because each group contained different participants and no one participant was in both independent groups. Assumption 4 was not met fully. It states that the two variables are not normally distributed. The variables in this study did not take the same shape therefore means were compared to test for statistical differences.

Chapter 4: Results

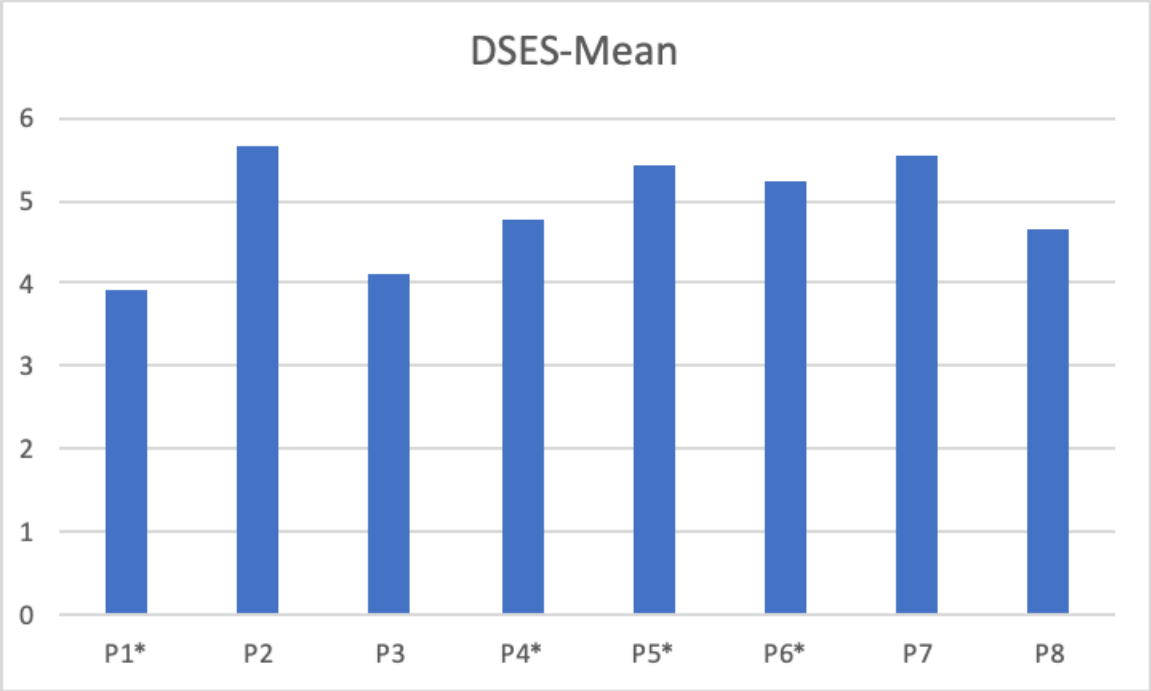
The results of this study explore whether a dashboard of connected applications effects the spiritual practice and spiritual experience of participants. The Mann-Whitney test was used to determine the statistical significance of the results. $P<0.01$ instead of $p<0.05$ was chosen as a benchmark to determine if there was statistical significance to avoid the likelihood that a false positive was returned in results. The mean of the DSES scores for each participant was used to compare mean ranks to interpret the data.

Nonparametric methods were used in this study to compare the statistical differences between the independent variable, a dashboard and dependent variables. Ordinal data was derived from the Daily Spiritual Experience Scale and the data from three techno-spiritual applications.

Table. 1- Operational Definitions

Variables	Operational Definitions
Scripture	The number of Bible verses read using the Bible app
Prayer	The number of minutes participants listened to the Abide app
Giving	The dollar amount that participants gave monetarily using the Givelify app
Dashboard	The console used in this study that displays verses read, minutes prayed and dollars donated for each participant

