Teachers In The Cloud: Teachers’ Feelings Of Comfort Integrating
Google Suite For Education

by

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We accept this Thesis as conforming to the required standard.

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Abstract
Because Google Suite For Education (GSuite) has been adopted in public schools across Canada, it is a demand for educational stakeholders need to understand cloud computing technology as well as GSuite to fully take advantage of it. There have been many studies that have focused on the benefits and risks of using cloud-based technology in education. Among those studies, data privacy and online security were reported as a big concern regarding cloud-based technology. However, there is a paucity of research that exclusively explores the role of teachers and how they can maximize the use of GSuite in teaching and learning. This quantitative study used the Teacher Technology Integration Survey (TTIS) and a part of 2012 Global Cloud Computing survey to examine teacher’s general technology integration and teacher feelings of comfort using GSuite in particular. The instrument was delivered as an anonymous paper-based survey to minimize the risk regarding loss of online privacy. Of the 105 secondary teachers in Nanaimo Ladysmith School District, 23 teachers completed the survey. Pearson Product correlation was used in the study to find that teachers’ comfort using GSuite is significantly correlated to teachers’ general technology integration. Teachers with high levels of general technology integration felt more comfortable using GSuite in school. Furthermore, the data also revealed that teacher feelings of comfort using GSuite was not significantly correlated to the availability of technology in school or the frequency of technology use. Though teachers reported that they felt comfortable using GSuite, this did not mean they were concerned about data privacy and online security. The findings of this study will expand knowledge of GSuite use in school by educational practitioners. Understanding teachers’ perceptions about GSuite may also provide school leaders with ideas for training curriculum to optimize the implementation of other cloud-based technology by teachers in public school contexts.
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Chapter 1: Problem to be Investigated

Purpose of the Study

This study investigated the strength of the relationship between secondary public school teachers’ feelings of comfort using Google Suite for Education (GSuite) and their general technology integration in Nanaimo-Ladysmith Schools District (SD #68) British Columbia, Canada.

The appearance of computer-related technology has changed basic educational practices, which helps “students not only to create new knowledge but also to connect it to the world, using the power of digital tools to do things that add value in our knowledge-based, technology-driven societies” (Fullan et al., 2014, para. 6). Education is increasingly more reliant on technology and the Internet, and demands classroom use of this technology (Magnussen, 2008). In school management, the changes brought by technology are also significant. For example, cloud computing has become one of the essential technologies that facilitate communication between students, teachers, and administrators, and enhances the collaboration among teams and stakeholders.

Brand (1997) stated teachers must possess confidence, understanding, and skills that come from adequate training and development to effectively access technology tools in school setting. However, the mass integration of technologies into school settings still challenges some teachers because their computer-related education skills are inefficient for the technological tools (Wood, Mueller, Willoughby, Specht & Deyoung, 2005; Pickett, 2009; Sahin, Top & Delen, 2016). Teachers require adequate technology training and support in order to increase their use of technology in the classroom (Wood et al., 2005; Kingsley, 2007; Sahin et al., 2016). General expectations to use technology combined with insufficient preparation may lead to teachers
experiencing negative feelings of comfort related to technology use (Wood et al., 2005; Pickett, 2009). This situation is significant as it has the potential to affect and constrain the quality of the teaching and learning process in classrooms regarding using technology in general, and cloud computing services specifically (Wood et al., 2005; Ng & Ho, 2012; Gonzalez-Martínez, Bote-Lorenzo & Cano-Parra, 2015; Lim, Gronlund & Andersson, 2015).

The purpose of this present study was to identify and assess the strength of potential relationships between teachers’ feelings of comfort related to GSuite use, and their levels of general technology integration in the classroom through a quantitative study of teachers in secondary public schools in coastal British Columbia Canada.

Google Suite for Education (GSFE or GSuite) is the new name for Google Apps for Education (GAFE), which was launched by Google Inc. in 2006 to help students and teachers share and learn together (Rochelle, 2016). As of September 2014, GSuite had 25 million users (Google, n.d.). Microsoft offered a similar service in 2011 named Office 365 (Motal, 2011). These two services have been rapidly integrated into learning and teaching practices in public schools across North America (Motal, 2012; Google, n.d.).

