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## EXPLORING THE PSYCHOLOGICAL BENEFITS OF USING AN EMERGING VIDEO TECHNOLOGY TO COACH AND RETAIN DOCTORAL LEARNERS

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June Maul*	Grand Canyon University, Phoenix, Arizona, USA	<a href="mailto:June.Maul@my.gcu.edu">June.Maul@my.gcu.edu</a>
Ronald Berman	Grand Canyon University, Phoenix, Arizona, USA	<a href="mailto:Ronald.Berman@gcu.edu">Ronald.Berman@gcu.edu</a>
Cathrine Ames	Grand Canyon University, Phoenix, Arizona, USA	<a href="mailto:Cathrine.Ames@gcu.edu">Cathrine.Ames@gcu.edu</a>

\* Corresponding author

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### ABSTRACT

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Aim/Purpose	Retention of doctoral students, particularly during the dissertation stage, has been a decades-old concern. The study examined the value of dissertation chairs' use of a cloud-based video technology for coaching doctoral students, and its influence on psychological factors previously linked to retention. The psychological aspects included social presence, research self-efficacy, social isolation, and motivation.
Background	Prior research identified the importance of addressing psychological factors that lead to student retention and the development of future researchers capable of producing quality research.
Methodology	An exploratory case study included a survey of dissertation chairs, interviews of dissertation chairs and doctoral students, and review of documents and artifacts in a university in the southwestern United States.
Contribution	The findings revealed several aspects of the video technology that dissertation chairs and their doctoral students identified as valuable from a psychological perspective, and there were several unexpected findings.
Findings	Coaching using an emerging video technology positively influenced psychological factors leading to improved research self-efficacy, scholarly writing, efficiency and effectiveness of the academic coaching process, which resulted in student retention. Students identified the relationship established with their dissertation chair while using video technology led to their decision to remain in the doctoral program.

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Recommendations for Practitioners	Use coaching opportunities to develop research self-efficacy as well as to increase social presence, which will help reduce social isolation and increase student retention.
Recommendations for Researchers	Integrate emerging cloud-based video technologies for conducting research to engage multiple researchers at different locations.
Impact on Society	This virtual coaching approach can improve the research capabilities and retention of doctoral students in today's online world during the dissertation phase.
Future Research	To validate the relationships found in this study, future research should focus on the quantitative aspects of the psychological factors identified in this study.
Keywords	emerging technology, video meeting technology, virtual coaching, doctoral student coaching, doctoral student retention, social presence, research self-efficacy, social isolation, intrinsic motivation, web conferencing

## INTRODUCTION

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Historically, retention of doctoral students has been problematic, and attrition intensified as online doctoral programs in the United States proliferated. Studies showed that attrition of doctoral students has been between 40% and 70% for decades (Bowen & Rudenstine, 1992; Gardner & Gopaul, 2012; Lovitts, 2001). The reasons for student departure are multifaceted. Psychological factors such as lack of social presence, research self-efficacy, and intrinsic motivation, coupled with a sense of isolation, can hinder or, if remedied, support doctoral students. There is no lack of research indicating the importance of psychological factors such as social presence (Gunawardena & Zittle, 1997; Short, Williams, & Christie, 1976), research self-efficacy (Coryell & Murray, 2014; Wei, Barnard-Brak, & Wang, 2015), isolation (Golde & Dore, 2001; Hawlery, 2003; Lovitts, 2001), and intrinsic motivation (Deci & Ryan, 2000; Gardner, 2010). Thus, academic knowledge is not the only indicator of doctoral success; psychological factors can also propel doctoral students to complete a doctoral degree.

Video-conference-based coaching is another approach that may facilitate online doctoral student success, particularly during the dissertation stage as the doctoral students work independently to produce scholarly research. Effective communication with dissertation chairs enables research self-efficacy in doctoral students (Coryell & Murray, 2014; Lambie, Hayes, Griffith, Limberg, & Mullen, 2014; Mason, 2012). Research self-efficacy helps doctoral students develop the skills necessary to produce quality research, enabling progress toward degree completion. Video conferencing allows graduate students to interact more efficiently (Akarasriworn & Ku, 2013; Yob & Crawford, 2012), which is important because interaction facilitates higher levels of social presence (Borup, West, & Graham, 2012; Sivunen & Nordbäck, 2015). Social presence facilitates a connection between the doctoral students and their dissertation chairs, which may be motivational for students. Intrinsic motivation is essential for doctoral student success (Lovitts, 2005; Spaulding & Rockinson-Szapkiw, 2012). Self-determination is more likely to occur when individuals believe in their capacity to complete a task, and a video meeting between a doctoral student and their dissertation chair can enable research confidence. In addition, previous researchers suggested that video conferencing reduced isolation (Akarasriworn & Ku, 2013) and improved engagement (Borup et al., 2012; Foronda & Lippincott, 2014) in graduate students. Given the connective powers of video technology, it is reasonable to speculate that video technology may help mitigate barriers that online doctoral students encounter. The more interesting question is what the real benefits are, from a psychological perspective, of using an emerging global video technology via a computer or a cell phone for coaching dissertation students. The current study explores the perceived value of the use of Zoom global conferencing technology from the perspectives of the doctoral students working on their dissertation and their dissertation chairs.

## LITERATURE REVIEW

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### *NONTRADITIONAL DOCTORAL STUDENT BACKGROUND*

Nontraditional online doctoral education is steadily growing, necessitating the creation of adaptive learning environments to address distinct challenges. Traditional doctoral students are typically full-time learners who attend classes on campus. In contrast, nontraditional online students are often working adults with families (Offerman, 2011). Existing literature substantiates that experiences of nontraditional students vary greatly from those of traditional students. Nontraditional students are working professionals, and they do not have time to languish over lengthy projects (Bennett & Folley, 2014). Time constraints add limitations, which may be problematic when added to the impediments of an online environment. Nontraditional learning often occurs in a virtual environment rather than a traditional on-campus classroom setting (Kumar, Johnson, & Hardemon, 2013; Terrell, Snyder, Dringus, & Maddrey, 2012); therefore, interaction with faculty is limited (Moore & Kearsley, 2012; Zahl, 2015), which may result in feelings of isolation (Jones, 2013; Lovitts, 2001; Radda, 2012). Providing a flexible environment that promotes interactivity with faculty can help meet the unique needs of contemporary, nontraditional students. Feeling connected to faculty increases doctoral persistence (Spaulding & Rockinson-Szapkiw, 2012). Thus, in the twenty-first century, it is essential to find approaches that allow nontraditional students to interact with faculty to improve their persistence, particularly as they enter the dissertation stage.

### *ISSUES DURING THE DISSERTATION*

The majority of doctoral programs in the United States require a dissertation, which is, in essence, a lengthy and multifaceted research project. A dissertation in the United States is tantamount to a thesis in other countries. The dissertation process is complex (Bennett & Folley, 2014; Jones, 2013; Martinsuo & Turkulainen, 2011), and the dissertation stage is likely to be the most challenging part of degree completion because students in the dissertation phase must transition from structured teacher-led courses to independent research (Spaulding & Rockinson-Szapkiw, 2012). Unlike coursework, the dissertation requires creating new knowledge rather than consuming knowledge (Baker, Pifer, & Flemion, 2013; Gardner, 2009; Lovitts, 2001). Students in the dissertation stage face a myriad of issues as they endeavor to improve their research skills and add new knowledge to their field of study by conducting original research. Multitudes of challenges exist in the dissertation stage such as topic selection, dissertation committee compatibility, understanding new technology, conducting statistical analysis, and scholarly writing (Spaulding & Rockinson-Szapkiw, 2012). Understanding how to navigate the uncertainties of the ambiguous dissertation stage, and transitioning from students who are accustomed to structured courses, to autonomous researchers, is difficult for novice researchers. Novice doctoral students must learn to conduct independent research, which presents challenges that can lead to doctoral attrition (Ewing, Mathieson, & Alexander 2012). Compelling empirical evidence shows the dissertation phase is challenging, and students are often unsure how to progress through the dissertation.

The distinctive needs of students who are in the dissertation stage necessitate finding approaches that help mitigate obstacles that arise. Failure to address issues that impede dissertation progress can lead to attrition. Improving the dissertation experience for doctoral students presents multidimensional concerns for students and their dissertation chairs. A study of 27 doctoral students conducted at 27 universities showed that the doctoral process was confusing, and frustration occurred when students experienced slow faculty responses (Terrell et al., 2012). Barriers for online students can be exacerbated, as they do not have the advantage of face-to-face interactions and coaching providing immediate and clear feedback. Many doctoral students in the dissertation stage are online students who are geographically distributed, which limits their access to faculty and peers. In addition to the challenge of learning how to conduct autonomous research to complete a dissertation, doctoral students frequently experience isolation during the dissertation stage.

The physical separation of online doctoral students may reduce engagement, leading to feelings of isolation. Isolation is common among doctoral students and feelings of isolation can result in attrition (Ali & Kohun, 2007; Gardner, 2010; Rovai, 2002). Most communication between the student, dissertation chair, and dissertation committee occurs online (Kumar et al., 2013; Terrell et al., 2012), resulting in feelings of student isolation (Lovitts, 2001; Radda, 2012), which may lead to lack of persistence (Rovai, 2002). Further, lack of engagement and feelings of isolation may inhibit intrinsic motivation, hindering progress.

Motivation, which can be either intrinsic or extrinsic, is instrumental in doctoral degree completion. Extrinsic motivation originates from external sources such as rewards; conversely, intrinsic motivation derives from an inherent interest (Lovitts, 2008). Intrinsic motivation is fundamental to earning a doctoral degree (Lovitts, 2005; Spaulding & Rockinson-Szapkiw, 2012). While students have different ambitions, they will only succeed if they are committed (Martinsuo & Turkulainen, 2011). Evidence shows that developing an academic relationship with their chairs, can increase student motivation and help them progress during the dissertation stage. Positive interaction between students and advisors increases student satisfaction leading to greater intrinsic motivation (Baker et al., 2013; Mason, 2012). Determining how to persist and navigate the uncertainties of the ambiguous dissertation stage is challenging for doctoral students.