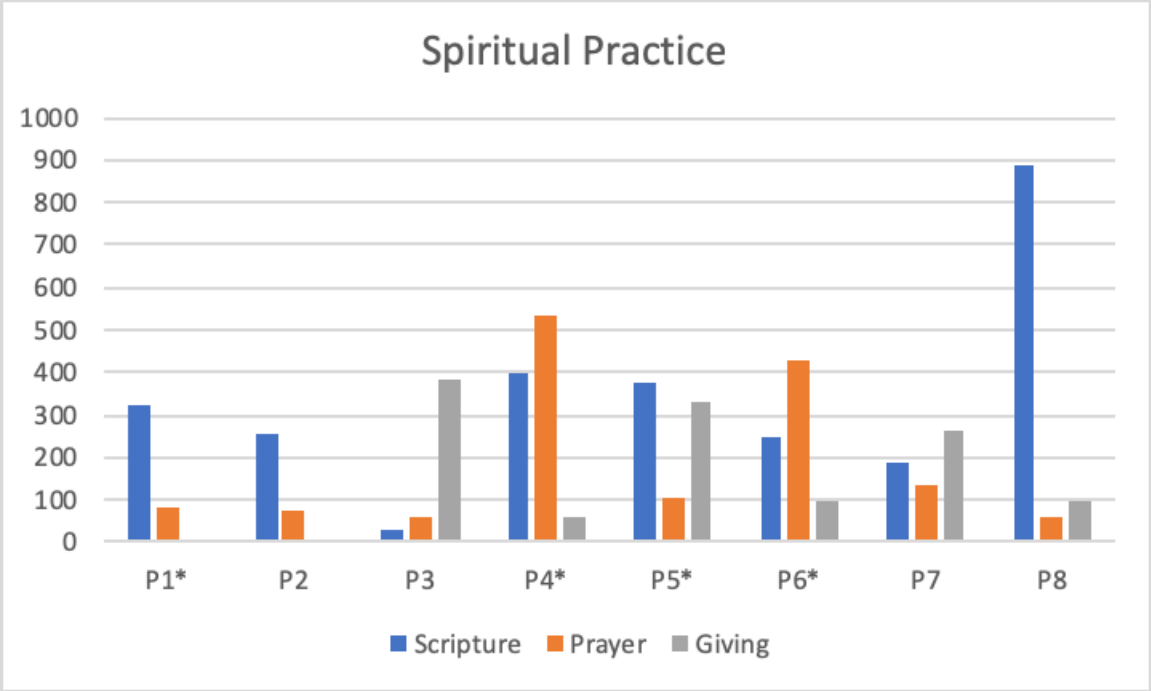
Figure 11.



(DSES mean data for each non-dashboard and dashboard [*] participant)

Participant 2, a none-dashboard user surveyed a higher mean of scores on the DSES survey. Participant 1, a dashboard user scored lowest on the DSES survey. The highest DSES total mean between groups was 5.27 by the group that used the dashboard. The mean for the group that did not use the dashboard was 4.98. The DSES mean for the dashboard group was higher and showed that participants self-reported higher sums.

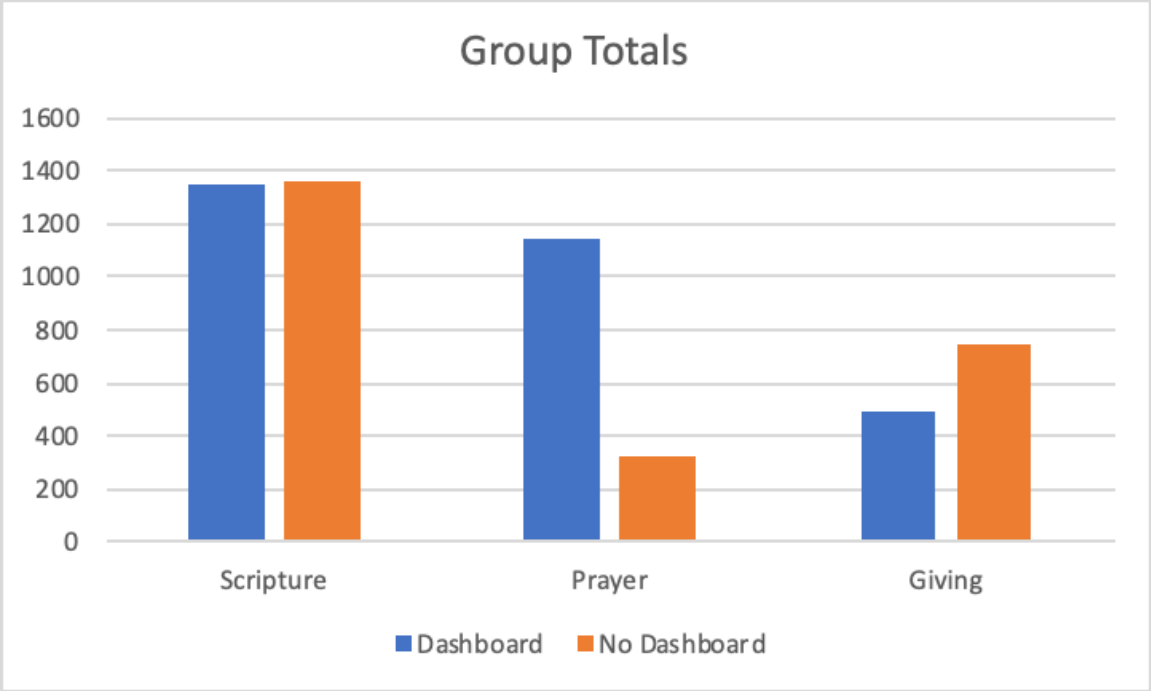
Figure 12.