Nanaimo-Ladysmith School District (SD68) is one of many school districts across British Columbia that provides GSuite accounts to kindergarten to grade 12 (K12) staff and students to enhance teaching and learning practices. The school district states that GSuite “allows students more flexibility in their working environment and provides greater access than traditional pen and paper assignments” (“Google Apps for Education,” 2016, p. 1). In addition, different grades have different access rights to GSuite. K-3 student have access to GSuite within their own classrooms, Grades 4-8 students have access to GSuite within their own classrooms and other participants within the schools, while Grades 9-12 students can access GSuite across the district
By identifying possible connections between teachers’ feelings of comfort with GSuite, and levels of teachers’ general technology integration, this study contributes to the wider body of research around effective implementation of technology in classrooms.

**Justification of the Study**

The strong integration of information technology in education requires school teachers to face a unique complex challenge (Wood et al., 2009). In a study about the barriers and obstacles that the teachers reported related to technology integration, Pierson (2001) found teachers must invest a lot of their teaching time and ability to integrate technology effectively in the classroom while balancing of other traditional teaching approaches. Gacoin (2018) reported that

Information and Communications Technology (ICT)-enabled learning environments required by the newly redesigned curriculum in British Columbia (BC) K-12, Canada, led to a dramatic change of teaching and learning. Gacoin (2018) reviewed the project *We The Educators* of the Alberta Teachers’ Association, and compared it to existing British Columbia Teachers’ Federation (BCTF) research in order to expand discussion how technology education could enrich the fundamental goals of public education. He indicated that BCTF policy let teachers “use their professional judgement to decide when, and whether, to use technologies as tools for enhancing teaching and learning” (Gacoin, 2018, p.4). As teachers in BC were reported to be actively negotiating the role of education technology in their daily practices and decisions, Gacoin (2018) suggested more conversations and studies needed to be done to address the needs of teachers.
In the Vietnamese context, Peeraer and Van Petegem (2010) discussed the gap between the technological hyperbole in Vietnamese education policy and actual technology implementation (Peeraer & Van Petegem, 2015). Peeraer and Van Petegem (2011) found that teachers did not feel comfortable in integrating ICT to enhance the teaching and learning because they believed that ICT would take over teaching functions and erode the role of teachers in classrooms. The 2007 Asia Policy Forum on ICT integration in Education recommended that ICT integration should start with teacher education and training (Peeraer & Van Petegem, 2011). The case of Vietnamese policy is an example of an ineffective approach. First, the Master Plan 2010 was not implemented practically. Tran and Stoilescu (2016) argued that the vague details without evaluation plans confused the educational stakeholders. Additionally, they found that Vietnam Ministry of Education and Training could not distinguish the meaning of “learning ICT” and “learning the application of ICT” (Tran & Stoilescu, 2016). Also, rather than front-loading provision of technology and training, Vietnam’s National Plan for ICT in Education waited 9 years to supplement measuring methods, update new technology, and deploy teacher training (Tran & Stoilescu, 2016). Despite the years of efforts for integration of ICT in Vietnamese public education, there are still no reports of the government’s progress. Peeraer and Van Petegem (2011) also noted that teachers faced additional challenges in technology integration because the government policy did not provide specific guidelines for integration models and lacked examples of “how integration of ICT in teaching and learning should look or what teachers needed to know or believe” (p. 981). As a result, lack of clarity regarding the purpose of ICT integration policy confused educators at different levels. One Vietnamese educator commented:
I don’t think ICT can ever replace teaching staff. And it doesn’t sound like a good reason to use ICT. It can be used to promote distance education, where there might be less teaching staff, or where the teaching profession takes other forms. (Peeraer & Van Petegem, 2015, p. 52)

Like Vietnam, technology integration across North American public schools continues to be hampered due to the challenges of providing prompt training to teachers and their willingness to adopt and integrate technology into daily learning and teaching practices (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012). Even though school systems vary across the US and Canada, both nations’ public-school systems are integrating Chromebooks and GSuite in daily learning and teaching practices (Milton, 2015). Sahin et al. (2016) noted that teacher attitudes toward Chromebooks has changed from positive to negative over a school year due to technical issues related to devices, blocked websites, and inadequate training on the new technology. It is important to understand teachers’ feelings of comfort when using GSuite and their perceptions of obstacles to adoption when considering the level to which teachers integrate GSuite into their classroom practice. Moreover, the use of cloud computing technology in education faces many risks regarding data privacy, cloud-based resources, and teacher training (Gonzalez-Martínez et al., 2015; Lim et al., 2015)