### ***DOCTORAL PROGRAM SOLUTIONS USING VIDEO COACHING***

Employing video coaching to address the distinctive needs of online doctoral students can be a conduit to enhancing the academic experience between doctoral students in the dissertation stage and their dissertation chairs. The current study focuses on how a cloud-based video technology influences psychological factors that may impact doctoral students' success. The psychological factors are social presence, research self-efficacy, intrinsic motivation, and isolation. Social presence (Borup et al., 2012; Sivunen & Nordbäck, 2015), research skills (Bennett & Folley, 2014; Martinsuo & Turkulainen, 2011; Spaulding & Rockinson-Szapkiw, 2012), intrinsic motivation (Deci & Ryan, 2000; Gardner & Gopaul, 2012; Lovitts, 2001), and feelings of isolation (Ali & Kohun, 2007; Gardner, 2010; Lovitts, 2001; Radda, 2012; Rovai, 2002), may affect the doctoral student's ability to succeed. Cultivating the students' psychological needs using video technology to support coaching may enhance the online doctoral students' ability to persevere, particularly during the dissertation stage.

Using video technology as a coaching approach may strengthen collaboration between online doctoral students and their dissertation chairs, propelling students to persist in their program of study. Video conferencing is becoming more sophisticated (Foronda & Lippincott, 2014), and video creates opportunities to change the way universities educate students (Borup et al., 2012; Glassmeyer & Dibbs, 2012). Due to progress in bandwidth, HD video quality, and affordability, technology is more cost-efficient and accessible than in recent years. Advances in video technology provide opportunities for doctoral students and their dissertation chairs to go beyond the confines of an asynchronous setting. Research shows coaching and mentoring is essential during the dissertation stage, and video may facilitate not only coaching but also mentorship (Yob & Crawford, 2012). Developing a relationship with students improves the dynamics of student satisfaction, increasing motivation (Mason, 2012). Derived from an internal interest, intrinsic motivation is paramount to earning a terminal degree (Deci & Ryan, 1985; Gardner, 2009; Lovitts, 2001). Video technology provides an avenue for real-time interaction and rich dialogue, which is important when dissertation chairs are teaching, modeling, and facilitating the development of research skills in dissertation students. Although many barriers can derail the progress of online doctoral students, video-conference-based coaching is an approach that facilitates communication, offering a potential solution for addressing the psychological needs of online dissertation students.

### ***DEVELOPING RESEARCH SELF-EFFICACY***

Developing research self-efficacy enables the novice researcher to gain skills to integrate themselves with the scholarly community, conduct research, and make an original contribution to their field of study. New researchers may feel unprepared to carry out research (Coryell, Wagner, Clark, & Stuessy, 2013). Therefore, incorporating video technology during the dissertation process may help develop research skills in doctoral students, as dissertation chairs can offer real-time guidance. Video technology can provide support to students when they are stuck (Abrami, Bernard, Bures, Borokhovski, & Tamim, 2012), and receiving video coaching that enables role modeling from dissertation chairs may equip students to think more critically, enabling progression. Current advanced video features afford an opportunity for dissertation chairs and their students to expand the scope of the online environment to include immediate reciprocity, feedback, assistance, rich dialogue, role modeling, and fluid communication. In addition to improving research skills, video coaching may also enable social presence, which is another psychological factor that is critical in an online environment.

### ***IMPROVING SOCIAL PRESENCE***

Social presence, which refers to establishing an interpersonal connection in different communication mediums (Short et al., 1976), can be essential for dissertation students who communicate primarily in an online format. Online doctoral students face unique challenges (Rockinson-Szapkiw, 2012; Simonson, Schlosser & Orellana, 2011), and students learning at a distance may experience less access to faculty, resulting in communication problems. Social presence and connectivity influence online learning and student satisfaction, and video technology can improve student interactions (Borup et al., 2012; Sivunen & Nordbäck, 2015). Creating a collegial environment that enables rich communication can develop a foundation for success in students. Collaboration of faculty and doctoral students is a predictor of persistence in students (Lovitts, 2001). Thus, incorporating video coaching may aid in developing stronger social presence and intrinsic motivation, facilitating persistence toward degree attainment.

### ***REDUCING SOCIAL ISOLATION AND INCREASING INTRINSIC MOTIVATION***

Another benefit of using video technology for academic coaching is that it may help reduce feelings of social isolation in doctoral students. Common in doctoral students are feelings of isolation during the dissertation process (Ali & Kohun, 2007; Gardner, 2010; Rovai, 2002), which can decrease retention. Cultivating professional chair and student relationships using video may provide a means to mitigate feelings of isolation, generating greater student satisfaction, which may increase intrinsic motivation. Intrinsic motivation is essential for doctoral progression. Future postgraduate education is significantly impacted by motivation (Templeton, 2016), and educators need strategies to improve doctoral student perseverance (Allen & Seaman, 2011; Berman, Grant, & Markette, 2012; Gardner, 2009). Video coaching may offer doctoral students and dissertation chairs a rich mode of communication, which may reduce feelings of isolation, increase motivation, and create a positive trajectory, propelling students to persist.

### ***THEORETICAL FOUNDATION BASED ON PSYCHOLOGICAL FACTORS***

The need for this study originated from the ongoing issue of how dissertation chairs, using cloud-based video technology, can improve the development of psychological factors in nontraditional doctoral students. This study is guided by constructs found in several theories and models. The study explores how doctoral students and dissertation chairs indicate psychological factors may or may not be the basis for perceived value when using video technology while coaching dissertation students. The psychological factors are social presence, research self-efficacy, intrinsic motivation, and isolation. The social presence theory (Short et al., 1976), research self-efficacy theory (Holder, Barker, Meenaghan, & Rosenberg, 1999), student retention model (Bean, 1980), and connectivism theory (Downes 2005; Siemens 2005) serve as the theoretical framework for developing the research

questions querying how video coaching enables social presence, research self-efficacy, intrinsic motivation, and reduces feelings of isolation in doctoral students.

Social presence theory demonstrates the significance of social presence in virtual environments (Short et al., 1996, which may improve the relationship between doctoral students and their chairs by using video technology. Developing social presence between students and dissertation chairs enables a sense of connection in online settings. This improved interaction can aid in developing research competency, leading to stronger research self-efficacy. Research self-efficacy theory can have a positive impact on improving research skills and progress in doctoral students. Research proficiency is a precursor to degree completion because adept research abilities are a fundamental program requirement for students in the dissertation stage. The student retention model (Bean, 1980) offers a context for the correlation between student isolation and student attrition. Bean (1980) postulated that when students are not satisfied with their institution, that can impede completion. Building a rapport between dissertation chairs and students can lead to student satisfaction, resulting in persistence toward degree completion. Articulated in connectivism theory (Downes 2005; Siemens 2005) is the premise that learning is facilitated using collaboration enabled by technology. Connectivism accentuates using technology to work in fluctuating and vague environments, which provides a rationale for why video technology can be effective for online dissertation dyads. The dissertation phase is inherently ambiguous. The theories and models in this study offer a foundation for the research questions posed in this research that examine psychological factors in doctoral students.

### ***SUMMARY OF THE NEED FOR THIS RESEARCH***

Extant empirical literature reveals that the reasons for doctoral student departure are complex, and the process of how to develop researchers who can produce a quality dissertation needs further exploration. Although nontraditional doctoral students constitute a growing population in the United States, there is little empirical research about their experiences (Gardner & Gopaul, 2012). Consequently, more research is needed to determine how to increase retention in nontraditional doctoral students. Moreover, the growth in online nontraditional doctoral students has raised interest in how to facilitate their progress (Gooch & Watts, 2014; Hachey, Wladis, & Conway, 2012; Moore & Kearsley, 2012; Rovai, 2002). University leaders are seeking innovative ways to improve and foster collaborative environments that promote inclusiveness to enhance alignment (Holmes, Seay, & Wilson, 2010). Prior research demonstrated that understanding the relationship between the psychological dimensions affecting doctoral students could guide educators in how to support doctoral students when implementing video technology. Technology creates opportunities for supervision of doctoral students in online environments (Orellana, Darder, Pérez, & Salinas, 2016). There are disagreements on how to most effectively improve the progress of doctoral students, and indicators show dissertation coaching using video technology is one approach that may enhance the psychological factors that influence doctoral progress and retention.

Determining approaches to help retain doctoral students merits investigation, which offers a compelling argument for exploring video coaching with nontraditional doctoral students and their dissertation chairs. Several researchers recommend ongoing research in the areas of doctoral attrition, video experiences, and the relationship between the doctoral students and their dissertation chairs. For example, attrition in graduate programs is troubling (Bowen & Rudenstine, 1992; Gardner & Gopaul, 2012; O'Keeffe, 2013), and using advances in technology such as video-based coaching may support the needs of online nontraditional doctoral students. Video conferencing technology is now widely accessible and may assist in reducing barriers and better equip students to become more self-reliant scholars. Future research should investigate online collaboration using video tools (Akarasriworn & Ku, 2013; Yob & Crawford, 2012), and more research is needed in the area of doctoral student support (Rockinson-Szapkiw, Heuvelman-Hutchinson, & Spaulding, 2014). Dissertation chairs have an opportunity to encourage deeper thinking, permitting students to go beyond the con-

finer of the online environment. Further, there is limited research on online mentoring (Kumar et al., 2013). More research is needed to explore mentor and protégé perceptions of relational aspects (Eby et al., 2013). Similarly, Ewing et al. (2012) call for more research on models aimed at combatting the high attrition rates of graduate programs that are experiencing unprecedented growth. Video conferencing may help improve interaction between students and their dissertation chairs, bridging the geographic and psychological distances that may impede the progress of nontraditional doctoral students.

### ***PURPOSE OF THE STUDY***

The purpose of this exploratory single case study was to identify the perceived value of the use of Zoom, a new generation of cloud-based global video technology, for dissertation chairs to coach and mentor doctoral students. This case study focused on identifying the value that dissertation chairs and doctoral students perceived they obtained from video-based coaching and mentoring. The research questions focused on the perceived value of Zoom video conferencing from a psychological perspective, including an increase in social presence, research self-efficacy, motivation, and decreased social isolation, which have been previously linked to doctoral student retention.

The next section will discuss the methodological approach used in this study. This research methods section will be followed by a section that presents the findings. Following the findings section will be a discussion and then a conclusion. First, the research methods section presents the design and research questions. Second, the university, the study participants, the cloud-based global meeting technology, and the research team structure are described. Third, the methods section describes the various data sources used to collect the data for this case study. Fourth, the thematic analysis approach is presented.