(Total amounts of scripture, prayer and giving per non-dashboard and dashboard [*] participant)

Participant 8 (887 verses) had the highest amount of scripture verses read using the Bible App. Participant 3 (30 verses) had the lowest amount of scripture verses read using the Bible App. Participant 4 (532 minutes) had the highest amount of minutes using the Abide App. Participant 8 (58 minutes) had the lowest amount of minutes using the Abide App. Participant 3 (380 dollars) self-reported the highest giving amount. Participant 1 (5 dollars) and Participant 2 (1 dollar) self-reported the lowest giving amounts.

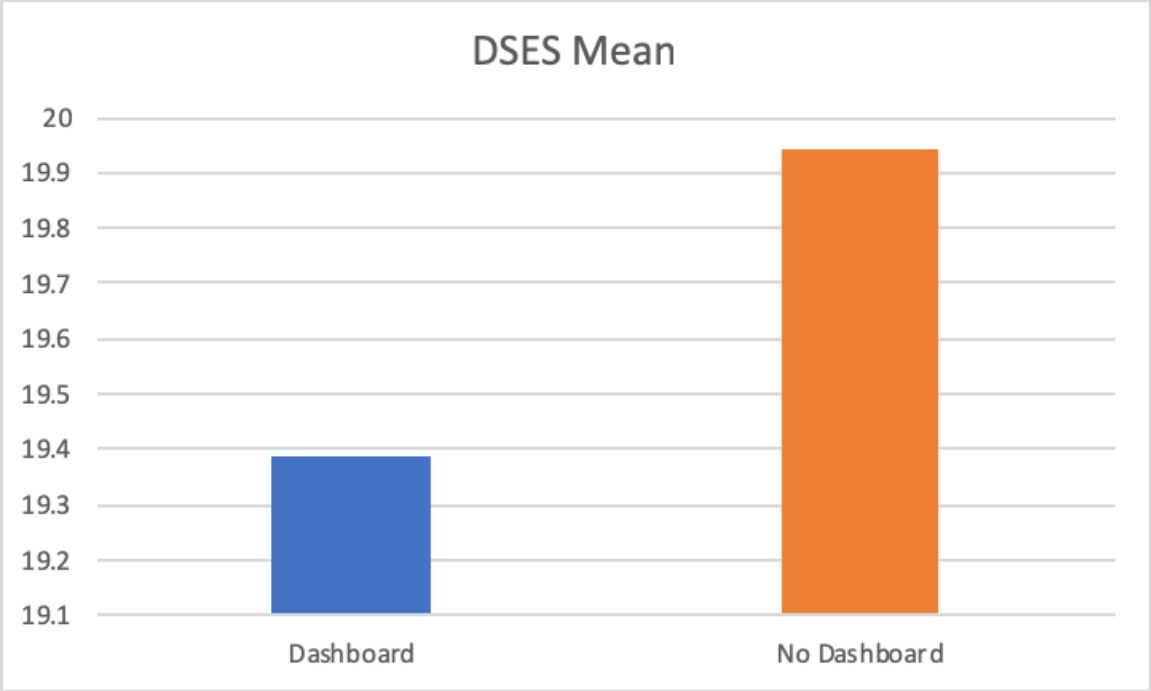
Figure 13.



(Group totals for dashboard and non-dashboard users)

The group that used the dashboard read slightly less scripture (1343) than the group that did not use the dashboard (1361).