GSuite is now commonly considered as a cost-free suite of cloud-applications containing software like Google Docs that addresses various needs of teachers and students in a seamless integrated system (Lindh & Nolin, 2016). There has been an increasing uptake in GSuite as neoliberal economies in education across the US and Canada focus schools’ attention on “free” tools (Milton, 2015; Hengstler, 2017). While there are referenced studies addressing education
technology integration in general, there is a paucity of research specifically addressing the integration of GSuite especially in regard to Canadian schools. Recent comments made by district administrators from around the province at the BC Educational Resource Acquisition Consortium workshop, “Due Diligence in the K-12 Education Context” (October 24, 2018; River Rock Casino, Vancouver, BC) indicate increasing pressure on BC public districts to adopt GSuite (J. Hengstler, personal communication, October 29, 2018). Moreover, the year 2018 has witnessed a strong concern of parents toward the rising use of GSuite in classrooms across Canada (Desson, 2018; Malkin, 2018; Bresnahan, 2018). As the controversy intensifies over privacy and security regarding GSuite, prompt and reliable research activities on the integration of GSuite as one of cloud computing services in education need to be done to generate more knowledge for educational stakeholders. The present research contributes findings from self-reported teacher surveys, representing perspectives of those who engage directly with GSuite in teaching and learning activities.

In summary, the literature and research findings support the need for integrating educational technology in the classroom and show that not all teachers feel comfortable using computer-based technology for classroom instruction and learning. Shattuck (2010) argued that teachers were the ones who adopt technology practices in classrooms. In the process of implementing technology in schools, teachers are critically positioned because teachers usually have “the initial experimentation and enthusiasm” (Collis & Moonen, 1993, p. 113). Because of the rapid pace of technological change and increasing pressure to integrate technology in school settings, teachers may feel overwhelmed due to a lack of training, support, and familiarity with technology in general and the specific technology to be implemented (Hughes, 2005; Wood et al., 2005; Pickett, 2009; Shahin et al., 2016). Even though cloud-computing is increasingly used
by school districts across Canada (Milton, 2015), the problem remains that teachers are not comfortable using computer-based technology, and the reasons for this are varied. Additionally, despite the mass commercial promotion from Google Inc. (Google, n.d.), research and study about the advantages and disadvantages of GSuite with Chromebook devices in public schools across the world is really limited. This current study should contribute new knowledge to increase the understanding of implementing GSuite in a K-12 setting.

**Research Question and Hypothesis**

The goal of the study was to examine how strong the teachers’ feelings of comfort with GSuite in school settings relates to their general level of technology integration. The following research question was proposed for the present study: What relationships exist between secondary public-school teachers’ feelings of comfort using GSuite and teachers’ technology integration in general in Nanaimo-Ladysmith public schools (SD #68) in British Columbia, Canada?

The principal investigator (PI) rejects the null hypothesis. The PI hypothesized:

- The research data would demonstrate that teachers reporting significantly higher levels of general technology integration would also report high feelings of comfort implementing GSuite;
- The research data would demonstrate that teachers reporting significantly lower levels of general technology integration would also report low feelings of comfort implementing GSuite.

**Definition of Terms**

The following definitions will be pertinent to the present study:
Education technology refers, as practice, to any form of improving teaching and learning that makes use of technology in regard to effectiveness and/or efficiency.

Cloud-computing is Internet-based computing in which shared resources, software, and information are provided to computers and other devices on demand.

Google’s G Suite for Education (GSuite) is an education cloud-computing service package of Google’s free web-based applications available for educators from Google Inc. that is specifically designed to be used in classrooms and schools at large.

Technology Integration is a process of comprehensively using technology to enhance and support the educational environment.

Teacher’s feelings of comfort refer to the feelings of freely practicing teaching activities without any fear of being disadvantaged by the lack of technology skills.