## **METHODS**

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### ***DESIGN***

Since the focus of this study was to develop an in-depth understanding of a phenomenon, the researchers selected a qualitative approach. An exploratory single case study design provided the opportunity to develop a holistic perspective of how the dissertation chairs and their students used video technology during the coaching process. This approach also provided valuable information on how the use of this emerging cloud-based video conferencing technology used by dissertation chairs to coach doctoral students assisted in improving social presence, research self-efficacy, and intrinsic motivation, as well as reducing social isolation in the doctoral students. Although a case study design does not provide statistical generalization from its results, as with quantitative research, it does provide the ability to generalize the results from a theoretical perspective, termed analytical generalization (Yin, 2014).

It is important to identify the theoretical propositions as part of the research design (Yin, 2014). Three theoretical propositions framed this research. First, this case study shows how Zoom technology contributes to the development of social presence between dissertation chairs and their students. Second, the data gathered identifies how video technology can help improve research self-efficacy of doctoral students through academic coaching. Finally, a qualitative approach helped demonstrate how the use of technology with nontraditional online students would lead to a reduction in their feelings of social isolation as well as improvement in intrinsic motivation.

This case study investigated how the psychological dimensions of improved social presence, research self-efficacy, and intrinsic motivation, as well as reduced social isolation, as indicated by dissertation chairs and doctoral students, may or may not be the basis for perceived value of the use of video technology for coaching. This exploratory case study will provide the basis to conduct future quantitative research exploring the relationship between these psychological variables, and the effect of this

technology on these psychological variables. Exploratory case studies help identify possible causal relationships that may be further researched using quantitative studies (Yin, 2014). In addition, a case study design provides the opportunity to connect theory to the phenomenon being explored (Groenwald, 2004).

### ***RESEARCH QUESTIONS***

The following research questions, framed around the theoretical propositions and theoretical foundation models of social presence, research self-efficacy, social isolation, and intrinsic motivation, guided this research:

1. How do the chairs and their students perceive their use of Zoom video-based technology during coaching meetings increases social presence?
2. How do the chairs and their students perceive their use of Zoom video-based technology during coaching meetings increases research self-efficacy?
3. How do the chairs and their students perceive their use of Zoom video-based technology during coaching meetings reduces social isolation?
4. How do the chairs and their students perceive their use of Zoom video-based technology during coaching meetings increases intrinsic motivation?

### ***STUDY PARTICIPANTS***

The study participants were dissertation chairs and students in the College of Doctoral Studies at a university in the southwestern United States during 2015. Over 300 doctoral faculty overseeing nearly 1,800 students who were in the dissertation phase were targeted. A survey was sent to all the doctoral faculty. Sixty-five dissertation chairs completed the survey, which was a 22% return rate. Data from university systems were also used to screen for dissertation chairs who were using Zoom for coaching their students in the dissertation phase. As a result of this screening process, four dissertation chairs and four dissertation students were interviewed.

When conducting qualitative studies, it is appropriate to use purposive sampling with relatively small sample sizes. Patton (2002) contended that qualitative inquiry can use small sample sizes that are chosen purposefully. The focus of this qualitative study was to understand the nature of the phenomenon in detail. Therefore, a purposeful sampling strategy yielding eight interviews and 65 surveys was appropriate for the current study. According to Palys (2008), a purposeful sampling approach uses a strategic perspective in determining where the study will occur. One university with three doctoral programs including EdD, PhD, and DBA, served as the single organization for this single-case case study.

The research team identified the importance of obtaining a broad perspective of the utilization of the video technology and its value to dissertation chairs and students in the dissertation phase. As a result, the sample of four dissertation chairs and four doctoral students was purposefully selected from the group of doctoral chairs who used Zoom regularly, based on Zoom usage reports. The university archives the records of video usage of the dissertation chairs. The Zoom reports enabled the researchers to establish which dissertation chairs regularly used Zoom meetings each month. Another selection criterion was to include dissertation chairs who held Zoom sessions averaging over 30 minutes in length, indicating they were using Zoom for academic coaching and mentoring of doctoral students. The four dissertation chairs, who were selected to be interviewed based on their high usage of Zoom, identified four of their dissertation students with whom they used Zoom regularly for at least 6 months. An additional criterion for selecting the dissertation chairs was that they had successfully chaired multiple students to receive a doctoral degree within this university. An email to the dissertation chairs and students invited them to participate in the interviews.

## ***USE OF EMERGING TECHNOLOGIES BY THE UNIVERSITY IN THIS CASE STUDY***

The doctoral program at the study university used technology from the inception of the program to support the needs of its students and to facilitate relationships between the students and the doctoral faculty. Incorporating emerging technologies, such as the Doctoral Community Network (DC), helped enable the growth of novice doctoral researchers into independent learners (Berman et al., 2012). The Doctoral Community Network™ is a web-based academic community exclusively for doctoral students at the study university. The DC is a learner-driven, online scholarly community designed to help doctoral students successfully complete their dissertation and program of study. In a single virtual location, the DC provides a comprehensive catalog of support services to guide and assist new researchers as they learn the terminology, tools, and norms to become independent scholars capable of producing high-quality research. Students access timely content written by experts in the fields of quantitative research, qualitative research, and technology. Using a collaborative technology, the DC provides a mechanism for new researchers to receive feedback on prospective research ideas from a nationwide research community. More than 50% of the participants using the network indicated it helped them feel connected to other students and faculty. This provided promising results that the technology may help reduce isolation in doctoral students (Berman, Cross, & Radda, 2013).

Given the success of the DC Network, in 2014, the university expanded the DC Network to include support exclusively for doctoral students working on their dissertation. The university augmented the DC with private doctoral workspaces, enabling doctoral students to share manuscripts, track milestones, and communicate with dissertation committee members (Berman & Ames, 2015). Prior to developing the private doctoral workspace, the dissertation communications process was disjointed, limiting faculty and dissertation committee oversight. Faculty and students communicated almost exclusively through email, and faculty and dissertation committee members were unable to easily ascertain the doctoral student's progress and dissertation development. The private doctoral workspace was established to facilitate communication and progression of doctoral students as they interacted with their committee members and other involved faculty. The private doctoral workspace, which is unique compared to other reference and communication systems, was designed to support the needs of novice doctoral researchers who require assistance during the dissertation process. However, the DC Network did not provide the capability for video-based synchronous coaching of doctoral students or easy access to faculty by students.

The Doctoral Community Network and the use of a prior video conferencing service were implemented during the second year of the doctoral program. Three years later, Zoom video conferencing technology was selected to increase the quality of communication and connection between doctoral students, their dissertation chairs, and their dissertation committee members.

## ***SELECTION OF ZOOM FOR DISSERTATION COACHING AND THIS STUDY***

Leaders in the College of Doctoral Studies selected Zoom for a variety of reasons. A combination of unique features and applications made Zoom particularly valuable to the student and the dissertation chair for coaching and mentoring during the dissertation phase. Meetings could be set up and initiated without sharing personal information such as telephone numbers or personal emails, supporting participant privacy. Feature parity across multiple devices, including computers, notebooks, iPhone, and Android devices, enabled not only communication and collaboration between students and dissertation chairs but also simultaneous screen sharing and application sharing virtually anywhere and anytime over any device, supporting synchronous coaching virtually anywhere and anytime. A suite of collaboration tools supported the dissertation chair's coaching of their doctoral students with features such as a whiteboard and joint annotation of documents via any device.

This set of collaboration tools enabled the chair and student to conduct research together, further develop data analysis skills, and improve the quality of scholarly writing through the coaching pro-

cess. The dissertation chair could role-model critical thinking, scholarly writing, and research approaches in the virtual environment created in a Zoom meeting. As a cloud-based application, both the dissertation chair and the student could record and store a video of any meeting in the cloud, on their computer, or in their dissertation committee private portal on the Doctoral Community Network. The videos were used to provide students with the opportunity to review information from their dissertation chairs or dissertation committees. Also, dissertation chairs provided videos of information on conducting research or scholarly writing. Groups could be set up to facilitate instant chat and instant video meetings as well as create a virtual office for faculty with easy instant access to faculty by students. Initially, the selection of Zoom was based on its high quality and broad set of communication features. Ultimately, the use of all Zoom features by the dissertation chairs, dissertation committees, and students continued to evolve throughout the duration of this case study to meet the needs of the dissertation chairs and doctoral students.

The nature of the Zoom cloud-based video technology facilitates sharing complex information at a personal level with long-term impact. Dissertation discussions are often complex as doctoral students receive coaching from their chair and must take direction in areas such as conducting literature searches, synthesizing literature to develop their research plan, conducting data analysis, and developing the level of scholarly writing needed for publishing their dissertation as well as empirical articles. While other video conferencing technology options provide the shared screen and bi-directional audio conversation, they do not record the webcam video with HD quality facial expressions, showing both the dissertation chair and the student as collaborating throughout the dissertation phase. These recordings document not only the conversation, but also the overall tone of the conversation. In alternative video conference options, the absence of the webcam video reduces the effectiveness of the session recordings by not fully showing the natural and supporting communication dialogue that occurs.

Dissertations coaching can be enhanced by natural experiences made possible when using virtual cloud-based video technology. To achieve a natural setting, participants need to experience high-quality video, crystal clear audio, and crisp text. Zoom is a relatively new global cloud-based video meeting tool that provides opportunities for various forms of meetings using multiple applications over the Internet. Prior research identified potential benefits of video conferencing. Specifically, these studies demonstrated that using video conferencing leads to reduced isolation (Bennett & Folley, 2014), improved engagement (Borup et al., 2012; Kriner, Coffman, Adkisson, Putman, & Monaghan, 2015), and increased persistence (Maor, Ensor, & Fraser, 2015) in graduate students.

Although the features of cloud-based video technology have created value for its users, the proactive communication of expectations of its use have supported the successful implementation and the resulting changes in how dissertation chairs, dissertation committees, and students are expected to communicate and collaborate. The expectations associated with the Zoom technology were that faculty and students would use Zoom monthly for dissertation communication. Senior leadership in the university communicated the value of Zoom through ongoing messages, training, giving faculty free Zoom accounts, and providing supporting materials for the doctoral faculty. However, although there was anecdotal evidence on the value of Zoom, it was unknown how much value the Zoom technology added to the coaching of students by their dissertation chairs during the dissertation phase from the perspective of the dissertation chairs and their students.