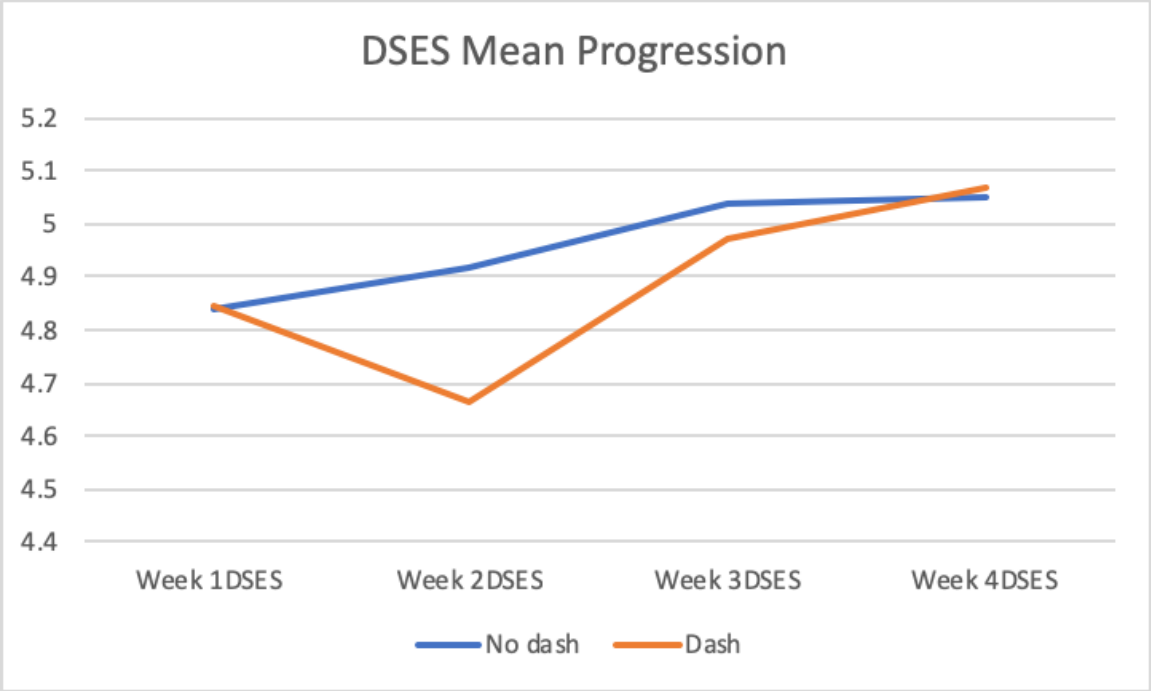
Figure 14.



(DSES Survey mean totals for dashboard and non-dashboard groups)

The group that did not use the dashboard had a higher DSES mean collectively 19.94 versus 19.39 for the group that used the dashboard.

Figure 15.



(DSES Mean comparison for each group)

The DSES means of both the dashboard and non-dashboard users increased over the course of the study. The group that did not use the dashboard stayed slightly more constant over the course of the study. However, the DSES mean of the group that used the dashboard peaked slightly higher after a more dramatic decrease.

Chapter 5: Discussion and Conclusion

The purpose of this research project was to explore how an interface of connected applications effects the level of spiritual practice for congregants in the Christian faith. The Cultural Studies and Religious Social Shaping Technology frameworks were used to explore the effect that the integration of religion and media has on dashboard users. Therefore participants in this study used three different techno-spiritual focused phone applications centered on three tenets of the Christian faith which are scripture reading, prayer and tithing. The YouVersion Bible is a scripture reading application, the Abide is a prayer application and Givelify which is a monetary giving application. A high-fidelity, interactive dashboard prototype displayed individual participant data showing how many scripture verses, how many minutes of prayer and how many dollars were given using the techno-spiritual applications. Participants also used the Daily Spiritual Experience Scale (DSES) survey to measure day-to-day spiritual experience. Each day participants reported app activity answering how many scripture memory verses they read, how many minutes they prayed and how much they gave monetarily.

The Mann-Whitney test was used to determine the statistical significance of the results of this study and descriptive statistics were used to analyze the resulting data. It was found that the group that used the dashboard read less scripture (1343) than the group that did not use the dashboard (1361) largely due to Participant 8's high amount of bible intake (887 scriptures read) which was highest among all participants. The group

that used the dashboard reported higher sums in every other category. Without the anomaly of highest scripture reported, the group that used the dashboard had higher sums in all categories reported. The group that did not use the dashboard had a higher DSES mean collectively, 19.94 versus 19.39 for the group that used the dashboard. The group that did not use the dashboard also included the 2 participants with the highest reported DSES mean. It was also found that the DSES means of the dashboard users increased over the course of the study and the group that did not use the dashboard stayed more constant over the course of the study. The DSES means of both the dashboard and non-dashboard users increased over the course of the study. Based on this data, it is found that there is no statistical evidence that an interface of connected applications has an effect on the level of practice for congregants in the Christian faith.