Brief Overview of Study

This quantitative research study is designed to expand knowledge regarding the relationship between secondary public-school teachers’ general technology integration levels and their feelings of comfort regarding Google Suite for Education (GSFE or GSuite) in Nanaimo-Ladysmith public schools (SD68) in British Columbia, Canada. This study examined teachers’ general levels of technology integration, examined teachers’ levels of comfort with using GSuite, and analyzed relationships using Pearson correlation coefficients between the subscales. The research explored whether there were bivariate or linear correlations. The significance of possible relationships was used to suggest areas for future research and improvement to practices regarding teachers’ feelings of comfort when confronting the integration of GSuite services in teaching and learning. This research might also have wider implications for integration of cloud computing services in education.
Chapter 2: Background and Review of Related Literature

This chapter review of literature includes information regarding teachers’ technology integration, cloud computing in education, and teachers’ feelings of comfort using GSuite. The information was acquired primarily from journal articles and Google websites which reported the use of GSuite. Journal articles were retrieved from Vancouver Island University Library Host database.

Many studies have already shown that technology integration became part of the role of teachers to develop students’ computer literacy (Pickett, 2009). As the result, proper skills of technology integration are required for existing and new teachers. Using cloud computing services like GSuite asks teachers to have more specific skills and knowledge in order to create the best teaching and learning environment in schools, which may put pressure on teachers and make them feel uncomfortable toward new technology. The success of equipping skills, knowledge, and feelings of comfort for teachers is not only influenced by the teachers themselves, but also by additional stakeholders such as administrators and information technologists (IT) (Sultan, 2013; Gonzalez-Martinez et al., 2015).

This literature review begins with studies related to teachers’ technology integration and assesses tools which suggested the status of teachers in using technology in school settings. It then moves onto a review of cloud computing technology including benefits and risks of use in educational environments. Next, some studies are discussed regarding the feelings of comfort using GSuite in schools. These studies will explain how GSuite was used to improve collaborative learning and managerial tasks in schools. Cloud computing is familiar relatively recent phenomenon in education rising up within the last 10 years (Gonzalez-Martínez et al., 2015). This literature will give the reader background and information about cloud computing
integration issues. This literature informed the research design of the present study and the subsequent discussion of the findings.

**Teachers’ Technology Integration**

At the beginning of the 20th century, the popular use of visual aids such as films, pictures, and lantern slides in public school marked the meaningful integration of technology in classrooms (Reiser, 2001). The use of computers in learning and teaching practices entered widespread use in the mid-1990s. Reiser (2001) reported computers in the United States were being used to explore programs and basic word processing skills with an average ratio of one computer to nine students. By 1995, the access to the internet changed the use of computers in teaching and learning as computers could deliver more content and media to students. Furthermore, the use of other computer-based tools like email, chat rooms, and interactive whiteboards helped learners interact with the content, instructors, and other learners (Reiser, 2001). The 2000s marked an increase in using computers and internet access in classrooms. Web 2.0 tools such as wikis (a server program that allows users to collaborate in forming the content of a Web site), blogs (personal diaries that people shared online), and podcasting (a way of distributing audio files via the Internet) became more commonly used accordingly (Gooding, 2008).

An example of an educational systems with a strong emphasis on educational technology is Singapore. Singapore’s first ICT Master Plan for Education was launched by the Ministry of Education (MOE) in 1997 (Chua, 2015). The effective implementation of technology for learning purposes in Singapore’s Master Plan closely reflects two key targeted changes of the educational technology environment. The first was the transformation of the learning experience, including learning resources that would reach and be used in schools, at home, and on personal
devices. The second was that learning content and teaching approaches would be digitally related to motivate interest and innovation among young learners (IDA, 2006). While focusing more on the learning experience of students both inside and outside the classrooms, Singapore’s approach contrasts with its Australian parallel, Digital Education Revolution (DEEWR) (2008) which planned to provide adequate access to a wide use of digital teaching and learning resources in schools together with a one-to-one student to computer ratio. DEEWR (2008) provided a framework for using technology as a tool in the educational process. In Canada, an effort of promoting the change of model in public school has emerged through a national organization, C21 Canada, beginning in 2011. It was a response to “the advent of knowledge and digital era” (Milton, 2015). In May 2015, C21 Canada released “The 21st Century Learning Framework” which was “founded upon a set of seven declaratory principles, endorsing freer access for students, more personalized learning, and support for educational leaders committed to digital learning initiatives” (Bennett, 2016, p.15). The targeted outcomes of those master plans created different national teacher training and formed different constraints on teachers’ feelings of comfort using technology in schools (IDA, 2006; DEEWR, 2008; Milton, 2015).