### ***RESEARCH TEAM STRUCTURE: A GROUP OF STAKEHOLDERS***

The research team in this study was structured selecting one member from each of three dissertation stakeholder groups. Each of these stakeholder members brought a unique perspective. The first research member was a senior leader in the doctoral studies department, with responsibilities that included identifying and implementing technologies that add value to the stakeholders. The next research team member was an adjunct faculty member who was involved with the development of the doctoral program from its inception and uses Zoom regularly with dissertation students. The final

team member was a doctoral student in the dissertation stage, who experienced the use of Zoom with her dissertation chair and has focused on this video conferencing technology for her research. The use of Zoom for the interview process enabled the remotely located team members to be virtually present. The presence of the three researchers enabled each to view the interviews from their stakeholder role in the doctoral program. While one researcher conducted the interviews, the other members asked probing questions at the end of the interview. Each of the Zoom meetings was recorded using Zoom and stored for the research team to access. Having the videos recordings available provided the opportunity to review facial expressions and body language as well as the tone and emotion in the voices of the interviewees. The process used for this research study is a potential model for conducting future research in today's online world of global scholarly research.

### *DATA COLLECTION SOURCES*

Data collection occurred using six sources. The sources included the university database showing Zoom usage of meetings between dissertation chairs and doctoral students, interviews with four dissertation chairs, interviews with four doctoral students, a researcher-designed survey, review of artifacts and documents on Zoom usage within the university, as well as documents and artifacts on Zoom features and implementation. The first step in data collection included reviewing Zoom video meeting usage between dissertation chairs and their doctoral students. Zoom monthly usage records are in a database maintained by the university. Reviewing the archival Zoom usage data revealed the frequency and duration of Zoom meetings between dissertation chairs and students during a 6-month timeframe. From the group of identified dissertation chairs, the final four were selected based on the average length of the Zoom meetings being over 30 minutes, having at least one Zoom meeting each month with each student, and having multiple students who received their doctorate from this university. Analyzing the archival Zoom data enabled the researchers to identify and interview dissertation chairs and their students who demonstrated high Zoom usage.

A researcher-developed survey was created to collect demographic data on the dissertation chairs in the university as well as data on their use of Zoom with their doctoral students. The 19-item survey with 0-5 Likert style responses was sent to over 300 dissertation chairs. The survey comprised five sections: demographic information, specific ways faculty used Zoom with their doctoral students, monthly Zoom usage, and their willingness to participate in follow-up interviews. Questions on demographic information included age, gender, area of their doctoral degree, number of years coaching dissertation students, and number of students successfully coached to a completed dissertation. A second set of questions asked how often the chairs used Zoom to build a successful relationship with their students, provide feedback on dissertation deliverables, coach research skills, and coach writing skills. A third set of questions asked the dissertation chairs to report the average number of Zoom meetings they held with their doctoral students for coaching per month and the average length of those coaching meeting. The survey elicited responses that assisted the researchers to develop an understanding of not only how but also how often the dissertation chairs used Zoom for coaching that might lead to increased social presence, research self-efficacy, intrinsic motivation, and reduced social isolation.

The four psychological models, social presence, research self-efficacy, intrinsic motivation, and social isolation as well as the results of the survey were used to develop the initial research questions and the interview protocol for the dissertation chairs and doctoral students. The interview questions for dissertation chairs and students focused on identifying the perceived value and benefits of Zoom video technology during the dissertation process. The initial interview questions, based on the above four psychological models, used in each interview were: (1) What are the primary ways you, as a dissertation chair, use Zoom when coaching your doctoral learners? (2) How do you use Zoom to build a relationship between yourself as their dissertation chair and your doctoral learners? (3) How do you use Zoom to develop various research skills in your students, whether it is to research and review literature, to find theories and models for their theoretical foundation, to formulate their ten strategic

points for their research plan, or for data analysis? (4) As you use Zoom, not only for relationship building but also building research skills, how does the use of this technology influence your student's motivation? (5) As we often discuss, many doctoral learners in this non-traditional online environment feel isolated. How do you perceive your use of Zoom for coaching influences their feeling of isolation? (6) As you coach your doctoral students what do you believe are the most valuable aspects/capabilities of Zoom for this coaching process? For each of these questions, the wording was modified for use with the doctoral students. For example, the first question was: What are the primary ways your dissertation chair uses Zoom to build a relationship with you when coaching you through the dissertation process? A final question was asked of each person regarding other information they would like to add in terms of their perspective of the value of the use of Zoom.

Via Zoom, the authors conducted eight one-hour virtual interviews, enabling the participants to join at work or in a home office. The researchers used an interview protocol designed by blending guidelines from Blanchet and Gotman (2010). First, the interviewer provided the participants with an overview of the study and the process for the interview, which included various ethical considerations such as their ability to stop anytime during the call or withdraw anytime during the process. Second, the participants were introduced to the three researchers who were on the call. Third, a series of open-ended questions based on the research questions and the theoretical foundation model behind each research question were used to create a semi-structured interview. Last, probing questions solicited additional information. An open dialogue developed between the participant and the lead interviewer. The interviews were recorded and later transcribed. Sending the transcribed interviews to each of the interviewees for their review established the data validity through the process of member checking.

Various documents and artifacts were used to describe the case situation and to identify participants. These documents were used to select the participants; to provide information that described the use and implementation of Zoom in this university; and to describe the features that made Zoom unique and valuable as a video technology application for the use by dissertation chairs and their students for coaching in areas such as scholarly writing, research, and data analysis. The researchers also identified and reviewed various documents, including a training package available for dissertation chairs and students on the use of Zoom, and the instructional package sent to dissertation chairs when they joined the university.

### ***DATA ANALYSIS PLAN***

A structured data analysis plan using several data analysis approaches provided rich data from which to draw conclusions about the study findings. First, results of the 19-item survey were analyzed using descriptive statistics. Second, Zoom usage for dissertation chair meetings with their students was determined by calculating the monthly frequency and duration of Zoom usage by dissertation chairs for 6 months. Third, coding and thematic analysis of the dissertation chair and doctoral student interviews occurred. The thematic analysis identified the perceived value, from a psychological perspective, of Zoom video conferencing technology from the students' and dissertation chairs' perspectives. The resulting themes were used to answer the research questions. Further, the thematic analysis included comparing the perspectives of the dissertation chairs and doctoral students. Last, Zoom-related documents, artifacts, and training items were reviewed to develop the summary of the case situation as well as to describe the history of the use of technology in this case study and the rationale for the use of Zoom for coaching and the exploration of Zoom for this study.

A series of eight interviews with four dissertation chairs and four of their doctoral students were conducted to identify how dissertation chairs using Zoom to coach and mentor doctoral students influenced psychological factors related to student retention. Previous research indicated that psychological factors were important for retaining doctoral students, particularly online students. These factors included social presence (Borup et al., 2012; Gunawardena & Zittle, 1997; Sivunen & Nordbäck, 2015), social isolation (Akarasriworn & Ku, 2013; Yob & Crawford, 2012), research self-

efficacy (Coryell & Murray, 2014; Lambie et al., 2014), and motivation (Lovitts, 2005; Spaulding & Rockinson-Szapkiw, 2012). The interviews in the current study were conducted with doctoral faculty and their students to get perspectives from both stakeholders. The interviews built on results from the initial survey, and further explored how using Zoom influenced the psychological factors of non-traditional online students.

Thematic analysis for this case study used a combination of a structured approach along with a creative approach. The structured approach, based on case study analysis from Merriam (2009), involved reading through all the interviews to become familiar with the data and to identify potential codes to be used based on the research questions and the theoretical models behind the research questions (Merriam). Once all the transcripts had been reviewed, each transcript was read carefully and coded, focusing on one research question at a time. As codes were developed, they were entered into a codebook. Once all the data were coded, the codes were put on sticky notes, and the more creative approach began. Themes were developed from the codes by using sticky notes to arrange the data visually. Yin (2014) suggests that finding patterns from data involves playing with the data. Codes were moved around and combined to create various categories with a focus on answering each research question. These resulting categories were named and a description for each one developed. The resulting category along with its name and description became the themes. These resulting themes were used to answer the four research questions. Next, the data were examined to look for additional codes that might cut across the research question or that provided unexpected results. Finally, the resulting themes were summarized in table format to allow for a comparison of the results between the dissertation chairs and the doctoral students. Once all the themes were developed, they were further examined for linkages based on the dialogue in the interview and used to create a visual model.

## FINDINGS

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### *CASE SITUATION SUMMARY*

Exploring the use of Zoom, a cloud-based video technology used by doctoral faculty and doctoral students during the dissertation phase, this single case study included three applied doctoral programs, EdD, PhD, and DBA. The study was conducted at a private university in the southwestern United States. The study was approved through the university's IRB process. These relatively new doctoral programs had experienced significant growth, increasing from approximately 1,000 students to over 5,000 students in 6 years. The doctoral program, which offered ground and online options, comprised mainly online nontraditional students located predominantly in the United States but also globally. During the dissertation stage, former ground students became online students, since their dissertation committees were dispersed throughout the United States. Thus, communication was initially during the first few years of the program through email and telephone. As with other doctoral programs, there were challenges with the rapid growth and the increasing size of the program. Challenges included serving nontraditional students dispersed throughout and outside of the United States, developing academic research and scholarly writing skills in online students, facilitating relationships between students and their dissertation chairs, and developing scholarly researchers who were equipped to complete their research. This university had used emerging technologies, such as social networking, since its inception to improve communication and collaboration between dissertation chairs and doctoral students. Zoom was selected as a video-based technology because of the unique capabilities it provided as an emerging cloud-based video technology to further enhance the level of communication and collaboration during coaching as well as to improve the quality of doctoral research. Senior leadership in the university communicated the value of Zoom through ongoing messages, and supported its implementation. Although some dissertation chairs and doctoral students provided anecdotal evidence on the value of Zoom, it was unknown how much value the Zoom technology added to the coaching of students by their dissertation chairs during the disserta-

tion phase from the perspective of the dissertation chairs and their students. This need led to the development of this exploratory case study.