The major findings of this study were that there is no evidence that an interface of connected applications has an effect on the level of practice for congregants in the Christian faith. Additionally, 75% of participants showed increasing weekly DSES means after using the dashboard. Finally, it was determined that using dashboard made things neither worse nor better based on the data collected in this study.

Limitations

There were limitations during this study. First, the self-reporting method that was used during the study runs the risk of returning results that were different from true

participants activity. This susceptibility must be considered although the DSES scale is widely used to account for the spiritual experience of participants.

The information included in the literature review of The Bible App, Abide App and Givelify App are derived from sources with vested interest in the success and positive narrative of the applications. Although the review included in this study was focused on general information about features and affordances, the researcher acknowledges the potential for bias. The researcher included evaluative research material that was not reported from the app creators, and further acknowledge there is a need for more research that objectively reviews techno-spiritually focused applications.

Additionally, the scope of the study was limited to a small sample size. The results of the study represents a sample of a small group of 5-8 people who have joined together for a designated period of time for the purpose of engaging in reading scripture, prayer and monetary giving using mobile applications. The researcher used a p value of $P<0.01$ instead $p<0.05$ in the study as a benchmark during statistical analysis to determine if there was statistical significance to account for any biases and to avoid the likelihood that a false positive was returned in results.

Unanticipated challenges were also encountered during the study. Certain participants opted to use text message based giving for their giving practice. The researcher acknowledges this difference. One of the participants was in the control group and the other was in the experimental group. The researcher determined that this change

for the two participants would not have any impact on the results. The process for these two participants was largely the same as other participants. All participants used a mobile device's application to complete monetary giving because text messaging on Android and iPhone devices are accessed through mobile applications.

The dashboard used in this study was delivered to users as an interactive prototype that revealed summarized individual data totals on a weekly basis rather than as they entered it. Therefore participants did not have the opportunity to make behavior adjustments based on real-time totals or continuous data feedback. Solutions to this can be addressed in future research by building a prototype that exposes data to the participants through a live web application that aggregates data from applications automatically.

Lastly, the study had a potential confound of Hawthorne effect. There was the possibility that behavior of participants could have increased or decreased because of the perception that it was being observed by the researcher. Future studies could further control this by conducting a double-blind experiment and expressing to each participant that their identities would be concealed. The researcher would not know how much they used the applications to encourage further levels of trust and comfort and the participants would not be aware of others involved in the study.

The theory of connected techno-spiritual applications

The researcher has read the literature extensively and found that faith groups have a distinct set of interests that are specific to their belief systems and exhibited in their spiritual practices. This is outlined in Chapter 2 and was considered in the design of this study. The techno-spiritual applications considered in this study, The Bible app, Abide Prayer app and the Givelify App represent three major tenets of the Christian faith. The theory of connected applications states that techno-spiritual applications that exhibit affordances representative of the spiritual practices of a group can be connected through a dashboard and through its use can enhance the spiritual experiences of its participants.

This work begins to leverage the techno-spiritual ecosystem for techno-spiritual experiential purposes. It explores the use of techno-spiritual applications and shows that the use of a techno-spiritual application ecosystem can increase the daily spiritual experience of a group that utilizes the techno-spiritual applications representative of the tenets of that groups belief system. The non-denominational Evangelical Christians who participated in this study value scripture reading, prayer and monetary giving and the study showed that when users value the tenets that an application affords, the spiritual experience of the users will increase. What has emerged from this study is eco-systemic due to the network of existing techno-spiritual applications that have been created and their categorical nature. When techno-spiritual applications are networked within a

dashboard, each independent entity becomes an integral part of a system of inter-reliant parts designed to effect the spiritual practice and experience of its users.