In their examination of ways distributed leadership supported Singapore’s education technology reform process in a government school, Ng and Ho (2012) specifically tried to find how leadership was distributed and the factors that enabled or constrained the distribution of leadership in a school which was undergoing education technology reform. Ng and Ho (2012) used a case study design to investigate the process of education technology reform in Greenville Elementary, Singapore. Their data was collected through observation and interviews with school leaders, and teachers (Ng & Ho, 2012). These two methods were used by Ng and Ho (2012) to explore different aspects of leadership: the role of leaders in ICT reform, the role of the teacher
in education technology reform, and the interaction between leaders and teachers during the
reform. Ng and Ho (2012) coded the data for themes and compared the data and coding with
leadership literature to identify patterns in the leadership distribution. The study revealed
insights about how leadership was distributed in a Singapore school during an ICT reform. Ng
and Ho’s (2012) study found that middle managers oversaw changes of technology integration in
learning and teaching practices (first-order changes). School leaders were involved in changes to
organizational structure and culture (second-order changes). Finally, teachers with technology
expertise were the ones who mainly impacted the first-order changes of the middle managers (Ng
and Ho, 2012). The study also found primary school leaders were not the only defined leaders in
the education technology reform at Greenville Elementary: The school exhibited different levels
of leaders with significant linkages (Ng & Ho, 2012).

In the case of Greenville Elementary, Ng & Ho (2012) found that the school’s comfort with
education technology reforms was increased through a mixture of conventional workshops, on-
the-job training, just-in-time “training,” and professional feedback that were led by two teacher
leaders, an education technology expertise teacher, and a head teacher in science. Moreover, in
order to support the practical leadership of teacher-leaders for the development of comfort
implementing education technology, the senior management needed to redesign the school’s
timetable (Ng & Ho, 2012). The two researchers found the leadership model practised by
Greenville Elementary not only brought advantages in education technology reforms but also
caused some challenges related to a lack of expertise, and the embedded institutional hierarchy.
Moreover, even though there were some significant linkages between school leaders and teacher-
leaders, an overall synergy among some of other distributed school leaders was still missing (Ng
& Ho, 2012), which might be explained by further research about teachers’ beliefs and
motivation in technology integration reform. Ng and Ho’s (2012) study suggested the important roles of expert teachers who mainly faced rapid technology change as well as the leaders creating the culture and habits of using technology in teaching and learning. This echoes a finding in study of Wood et al. (2005) that in the early stages of education technology reform, teachers initially needed more support, practice, and opportunities to gain more experience to survive with the technology rather than focusing on how technology impacted learners.

In their exploration of teachers’ experiences in the use of technology-based teaching and learning (TbTL) in the foundation phase (caters for children from five to nine years, or grades R-3 of schooling), Hannaway and Steyn (2017) recommended that the advantage of digital tools for teaching and learning could be considered comprehensively when the “Foundation Phase classrooms are equipped with the necessary technological infrastructure” (2017, p. 1756). The authors concluded that the policy framework should focus on the specific learning style of children in order to integrate technology into the foundation phase properly (Hannaway & Steyn, 2017). Moreover, Hannaway and Steyn (2017) found that the integration of technology in classrooms depended significantly on teachers’ personal skills and motivation, requiring teacher training and development of new digital skills and pedagogical competence. Finally, Hannaway and Steyn (2017) revealed that the lack of appropriate digital learning content led teachers to time-consuming tasks of generating digital-based lesson plans.

Aiming at exploring why some educators adopted the use of digital game-play (DGP) in the classroom, Stieler-Hunt and Jones (2015) conducted in-depth, 1-2 hour semi-structured interviews with 13 educators (eight female, five male) who used DGP in classrooms across Queensland, Australia. Stieler-Hunt and Jones’ (2015) study defined a process of becoming a “believer”, where educators developed a positive attitude toward using DGP in classrooms. The
process defined seven areas contributing to a positive attitude: Success with using DGP, accessing information and advocacy, personal experience with games, valuing DGP, positive attitudes towards technology, invitation to use games in the classroom, being different to non-believing colleagues, and implications for the rate of diffusion of the use of DGP in classrooms (Stieler-Hunt & Jones, 2015). The study recommended that the attitude of the teachers should be emphasized and developed as a professional competency prior to the practicalities of adoption.