### ***DEMOGRAPHICS OF SURVEY PARTICIPANTS***

Survey participants included 65 dissertation chairs (64% female; 36% male; 62% PhD, 29% EdD; 2% DBA, 7% other). The majority were female EdD dissertation chairs, who had varying degrees of doctoral chair experience. Half of the respondents were dissertation chairs at the current university for less than a year, and almost half of the respondents were dissertation chairs at the present university between 2 and 5 years. Only a small percentage, 8%, of the respondents were dissertation chairs at the university for 6 or more years. The majority of dissertation chairs, 73%, had one doctoral student or none who had completed a doctoral degree at the current university, 20% had two to five graduates, and 7% had six or more doctoral graduates. This data indicated that several of the dissertation chairs had limited experience coaching dissertation students at the study university. The data also reflected that the doctoral program was relatively new; the program had been in place for six years at the time of the study. Table 1 displays demographic information in more detail. Demographics on ethnicity were not collected which was a limitation of this study.

**Table 1. Faculty demographic information**

	Responses ( <i>n</i> )	Percent %
Gender		
Male	22	36.07
Female	39	63.93
Doctoral Degree		
PhD	38	62.30
EdD	18	29.50
DBA	1	1.64
Other	4	6.56
Years as Doctoral Chair at Current University		
0-1	30	49.18
2-5	26	42.62
6-9	3	4.92
10 or more	2	3.28
Students Chaired Who Completed Doctoral Degree at Current University		
0-1	45	73.77
2-5	12	19.68
6-9	21	4.92
10-13	1	1.63

### ***SURVEY RESULTS OF ZOOM USAGE***

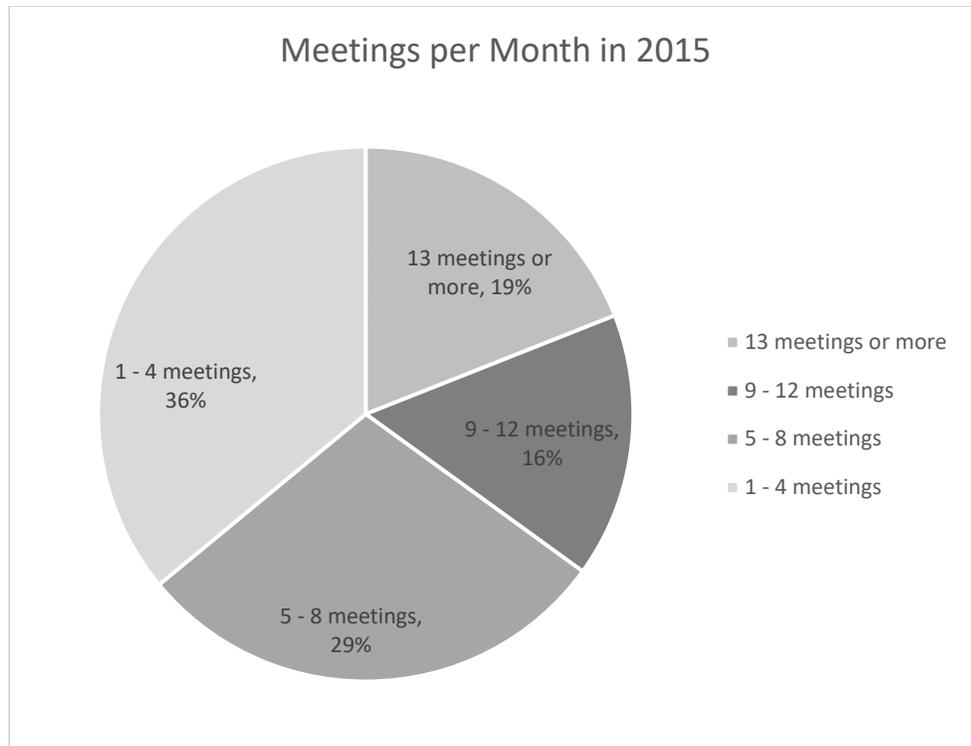
Before conducting interviews, dissertation Zoom usage and experiences were gauged by using an online survey sent to the doctoral faculty. The survey comprised questions to elicit ways in which the dissertation chairs used Zoom for academic coaching purposes, and relationship development with their doctoral students. Responses from 65 dissertation chairs provided information on how the chairs used Zoom with their doctoral students. The dissertation chairs identified several ways they used Zoom, such as building relationships with students, providing detailed feedback, coaching in research-related areas, and developing scholarly writing skills, as shown in Table 2.

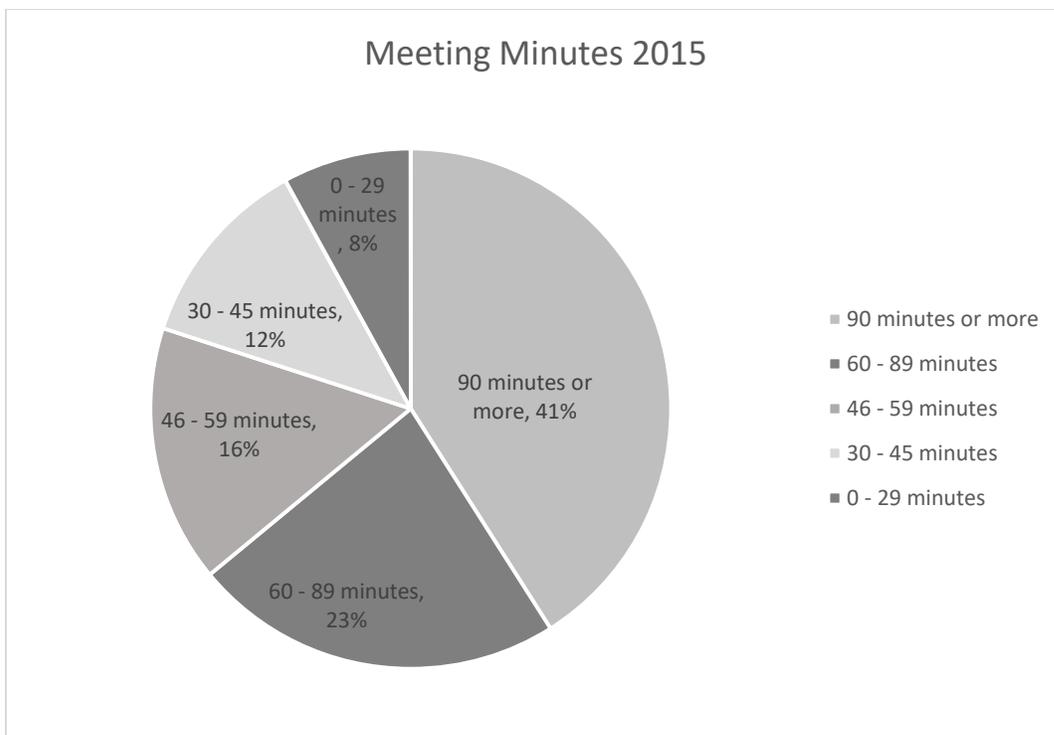
**Table 2. Zoom usage for relationship building and coaching**

	Never use	Will use in future	Use less than once a month	Use once a month	More than once a month
Build a successful relationship	3.08%	3.08%	4.62%	27.69%	61.53%
Provide feedback on deliverables	3.08%	4.62%	12.31%	36.92%	43.07%
Coach research skills	9.23%	10.77%	29.23%	21.54%	29.23%
Coach writing skills	18.46%	9.23%	30.77%	12.31%	29.23%

More than 90% of the dissertation chairs indicated they used Zoom for building relationships and providing feedback, 80% used Zoom for coaching research skills, and 72% used Zoom for developing scholarly writing skills. These data suggest that the dissertation chairs in this study were consistently using Zoom to provide coaching during the dissertation process.

The frequency and duration of Zoom usage varied, as illustrated in Figure 1 and Figure 2. Figure 1 highlights the number of Zoom meetings according to the data obtained in the survey. The self-reported survey data, showed that 19% of the dissertation chairs indicated they used Zoom 13 or more times per month, 16% used Zoom 9-12 times per month, 29% used Zoom 5-8 times per month, and 36% used Zoom one to four times per month. Dissertation chairs at the study university were encouraged to use Zoom a minimum of one time per month with each of their dissertation students. This data establishes that the majority of dissertation chairs in this study were meeting the minimum monthly video conferencing requirement.

**Figure 1. Chair Zoom video meetings per month (n=65)**



**Figure 2. Chair Zoom video meeting minutes per month (n=65)**

Figure 2 depicts the duration of Zoom meetings according to the survey data. The duration of the Zoom meetings varied significantly between dissertation chairs, as demonstrated in Figure 2. Forty-one percent of the dissertation chairs used Zoom 90 minutes or more each month, 23% used Zoom for 60-89 minutes per month, 16% used Zoom for 45 -59 minutes per month, 12% used Zoom for 30-45 minutes per month, and 8% did not use Zoom, or they used Zoom less than 29 minutes per month. The data show that, due to the lengthy meetings, the dissertation chairs were likely using Zoom for higher level academic coaching and mentoring purposes, rather than meeting briefly to answer lower level dissertation questions. This finding is consistent with the information extrapolated from the individual interviews of dissertation chairs and students.

### ***THEMATIC ANALYSIS RESULTS***

Thematic analysis of the interviews uncovered 23 themes. The thematic analysis focused on identifying all the themes that emerged from the data that had supporting codes from more than one participant. Since this research was exploratory with a small sample of interviews, the goal was to ascertain unique themes that could be further explored in future research. As displayed in Table 3, a group of 23 themes emerged from a set of 61 unique codes. It is interesting to note that 17 of the themes arose from both the dissertation chairs and the students, four themes were specific to the dissertation chairs, and two were specific to the students. These themes were used to answer the research questions which had led to these primary interview questions shown in Table 3.