Secondly, a techno-spiritual application ecosystem has been created based on this new research as a continuation of previous studies. There are a wide range of techno-spiritual occurrences that have been found in previous research that reinforce the idea that there is an ecosystem that exist where technology is being used for religious and spiritual purposes (Kang, 2019, pg. 20). Each sect of religions around the world and the affordances its techno-spiritual devices project are unique and specific. Religious traditions modify techno-spiritual affordances based on their unique standards and requirements as seen with the emergence of various new technologies around the world. When techno-spiritual applications accurately facilitate the spiritual practices they represent, a foundation is created to utilize techno-spiritual application ecosystems based on the major tenets of faith groups that can be accessed through dashboards, as seen in this study. For instance, the components of the Muslim value and belief system that have been translated to applications potentially could be integrated in a dashboard and tested. This is also true for other faith traditions that have techno-spiritual applications with valued affordances. A dashboard of applications could potentially effect the intrinsic motivation for individuals within faith groups to increase or decrease their levels of scripture reading, prayer time and monetary giving using techno-spiritual applications.

This study expands on previous work by focusing on the effect that the joint affordances of techno-spiritual applications have on its users. It builds from the classification studies of Campbell and Bellar exploring the effect of a combination of these techno-spiritual applications on spiritual experience. Bellar and Campbell plotted techno-spiritual application patterns and found that these apps are designed based on spiritual content and practices. It also focuses on applications that offer scripture reading, prayer and monetary giving which are spiritual practices. Categorization of techno-spiritual applications can provide subject areas to potentially select from in the next iterations of techno-spiritual dashboards where users are able to select from different areas of practice to determine which techno-spiritual applications they would like to focus on.

This study also extends previous work that focuses on single applications and link that work together to explore the broader effect that these techno-spiritual applications have on their users. It also lays a foundation for dashboards and connected applications in the techno-spiritual domain. To date the researcher has found no evidence of research that explores how multiple applications effect the spiritual discipline of congregants in the Christian faith when their affordances are harnessed within a dashboard.

Future Research

It is worth exploring in future research whether building micro-interactions or elements of gamification that encourage participants to engage more with the apps would

increase their levels of practice. Psychology based research has found that when gamification elements such as points, leaderboards and levels are instituted in interfaces, it can meaningfully increase performance and intrinsic motivation (Mekler, 2013, pg. 70). Additionally, it has been found that performance has increased in research participants that were given a defined goal (Mekler, 2013, pg. 70). More research is needed in this area, especially in the techno-spiritual field.

To date the researcher has found no evidence of research that explores how multiple applications collectively effect the spiritual practice of congregants in the Christian faith despite increases in the creation and use of techno-spiritual applications. This study explored how an interface of connected applications affects the level of practice for congregants in the Christian faith through the use of a dashboard. It required participants to self-report daily use of scripture, prayer and monetary giving focused applications. There is opportunity for future research to complete a similar study using a dashboard that accurately aggregates data from these applications automatically without user reporting. This will eliminate the need for self-reporting and discourage potential bias. The data collected was self-reported. Therefore, the data is susceptible to exaggeration, omittance of results or telescoping. This method of aggregating data for the future study could also use an interactive process to test the usability of the dashboard.

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Appendix A: Consent Form

Consent for Participation in Research Activities

Project Title: Examining how an interface of connected applications affects the spiritual discipline of congregants in the Christian faith

You are being asked to participate in a 28 day research study conducted by Perry Sweeper, a doctoral student at the University of Baltimore. Please make sure you understand the information below before you sign this document.

1. Purpose of this research
The purpose of this research is to explore how an interface of connected applications affects the spiritual discipline of congregants in the Christian faith.

2. Procedures
As a part of this 28 day study, you will be asked to use three spiritually focused applications.
You may also be asked to use a dashboard that shows how many times you read scripture, how many times you gave monetarily and how long you prayed using the apps on a daily basis. Lastly, you will be asked twice a day to take a survey used to measure your daily spiritual experience. Further, instructions will be provided to you orally as well as in a hard copy format.

3. Voluntary Participation
Your participation in this study is voluntary. You have the right to withdraw from the study at any time without consequence.

4. Privacy & Confidentiality
All personally identifiable information learned and collected in this study will be strictly confidential. All data collected in this study will be securely stored on the University of Baltimore's network protected Google Drive storage system. Only the investigator and members of the research team will have access to these records. Your responses will be identified by a study code number only. Your name will NOT be used for any portion of this study. If any information is published, there will be no information that would identify you as a participant.

By signing this form, you agree to allow the research study investigator to make the records, which shall remain anonymous, available to the University of Baltimore Institutional Review Board (IRB) and regulatory agencies as required by law. Consenting to participate in this research indicates your agreement that collected information may be used by current and future researchers in such a fashion that your personal identity will remain protected. Such use will include sharing anonymous information with other researchers for checking the accuracy of study findings and for future approved research that has the potential for improving human knowledge.