The study of Stieler-Hunt and Jones (2015) provided significant findings on the importance of teacher attitude and enthusiasm for use of digital games in the classroom. While the findings could be applied to other technologies, the characteristic of the sample and scaling need to be considered with limitations. The findings of Stieler-Hunt and Jones (2015) were based on experiences of educators who already had some significant accomplishment in applying DGs in their classrooms. This leads to some concerns with the concept of becoming a believer. If the data could have been obtained from educators who had bad experiences or failed in using DGP in the classrooms, other findings and elements of educator confidence toward DGP would likely have surfaced.

Wood et al. (2005) suggested that teacher familiarity with computers could be predicted by teachers’ higher feelings of comfort, and greater comfort was related to greater integration in the classroom. The finding responded to prior research that one of the most critical features for technology integration is teachers’ levels of comfort with technology. In their study about the barriers and supports to using technology in classroom, Wood et al. (2005) examined teacher perceptions regarding computer implementation in Canadian elementary and secondary school classrooms. They also found that due to rapid technology change ongoing external professional support regarding material resources to integrate technologies effectively was important (Wood
et al., 2005). Wood et al. (2005) concluded that the integration of technology demanded changes in the role of teachers, which may place too many demands on teachers without a great deal of understanding and support. This conclusion was confirmed by Pickett in 2009 who explored comfort levels of teachers concerning technology integration in classrooms using survey and focus group methods.

**Cloud Computing in Education**

“Cloud computing” is a term used to indicate a kind of computing that is easily scalable and uses virtualized resources that can be shared among the users. In another words, instead of using physical hard drives on a local computer or a phone’s memory to store data, cloud computing stores data in massive data centers distributed around the world and throttles the data storage and traffic among those centers to maximize efficiency. It is “an emerging application platform and aims to share data, calculations and services among users” (Ercan, 2010, p. 939). In educational institutions, those services and resources can be used for different purposes like finance, management, and communication. Cloud computing allows educational institutions to reduce budget costs related to expensive hardware and software (Ercan, 2010). This section of the literature review focuses on ways cloud-based services enrich teaching and learning.

Thomas (2011) described cloud computing as a significant education technology which provides information technology services to teachers and students anytime and anywhere through internet access. In an attempt to provide more information and knowledge about cloud-computing in education, Gonzalez-Martínez et al. (2015) not only reviewed the advantages and limitations of cloud-computing in education but also described the research challenges in the field. Their meta-analysis selected 112 studies beginning in 2007 for review (Gonzalez-Martínez et al., 2015).
Regarding to the benefits of cloud-computing in education, Gonzalez-Martínez et al. (2015) identified are seven benefits of cloud-computing in education. First is the availability of online applications in cloud-computing technology attracted education by creating new teaching and learning scenarios for educators, students and IT staff. Among cloud application, Google Apps for Education, (rebranded as Google Suite for Education, or GSuite), and Microsoft 365 have figured largely in the literature because they provide traditionally used productivity applications like word processing, spreadsheets, and presentations which have long been incorporated into teaching and learning (Lim et al., 2015; Wang, 2017; Woodrich et al., 2017; Marlatt, 2019). These cloud applications enhanced collaborative and interactive activities inside and outside classroom environment. Second is the flexible creation of learning environments (Gonzalez-Martínez et al., 2015). Educational practitioners could combine cloud-based services like Google Suite for Education, Delicious (a social bookmarking web service for storing, sharing, and discovering web bookmarks), Flickr (an online photo management and sharing application in the world), YouTube (a video sharing service), Facebook (a popular free social networking website that allows users create profiles, post comments, share photographs, send messaged to keep in touch) and blogs to provide different learning experiences like e-learning, personal learning, group learning and blended learning. Thirdly, Gonzalez-Martínez et al. (2015) found that cloud-based technology provided strong support for mobile learning. The scalability of cloud computing technology addressed the limitations of mobile devices regarding limited storage, processing power and connectivity. Fourth, cloud-based services supported evaluation activities as well as computing-intensive learning and teaching activities (Gonzalez-Martínez et al., 2015). The fifth benefit emphasized the scalability of cloud computing to enabled learning environments with higher processing demands to address eLearning with large numbers of
students without depending on a physical computing infrastructure (Gonzalez-Martínez et al., 2015). Since this leads to cost savings on hardware, the cloud allowed many learning activities to be conducted on devices with lower requirements as long as learners had access to cloud services. Finally, as many cloud tools are offered for “free” or pay-per-use model, institutions can save cost in software fee (Gonzalez-Martínez et al., 2015). However, the “free” services often carry a hidden charge: “the forfeit of one’s personal information” (Hoofnagle & Wittington, 2014).