**Table 3. Results of Thematic Analysis**

Focus of Primary Interview Questions	Themes	Chairs	Students
How Zoom is used by dissertation chairs with doctoral students during coaching	a. Guide the process b. Establish a virtual office c. Provide coaching d. Develop research skills	X X X X	X X
How use of Zoom during coaching establishes social presence	a. Like being in a cafe b. Establish a relationship c. See other as “human” d. Connect at deeper level to build trust	X X X X	X X X X
How use of Zoom during coaching builds research self-efficacy	a. Research together b. Learn methodology c. Improve scholarly writing d. Develop research toolkit e. Understand level of expertise	X X X X X	X X X X
How use of Zoom during coaching influences social isolation	a. Connection & engagement b. Know they care c. Prevents leaving program	X X	X X X
How use of Zoom during coaching influences motivation	a. Excitement about research b. Motivated internally c. Shares life stories	X X	X X X
Other areas of perceived value of Zoom technology	a. Variety of tools b. More natural c. Saves time	X X X	X X

### *COMPARISON OF THEMES ACROSS DISSERTATION CHAIRS AND DOCTORAL STUDENTS*

#### **How dissertation chairs use zoom with doctoral students**

In determining how dissertation chairs used Zoom with their students, the 23 original themes led to the development of four central themes (Table 3). The four central themes were: (a) guide the dissertation process, (b) provide academic coaching, (c) develop research skills, and (d) establish a virtual office. The dissertation chairs and the students described that the dissertation chairs used Zoom to provide coaching on the dissertation process and for the development of the skills needed for conducting research. Research skills included conducting a literature search, understanding the research design, and data analysis. Students identified the video meetings were used by dissertation chairs to: “Help build my toolbox,” “Interact with research online,” “Defend why I was doing the study I wanted to do,” and “Understand triangulation... and how to use it.” Similar comments from dissertation chairs included, “I can pull up G\* Power with a student ... and simply walk them through.” Themes that emerged unique to the dissertation chairs focused on the process of using Zoom to guide students through the multifaceted dissertation process. One dissertation chair described this transition process as:

They [students] begin to transition and show more skill; I think it is important to transition work over to them. Essentially, I make them the presenter ... for them to become a performer instead of keeping them in learning-mode all the time and tell them what to do. As

they go through the dissertation lifecycle, it is important that we, as coaches and dissertation chairs, help them make that transition to ownership.

Dissertation chairs also discussed that they used Zoom to set up a virtual office so students could virtually “knock” on their door to check availability for a short meeting, or to answer a question, as illustrated by this dissertation chair’s comment:

Here’s my Zoom meeting number, and if at any point during the day you have a question, just log in to Zoom for meeting with me, and it’s like having an open-door policy at school, or office hours. ... So, if you keep the door open, once they peek their head in, they’ll peek in more often.

### **How use of Zoom influences social presence**

Assessing how Zoom helped establish social presence, 12 codes led to four specific themes, which were common among dissertation chairs and students. The themes included: (a) using Zoom was like being in a café together, (b) Zoom helped establish relationships, (c) Zoom allowed us to see each other as “human,” and (d) Zoom promoted connecting at a deeper level to build trust. When discussing how Zoom helped build relationships between dissertation chairs and students, one unexpected finding was that the nature of the technology created the feeling of being in a café together. According to one student, when communicating with her dissertation chair, “Interaction with me is just like sitting across the table with her at Starbucks. Nothing’s different; it’s not like there’s a computer between us.” Another chair also referenced a similar perspective saying, “If I need to know what they (students) are doing I can turn the share screen over to them ... so it’s almost like sitting at a café together ... go get your cup of coffee; I got mine. Now let’s spread the papers out and deal with what’s in front of us.”

The process of interacting through the face-to-face meetings allowed dissertation chairs and students to establish a professional, yet familiar, working relationship. One dissertation chair described the relationship is better than the classroom saying, “I just like the fact that we can have a conversation and it’s really a matter of building trust and that’s what Zoom does that I haven’t found that I can do in classroom as well.” One explanation of how using Zoom helped enable this type of relationship proposed by a student was:

There are times when both of us are on and a dog will bark, or his daughter will call, or I will hear something happen in the background that will make him more human and relatable. As simple as that is. It makes it much more down to earth, as if you’re talking to your mentor. I like that. I know it sounds silly. But, I like that.

The dissertation chairs and students identified that a contributing factor to their relationship was that the face-to-face meetings allowed them to see the other as “human.” Dissertation chairs and students each provided examples demonstrating a feeling of humanness. One participant said, “We have a 30-second conversation about dogs, how we both like dogs...you build bonds that you don’t build when you’re talking about variables; you can’t do it without a video interface.” This finding contrasts with guidelines in the business environment suggesting that when using video conferencing, focus should be on professionalism and quality of presentation, and that content is more important than establishing a relationship. Results of the current study demonstrate that the informal aspects of the Zoom meetings led to creating a meaningful professional coaching connection. Zoom enabled dissertation chairs and students to see each other as human, which allowed trust and relationships to develop.

### **How use of Zoom builds research self-efficacy**

In gauging how Zoom helps build research self-efficacy in doctoral students, five themes emerged from 12 codes. The themes that emerged were: (a) the ability to do research together, (b) learn methodology, (c) improve scholarly writing, (d) develop a research toolkit, and (e) understand the level of student expertise. One way Zoom enabled research skill development was that during a Zoom meet-

ing, the dissertation chair could take the student on a “virtual field trip” to learn how to conduct scholarly research. Using the screen share function allowed the dissertation chair to demonstrate how to use the university’s library, or tools such as Google Scholar, SPSS, and Laerd Statistics. One dissertation chair provided this example of how he used a website for statistical analysis instruction:

I shared the screen and pulled up Laerd.com (a statistics website) and I took her through a tutorial, and I showed her what to click on to get to how to do it. And, you know there are 17 steps, where you click. It shows you exactly what to click on. The very next day she incorporated the 2x3 factorial ANOVA into Chapter 4, and sent it back to me and said, “Hey, how does this look?” And it was almost perfect.

According to one student, “Zoom provides you real-time interactions with the chair which just makes understanding and doing research that much easier.” Zoom meetings also facilitated development of scholarly writing, which is necessary at the doctoral level. Zoom allows dissertation chairs and students to work on the dissertation documents with annotation by both individuals, achieving a deeper understanding of the dissertation requirements. According to one dissertation chair, “I share the desktop one-on-one, and pull up the document as if I was sitting right next to them and say to them, ‘This is where you made a mistake, and this is what I meant when I said change the hypothesis so that it’s directional. I can highlight the word where it says the opposite of what I’m looking for, ‘This is what has to change.’ That usually spawns a discussion that gets us a little deeper into why I was looking for that. Without Zoom, we just don’t get that.” In addition, the dissertation chairs identified that the process of working one-on-one with their students enabled them to assess each student’s level of expertise in these research areas.

### **How use of Zoom reduces social isolation**

In relation to how Zoom influences social isolation, three themes emerged from the codes, two of which were common among dissertation chairs and students. The three themes were: (a) enabling connection and engagement, (b) knowing the dissertation chair cares, (c) and relationships that led to students remaining in the doctoral program. Dissertation chairs and students discussed how the virtual meetings helped establish connections. As one student said:

That’s what Zoom does. It makes me feel like I’m not alone; before we started doing Zoom, I felt that way. I felt as though I was just a student making a payment, and nobody really cared, and that all I did was just show up and do a few things, and that was it. And there was really no accountability. But now that we have Zoom, I feel more connected. I’m encouraged to do more. I’m encouraged to finish. I’m encouraged to pay more close attention to what I’m doing, and I’m excited, too.

Part of the connection came from collaboration. One dissertation chair identified that, “Zoom enables collaborative communication that helps them understand that they’re not alone, and that we are here for them, to help them through the process.” As one student said about her dissertation chair, “She’s caring. You just don’t feel like another student with her, you feel like she’s actually invested.” Only the students discussed the impact of this relationship on their retention. Connection was one of the areas that students and faculty discussed repeatedly.

### **How use of Zoom influences intrinsic motivation**

Regarding how Zoom influences motivation, 12 codes led to the identification of three themes, with two themes common to dissertation chairs and students. The three themes were (a) excitement about research, (b) motivated internally, and (c) share life stories. The dissertation chairs and students acknowledged different ways that the video meetings led to increasing excitement about research. In addition, students identified they were motivated to continue researching after they graduate. According to one student, “There are so many things I want to do, and there are so many things that I want to study. I think that, as difficult as the process has been, it definitely makes me want to do more re-

search; I can't believe I am saying that right now." Intrinsic motivation emerged as a theme that dissertation chairs and students recognized. Dissertation chairs and students agreed that video meetings motivated students intrinsically through the opportunity to engage. An unexpected finding was that half of the students recognized that because of the relationship with their dissertation chairs developed in these Zoom meetings, when they became overwhelmed with the dissertation process and considered leaving the doctoral program, it was their unique relationship with their dissertation chair that prevented them from leaving, and motivated them to continue their doctoral program.

### **Value of Zoom technology**

The interviews also provided an understanding of other reasons Zoom is valuable. Three themes emerged from 13 codes, and again two of the themes were common to dissertation chairs and students. The three themes were (a) variety of tools, (b) more natural, and (c) saves time. Dissertation chairs and students acknowledged that Zoom technology was natural, and that is it was like meeting "in real life." Dissertation chairs and students also identified a number of ways that Zoom saved time. One student said, "It saves time because 10-15 minutes' worth of time in a Zoom meeting can make up the difference of an hour when you are trying to decide, as a student, what the chair really meant by that little note on the paper you will get back two weeks later." According to another student, "It saved time and misdirection; not sending a thousand emails and able to share and communicate. We've been able to save a significant amount of time, and not burn me out going down the wrong trail." The dissertation chairs specifically identified the tools provided by Zoom, and discussed how they used the tools. Some of the technical capabilities they acknowledged were high-quality video, a shared whiteboard feature, ability to work on a document simultaneously, recording capability, the option to meet using their computer for a worldwide connection, and it serves as a virtual office. One of the unexpected benefits dissertation chairs and students identified was being able to read facial expressions and observe body language. That feature facilitated the dissertation chair's understanding of the student's situation and emotions. As one dissertation chair suggested, "To see from a physical sense ... I'm hitting the mark, or I can see that she understands what I'm trying to relate to her in terms of how she comprehends theory or a skillset that applies ..." Another dissertation chair stated, "It is visual; watching for the emotions is probably the most impactful for me."

## **DISCUSSION**

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### ***VALUE OF ZOOM***

The purpose of this exploratory single case study was to identify the perceived value of the use of Zoom, a new generation global cloud-based video technology, for dissertation chairs to coach and mentor doctoral students. Duration and frequency of Zoom usage was determined using self-reported dissertation chair data and university archival video records. The degree of usage and the approaches to using Zoom by dissertation chairs were collected using a survey completed by 65 dissertation chairs and by interviewing four dissertation chairs and four dissertation students. In terms of frequency of use of Zoom meetings with their students, 19% of the dissertation chairs indicated they used Zoom 13 or more times per month, 16 % used Zoom 9-12 times per month, 29 % used Zoom 5-8 times per month, and 36% used Zoom one to four times per month. The length of the Zoom meetings varied significantly between dissertation chairs. Forty-one percent of the dissertation chairs used Zoom 90 minutes or more each month, 23% used Zoom for 60-89 minutes per month, 16% used Zoom for 45 -59 minutes per month, 12% used Zoom for 30-45 minutes per month, and 8% did not use Zoom, or they used Zoom less than 29 minutes per month. The data demonstrates that the dissertation chairs were generally meeting the university requirement of using Zoom to meet with each of their doctoral students at least once a month for dissertation coaching.