5. Potential Risks and Benefits
Your participation in this study does not involve any personal risks. All information obtained from the session notes will remain strictly confidential and are used solely to evaluate the application itself, not the participant.

Your participation in this research will help provide invaluable feedback on whether the availability of a dashboard affects perception of spiritual experience.

By signing below, you are agreeing to participate in a research study. Be sure that any of your questions about the study have been answered to your satisfaction, and that you have a thorough understanding of the research. If you have other questions or concerns about the research project, you may contact the Principal Investigator, Perry Sweeper at (e) perry.sweeper@ubalt.edu, or the Faculty Sponsor, Dr. Deborah Kohl at (e) dkohl@ubalt.edu. For questions about your rights as a participant in this research study, contact the UB IRB Coordinator: 410-837-6199, irb@ubalt.edu.

6. Permission to Record

I have read this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's Signature: _____ Date: _____

Printed Name: _____ Date: _____

Participant Age: _____

Investigator's Signature: _____ Date: _____

Appendix B: DSES Permission Form

Daily Spiritual Experience Scale Registration Form

By affixing your name to this form you agree to include:

"© Lynn Underwood www.dsescale.org permission required to copy or publish"
on any copies of the scale you distribute, print or publish.
You also agree to appropriately cite one of the papers below in your publication of results:
Underwood, L.G. (2006) Ordinary Spiritual Experience: Qualitative Research, Interpretive Guidelines, and Population Distribution for the Daily Spiritual Experience Scale. *Archive for the Psychology of Religion* 28:1, 181-218
Underwood L.G. (2011) The Daily Spiritual Experience Scale: Overview and Results. *Religions*; 2(1): 29-50.

If you are using the open-ended form or checklist form of the scale, contact me for a copy with the appropriate acknowledgments.

www.dsescale.org contains an accurate form of the scale and additional information. It is the best source for updated information about the scale. Scoring information can be found in Underwood (2006) and Underwood (2011).

In submitting this registration you agree to keep Lynn Underwood informed of uses of the scale, results from your work, and publications and presentations that come from use of the scale. lynn@lynnunderwood.com and you are giving permission for Lynn Underwood to send you occasional updates related to this work.

Your full name and title: Perry Sweeper, doctoral candidate

Your email address(es): psweeper@gmail.com

College/ University/ Other Organization: University of Baltimore

Full Address, including city and country
1420 N. Charles St., Baltimore, MD 21201, USA

Date: 9/26/18

Reason for use of the scale and/ or study description. Give details.
The project that I am working on is a dashboard that displays user data from apps that promote spiritual discipline in one place. I am testing whether this dashboard affects the spiritual experience of the participants. I would like the participants in this study to take the DSES daily while using this dashboard to assess their spiritual experience during the study.

Is this work supported by a Research Grant or other support? N

Is your work for profit? N

How did you find the scale and my contact information? Library research

Which language version of the scale are you using? English

How many individuals do you expect to administer the scale to? 15

Appendix C: Daily Spiritual Experience Scale

		Many times a day	Every day	Most days	Some days	Once in a while	Never or almost never
1*	I feel God's presence.						
2	I experience a connection to all of life.						
3	During worship, or at other times when connecting with God, I feel joy which lifts me out of my daily concerns.						
4*	I find strength in my religion or spirituality.						
5*	I find comfort in my religion or spirituality.						
6*	I feel deep inner peace or harmony.						
7	I ask for God's help in the midst of daily activities.						
8	I feel guided by God in the midst of daily activities.						
9*	I feel God's love for me directly.						
10*	I feel God's love for me through others.						
11*	I am spiritually touched by the beauty of creation.						
12	I feel thankful for my blessings.						
13	I feel a selfless caring for others.						
14	I accept others even when they do things I think are wrong.						
15*	I desire to be closer to God or in union with the divine						

		Not close	Somewhat close	Very close	As close as possible
16	In general, how close do you feel to God?				

© Lynn Underwood – contact author to register to use scale http://www.dsescale.org/ or lynnunderwood@researchintegration.org;

* signifies items that were used to form part of the BMMRS 6 item scale, DSE domain. 4 and 5 was combined: "I find strength and comfort in my religion." And 9 and 10 was also combined: "I feel God's love for me directly or through others." These form part of the 6 item DSES referred to in the text.