Gonzalez-Martínez et al. (2015) also identified additional themes in educational research on cloud computing such as a bias to focus on benefits versus risks. Two significant risks of cloud computing in education are security and privacy. Even though some studies argued that storing data virtual servers was more secure, a majority of studies described concerns regarding leaks of sensitive information mostly due to the lack of user awareness and the transparency of how the data was stored and protected by cloud-computing providers (Bristow et al., 2010; Gonzalez-Martínez et al., 2015; Lim et al., 2015). Gonzalez-Martínez et al. (2015) identified studies which recommended different strategies dependent on the particular purpose of cloud computing use. For example, some studies recommended choosing hybrid clouds to store different kind of data, or private clouds designed for individual purposes (Gonzalez-Martínez et al., 2015). To raise confidence and acknowledge potential security risks, institutions should actively research and review contracts including how data is stored and how it is protected when choosing any cloud computing services (Gonzalez-Martínez et al., 2015). Another risk identified by Gonzalez-Martínez et al. (2015) was called “vendor lock-in”. This risk related to data protection which may fail because of the proprietary technology of a particular provider that causes a “lack of interoperability among different cloud providers” (Gonzalez-Martínez et al.,
A suggested solution was to choose private clouds or use more than one cloud provider. However, this approach might require more management and resident technology experts. Ideally, cloud service providers should be open to working together and building interoperability among their different services (Gonzalez-Martínez et al., 2015). Yet another risk that was identified in the meta-analysis was how poor performance of cloud services impacts learning outcomes for in-class interactivity and collaboration when not fully functioning or when not functioning well (Gonzalez-Martínez et al., 2015). Gonzalez-Martínez et al. (2015) found that because cloud technology depended on connectivity, educational institutions must ensure all student can at least access their learning resources during classes; this implies increased investments in sufficient network stability and infrastructure.

A final risk identified by Gonzalez-Martínez et al. (2015) was the cloud pricing models and application licensing fees. Gonzalez-Martínez et al. (2015) did not review the risks of “free” cloud-based services, which were discussed more in law reviews (Robison, 2010; Hoofnagle & Wittington, 2014). Whether or not were the services unpaid or free, most of cloud-based services failed to qualify for the privacy protections provided for in the Stored Communications Act, a 20-year-old primary federal source of online privacy protections (Robison, 2010). Moreover, as long as many cloud computing providers got their customers’ consent to share personal data through terms of service agreements, the Act would not apply, and the data could be disclosed to a third party (Robison, 2010). The societal attitude toward online privacy has changed greatly among new internet users, who expected to receive more “free” cloud-based services to network and communicate with others by exchanging their personal information. The fast growth of cloud computing technology needs to be aligned with society consensus about online privacy protections (Robison, 2010).
Gonzalez-Martínez et al. (2015) summarized six issues from studies reviewed in their meta-analysis. The first issue identified was the need for further research on private versus public cloud infrastructures for educational institutions. While there were many studies regarding private clouds, Gonzalez-Martínez et al. (2015) stated there was a need for further research on public cloud which “support educational systems, especially those with a highly variable demand, utilized for a short period of time or with an experimental use” (p. 142). Another significant issue was the need to schedule and reserve computing resources for in-class cloud-based activities (Gonzalez-Martínez et al., 2015). Thirdly, automatic scalability was found to be important where there was a high demand for access and streaming for teaching and learning activities. The fourth issue was how cloud-computing learning environments could be leveraged by educational practitioners. Gonzalez-Martínez et al. (2015) suggested the need for further research focusing more advanced ways cloud-computing could be used in education. The two last issues identified in the 2015 meta-analysis by Gonzalez-Martínez was the need for more research into interoperability of educational clouds and architectures to support mobile learning.