The value of Zoom from the perspective of the dissertation chairs and students emerged from the thematic analysis of the video interviews with four dissertation chairs and four students comprising the interview sample. The thematic analysis, using a combination of inductive and deductive coding,

identified the value of Zoom for the dissertation chairs and students, and identified that Zoom contributed to the development of social presence, improved research self-efficacy, increased motivation, and reduced isolation. Interestingly, there were significant similarities between the perceived value of Zoom among the dissertation chairs and students.

A review of the themes that emerged from the interviews identified that from the dissertation chair and student perspectives, using Zoom for meetings influenced the four psychological areas in several ways. First, students and dissertation chairs identified that using Zoom helped them establish a significant and meaningful academic relationship, which increased their social presence. This theme coincides with the findings of Jones (2013), in his review of 995 articles on doctoral studies. In his thematic analysis, resulting in six themes, Jones found that student and supervisor relationships were essential for completing a doctoral degree in a timely manner. During the interviews in the current study, relationship building was the area that dissertation chairs and doctoral students spent the most time discussing. Dissertation chairs and students had strong feelings about the importance of building relationships during the dissertation process.

Second, dissertation chairs and students acknowledged that their relationship developed through Zoom contributed to feelings of belonging to the doctoral community and the university. The students directly stated that video communication led to a relationship with their dissertation chairs that reduced their sense of isolation. This finding aligns with prior research that indicates that fostering relationships between individuals who are geographically dispersed can be enhanced using video, which may reduce feelings of isolation (Bennett & Folley, 2014; Moore & Kearsley, 2012). The virtual environment facilitated a feeling of being present on the college campus, including the ability to ‘electronically knock at the dissertation chair’s virtual door.’ The students and dissertation chairs described that using Zoom felt natural and promoted a feeling of belonging.

Third, the dissertation chairs and students identified that using Zoom to develop a research toolkit, and working on dissertation documents, increased research self-efficacy. The focus of the research skills that were discussed during the interviews was on using research resources rather than developing skills. Possibly, this resource focus was because the doctoral students who were interviewed were at the beginning of the dissertation stage, drafting their proposals (Chapters 1-3 of their dissertation). This finding aligns with the findings by Orellana et al. (2016), suggesting that many of the doctoral supervisors they interviewed did not view their roles as trainers of research but, rather, instructors of research topics.

Fourth, the dissertation chairs and students identified that using Zoom positively influenced motivation. It is well established that intrinsic motivation is essential for doctoral program completion (Lovitts, 2005; Martinsuo & Turkulainen, 2011; Spaulding & Rockinson-Szapkiw, 2012). The doctoral students in the current study indicated that Zoom meetings were motivational because engaging with their dissertation chairs contributed to a desire to conduct research and continue in their program of study. Zoom meetings also helped the dissertation chairs set expectations and increase student accountability, ultimately increasing motivation.

In part, the value of video coaching meetings and the influence on the psychological factors can be attributed to the fact that Zoom offers high quality HD video and audio, and provides a unique set of features and applications. The Zoom features and quality provided functionality that enhanced the video meeting environment, creating a “café-like” environment. Zoom contributed to establishing a virtual scholarly environment allowing students to electronically knock at their dissertation chair’s virtual office door for an impromptu meeting. Zoom afforded the opportunity for sharing screens, joint annotations, and several applications used for coaching scholarly writing, research strategies, and data analysis. Collaboration on documents and applications was further supported through joint annotations by both participants. These findings were consistent with the previous extant literature on video technology, which highlighted that video conferencing provided an opportunity for engagement (Akarasriworn & Ku, 2013; Borup et al., 2012; Foronda & Lippincott, 2014; Yob & Crawford,

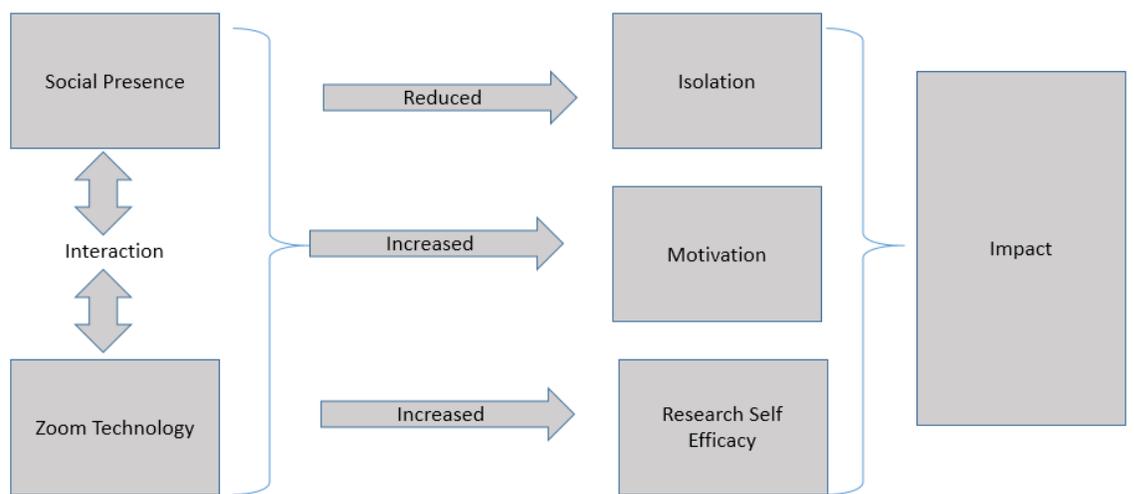
2012). In addition, dissertation chairs and their doctoral students identified that Zoom technology reduced time spent on specific tasks and generally enhanced the dissertation process. Doctoral students and dissertation chairs recognized the value of the various tools offered within the Zoom application.

***SURPRISING FINDINGS ON NATURE OF THE VIDEO TECHNOLOGY***

There were unexpected findings that emerged from this research. First, although there were no interview questions on retention as part of the interview, half of the students indicated that the nature of the relationships developed with their dissertation chair using Zoom contributed to their decision to remain in the program when they were considering leaving the program. This finding corresponds to previous research demonstrating that social integration propels doctoral students to persist (Gardner, 2010; Tinto, 1993; Zahl, 2015). Second, students identified that using video conferencing felt similar to having a meeting in a café. Consistent with prior studies interviewing students on video communication (Borup et al., 2012; Foronda & Lippincott; 2014), this finding revealed that video was like a face-to-face environment. Third, students recognized that the video meetings enabled them to think of their dissertation chairs as “human.” Fourth, faculty acknowledged numerous ways in which they were using Zoom with their students. One dissertation chair invited former graduates to participate in Zoom meetings to discuss their experience, providing motivation for current students. Other dissertation chairs took their students on “virtual field trips,” as they shared their computer screen and visited the online library, Google Scholar, or Laerd Statistics. Fifth, emotion and excitement displayed by the students and dissertation chairs during the interviews went beyond describing the mere benefits of video technology. Students and dissertation chairs agreed that using Zoom promoted discussions that facilitated a scholarly environment and established a collaborative research setting.

***CASE STUDY SUMMARY: A VISUAL MODEL OF THE PHENOMENON***

Summarizing the information in this case study is clarified with a visual model as shown in Figure 3. The results from this study supported prior research on the importance of psychological factors such as social presence (Gunawardena & Zittle, 1997; Short et al., 1976), research self-efficacy (Coryell & Murray, 2014; Wei et al., 2015), isolation (Golde & Dore, 2001; Hawlery, 2003; Lovitts, 2001), and intrinsic motivation (Deci & Ryan, 2000; Gardner, 2010) to improve doctoral student success. The findings of the current study indicated that social presence enabled research self-efficacy, reduced isolation, and contributed to intrinsic motivation. Figure 3 depicts a model showing the psychological factors examined in this study. The model illustrates the relationships that emerged from the data.



**Figure 3. How an advanced video technology influences doctoral students from a psychological perspective**

The model in Figure 3 illustrates the relationship between the various psychological models that provided the theoretical foundation for this research. Several theories and models informed this research such as social presence theory (Short et al., 1976), research self-efficacy theory (Bandura, 1986), student retention model (Bean, 1980), and connectivism theory (Downes, 2005; Siemens, 2005). In the interviews in the current study, the dissertation chairs and students focused predominantly on the development of a meaningful relationship between them, which resulted from the use of Zoom technology and the increase in social presence. The combination of these two factors influenced the other psychological factors, including a reduction in social isolation, an increase in motivation, and an increase in research self-efficacy. These factors appear to impact results in different ways, including retention.

When looking at the themes that developed within each of these areas to answer the related research questions, the complexity of this phenomenon emerged. Within each of the boxes depicting these factors or variables, various themes emerged that answered the research questions relevant to these theoretical perspectives. The first two boxes identify the interaction of the dissertation chairs and students with the technology and the resulting increase in social presence that led to the development of a meaningful working relationship and continued use of the technology. This coincides with Borup et al. (2012) who found that emerging video technology could improve virtual relationships between teachers and students because video enabled them to seem more present. Further, their study showed that video communication impacted social presence and was similar to a face-to-face meeting (Borup et al., 2012; Sivunen & Nordbäck, 2015). Examining the themes in the model shows the interactivity between the various theories or models. In terms of the Zoom technology, both dissertation chairs and students identified the technology created a virtual environment not only for the video meeting but also in terms of dissertation chairs having virtual office hours where the student could electronically knock on their door and have a meeting. This environment was more natural partially due to the high-quality HD video. This more natural environment led to interactions where they saw each other as more human. As chairs and students worked together in what seemed like a café environment, they used a variety of tools such as working on a shared document. The combination of the working interactions using various tools and the nature of the technology led to creating a deeper level of relationship and further increased social presence. In addition, both dissertation chairs and students benefited from time savings throughout their interactions.

The interaction of these two factors, Zoom technology capabilities and social presence, influenced various psychological factors in many different ways. The feeling of social isolation was reduced as the human interaction using this high-quality technology demonstrated to the students that someone cared. Since doctoral students commonly feel isolated during the dissertation stage (Ali & Kohun, 2007; Gardner, 2010; Rovai, 2002), capitalizing on innovative technology to meet the unique need of these students, creates more opportunities for success. Findings of the current study showed that, over time, connection continued to develop between students and dissertation chairs as they continued to engage in the process together. Motivation increased because of some of the stories dissertation chairs shared about their own dissertation experiences, further demonstrating that dissertation chairs were also human. Due to the challenging nature of the doctoral program, intrinsic motivation is essential for completing a doctoral degree (Lovitts, 2005; Spaulding & Rockinson-Szapkiw, 2012); as such, approaches that encourage doctoral students to invest and persevere are vital. In the current study, as dissertation chairs shared their stories and worked together with the student on the research and documents, the student became more motivated and excited not only about their own research but also about doing research after they graduated. Through the process of using the tools such as the whiteboard and working on various aspects of research from scholarly writing to data analysis, students improved their understanding of methodology and began to develop their own research toolkit.

No research questions looked for impact on results. However, throughout the analysis, data emerged that indicated some of the areas where results appear to have been impacted. Some students

indicated that the relationship established through this process led to their not dropping out of the program. Others indicated there was significant time saving to students and dissertation chairs. These time savings may also reduce the dissertation cycle time. Another area that may provide additional results would be increased student satisfaction. The various areas of impact need to be further identified and ultimately measured through quantitative research. The value of this approach may go beyond psychological factors to financial results, cycle time, and customer satisfaction.

Although it would be easy to leave this model at this high level, showing the relationships between the theoretical perspectives, that analysis would not comprehensively describe this phenomenon. Rather, the above discussion of one possible description of this phenomenon illustrates the complexity of the interaction of Zoom video technology and these various psychological factors. More work is needed to be able to understand and leverage the impact of this interaction between technology and human psychological factors including social presence, social isolation, intrinsic motivation, and research self-efficacy. In addition, further work is needed to better understand how this phenomenon may influence actual measurable results such as a dissertation cycle time reduction, cost reduction, increased satisfaction, and increased retention.

### ***STRENGTHS AND LIMITATIONS***

There were several strengths associated with this study. First, several sources of data were used such as self-reported video usage, archival video usage, interviews of dissertation chairs and students, survey data, and review of documents and artifacts related to Zoom. Second, archival data on Zoom usage by dissertation chairs enabled the research team to select dissertation chairs with high levels of Zoom usage for interviewing purposes. Third, a series of interviews consisting of four dissertation chairs and four of their students provided a comparison of dissertation chair and student perspectives based on their shared experiences. Fourth, the research team comprised three different stakeholder groups including a member of the universities' leadership team, an experienced dissertation chair, and a doctoral student who was researching a related topic.

There were also several limitations in this study. The survey was not sent to doctoral students, which would have added more information on their Zoom usage and experiences. Also, the interviews were limited to four dissertation chairs and four students. Although this is an acceptable number of interviews for a single case study, more interviews would have provided a richer data set. In addition, this case study was limited to a doctoral program at one private university in the southwestern United States. The study was also limited by the study of the single video conferencing application, Zoom. Finally, demographics on ethnicity, age, income, and family status were not collected.

### ***RECOMMENDATIONS FOR FUTURE RESEARCH***

The results and limitations of this study, as well as the visual model describing the study findings (Figure 3), provide several future research opportunities. Although the current study indicated that using a virtual meeting technology influenced various psychological factors including social presence, research self-efficacy, social isolation, and intrinsic motivation, there is a need to further define specific practices that dissertation chairs and students use to positively impact psychological factors. Interview comments from students and dissertation chairs in this study helped frame potential relationships. However, there were insufficient data to identify all the possible linkages between social presence, research self-efficacy, isolation, and motivation. Using quantitative data, future researchers could explore further potential linkages between the psychological factors, video conferencing technology, and relationships developed during the dissertation stage. Identifying the nature of these relationships and the effect on faculty and students may facilitate the success of doctoral students by developing a deeper understanding of how psychological factors are influenced using emerging cloud-based video technology and its specific type of uses within a doctoral program during the dissertation phase. Additionally, conducting a similar study in other colleges or universities could refine the themes uncovered in this study, and identify other possible factors that occur when faculty and

students use video technology to meet virtually. More research is recommended to explore the linkages between various psychological factors, Zoom usage, student and dissertation chair relationships presented in this study, and doctoral student retention

Future researchers could further test and refine the proposed visual model. Ongoing research could focus on adding another category to Figure 3 that delineates the measurable impact of video meetings between doctoral students and their dissertation chairs. Quantitatively exploring reduced dissertation time, increased student and faculty satisfaction, and improved graduation rates could provide valuable information on how video is used to improve the dissertation experience. The nature of video technology and resulting applications has changed dramatically in recent years. Burgeoning online doctoral programs (Gardner & Gopaul, 2012; Gooch & Watts, 2014; Moore & Kearsley, 2012) provide opportunities to use video technology to facilitate progress during the challenging dissertation stage. Future researchers could explore the nature of the doctoral program changes, and how technological advancements in video technology provide areas for improvement in the effectiveness of the dissertation process.

## CONCLUSION

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As doctoral programs continue to grow, supporting more online nontraditional students, colleges face the ongoing challenge of high attrition as well as the need to improve research capabilities of doctoral students. Various psychological factors including social presence (Gunawardena & Zittle, 1997; Short et al., 1976), research self-efficacy (Coryell & Murray, 2014; Wei et al., 2015), isolation (Golde & Dore, 2001; Hawlery, 2003; Lovitts, 2001), and intrinsic motivation (Deci & Ryan, 2000; Gardner & Gopaul, 2012), influence retention of doctoral students. The purpose of this article was to share the experience of one university that implemented an emerging global cloud-based video technology for dissertation chairs to coach and mentor online doctoral students during their dissertation. The focus of the research was to understand how dissertation chairs and their students used Zoom video technology for academic coaching, and how that influenced the students from the psychological perspectives of social presence, research self-efficacy, social isolation, and intrinsic motivation.

The study used a single-case approach with a target population of over 300 dissertation chairs supporting approximately 1,800 students in the dissertation phase. Data collection included a survey completed by 65 dissertation chairs, interviews of chairs and their students, the university database, and related documents and artifacts. The university maintained a database on the usage of Zoom by dissertation chairs, which led to the identification of four dissertation chairs with high levels of Zoom usage. The four dissertation chairs recommended students who might be interested in participating in the study. The research team interviewed four dissertation chairs and four doctoral students. The information obtained from the survey and interviews offered compelling evidence that dissertation chairs and students had similar perspectives on the value of the emerging global cloud-based video technology. Zoom usage enhanced social presence, enabling dissertation students and their dissertation chairs to build valuable academic relationships, which enabled the students to feel they were part of the doctoral and college community. The academic relationships also increased research self-efficiency in the students, which is essential during the dissertation process. According to Bandura (1986), higher levels of self-efficiency can predict task confidence. The dissertation process is challenging (Bennett & Folley, 2014; Jones, 2013; Martinsuo & Turkulainen, 2011), and virtual meetings provide a method to develop research skills in online nontraditional doctoral students. The video technology also improved the student and dissertation chairs' relationships because the doctoral students were able to see their dissertation chairs as human, motivating students to progress in their research. Building an academic relationship with their dissertation chairs helped reduce feelings of isolation in the doctoral students, which may lead to retention.

There were several unexpected findings not only on how Zoom was used for the dissertation coaching process, but also on how its use contributed to student retention. Two students identified that the relationships developed with their dissertation chairs via Zoom led to them remaining in the program when the dissertation became challenging. Dissertation chairs used many Zoom applications including the virtual whiteboard, shared applications and screen sharing, joint annotation, cell phones to conduct meetings, visiting various instructional websites during Zoom meetings, recoding meetings for future use, and establishing a virtual office. The most surprising finding was that use of this global video technology went beyond providing a video conferencing experience to establishing a virtual, human, scholarly environment in which dissertation chairs and students could work together to produce quality research. Online nontraditional doctoral students face unique challenges (Gardner & Gopaul, 2012; Offerman, 2011), and forming academic relationships can improve the development of scholarship in novice researchers (Akarasriworn & Ku, 2013; Baker et al., 2013). Finding of the current study indicated that dissertation challenges could be mitigated by using Zoom video technology in various ways to enhance dissertation chair and student relationships to influence the psychological factors in doctoral students that contribute to improved motivation, research capability, scholarly writing, and retention.

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## BIOGRAPHIES

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**June Maul** is SDA Supervisor for a team of 25 dissertation chairs and methodologists, College of Doctoral Studies, at Grand Canyon University coaching in areas such as leveraging new technologies. She chairs learners in the Psychology PhD program. Dr Maul's experience in the academic world began after 25 years in the telecommunications industry, having held senior leadership positions including corporate officer in a large telecommunications company, chairing the Board of Directors for a virtual company, jointly owned by Qwest and the CWA, and Division Manager for Corporate Telecommunications at AT&T. Dr Maul has been invited to present internationally as well as to author articles, books, and cases including for HBS Publishing. Research interests include virtu-

al organizations, innovative problem solving, leveraging emerging technologies, and ethical reasoning. E-mail: [june.maul@my.gcu.edu](mailto:june.maul@my.gcu.edu)



**Ronald Berman** is an Assistant Dean for the College of Doctoral Studies, and is responsible for overseeing the development and implementation of long-term strategies that enhance the effectiveness of Doctoral Education at Grand Canyon University. He is the primary architect of the Doctoral Community Network™ and the program chair for the Doctor in Business Administration Program. Dr. Berman has presented at numerous national and international conferences. His research interests include data analytics, virtual learning communities, research processes, and strategic directions and technologies to enhance retention of doctoral learners. He participates in doctoral dissertation committees and teaches innovation, leadership, technology, and analytics. E-mail:

[ronald.berman@gcu.edu](mailto:ronald.berman@gcu.edu)



**Cathrine Ames** is the Institutional Review Board Research Specialist at Grand Canyon University, College of Doctoral Studies in Phoenix, Arizona. Dr. Ames is also an Adjunct Faculty Member in the College of Doctoral Studies and a Dissertation Content Expert. Dr. Ames is the former cofounder and co-president of the Doctoral Community Cohort for doctoral students at Grand Canyon University. She was previously an elementary teacher and Vice Principal. Her research interests include doctoral retention, emerging technology, virtual teams, learning communities, blended learning, online environments, connectivity, effective communication, and leadership.