**Teachers’ feelings of comfort using GSuite in school**

Google is a key player in the IT world (Morel, 2011). The company was founded in 1998 and best known for its ubiquitous search engine which allowed the company to grow exponentially thanks to online advertising. In 2014, Google earned revenues of 59 billion dollars from sales of advisements (Google Inc., 2015). This helped the company provide different free services to users including GSuite. Studying the business model of Google, Fuchs (2012, 2014) stated the company used humans as “instrument for economic accumulation” (2014, pp. 279-280). As a player in advertisement industry, Google, uses its powerful search engine to access free digital labor as “people through their everyday practices produce the commodity that creates
Google’s economic wealth” (Lindh & Nolin, 2016). As a result, Fuchs (2012) argued that Google is an “ultimate user-exploitation machine” (p. 44). When Google exploits users’ data for financial gain, individuals’ privacy is also affected. Besides the effort of addressing exploitation of user data and information transparency through policy, Lindh and Nolin (2016) suggested that Google’s documentation was designed to “disguise the business model and persuade the reader to understand Google as a free public service” (p. 650). In fact, many studies mentioned concerns about data privacy as critical considerations for educational stakeholders (Bristow et al., 2010; Lim et al., 2015; Gonzalez-Martínez et al., 2015).

GSuite is defined as a secure cloud-based storage and application services provided completely free to educational institutions (Google, n.d.). To sign-up for GSuite, schools just need their own domains. Moreover, institutions must qualify and be reviewed before getting approved for GSuite and complete a licensing agreement (“GSuite for Education Terms of Service”, n.d.). The application services are managed through the Google Admin Console. The console allows users with administrative privileges to manage user accounts, available services including GSuite, and devices. Access to services can be turned on and off through this console. The number of GSuite applications has changed over time. In 2015, Lindh et al. reported that there were 8 licensing applications governed by GSuite agreement (Google Classroom, Gmail, Google Drive, Google Calendar, Google Docs, Google Sheets, Google Presentation and Google Sites). At the time of data collection in this present study, there are 13 applications covered under the GSuite licensing terms (Google Drive, Google Docs and Google Spread Sheet were merged as Google Drive and Docs, adding Google Hangouts, Google Vault, Groups for Business, Hangouts Chat, Jamboard Service, Google Keep, Google Tasks). The Google Admin Console can also manage 49 more “Additional Google Services” that are not governed by the GSuite
agreement. Where it is determined that users’ personal information (as defined by the Office of
the Information and Privacy Commissioner for BC) is being shared or stored outside Canada,
each Additional Google Service should be separately reviewed for privacy terms and risks:
Public schools operating under FIPPA in BC should obtain student and/or parental/guardian
consent before turning on such additional services for users.

Schools can choose to store the data in the US or in Europe. Hengstler notes that regarding
GSuite data storage in the BC context:

Any personal information of British Columbia residents stored, transferred, or accessible
outside of Canada places the data outside the protection of the Canadian Charter of Rights
and Freedoms and makes that data subject to the laws of foreign jurisdictions. Because
foreign jurisdictions do not necessarily protect privacy in the same way as BC and Canada,
this requires informed voluntary consent. In best practice, that consent is obtained from the
parent/guardian and the student. (J. Hengstler, personal communication, April 21, 2019).

Moreover, data that is stored, transferred or accessible in the United States is subject to The
PATRIOT Act (Google, n.d.). Hengstler (personal communication, April 21, 2019) also notes,

In the case of data stored in the European Union, it is important to note that the new
General Data Protection Regulation (GDPR) with extensive protection for personal
information only applies to citizens of member states of the EU and would not afford
Canadians or Americans any privacy protections under GDPR unless they were also
citizens of an EU country.
These privacy considerations are important because GSuite’s server locations and cloud-based storage means that the stored items can be shared with others and can be accessed online anywhere at any time for free with an internet connection, web browser, or on any mobile devices (Bartolo, 2017). As a result, teachers and students can work collaboratively (Thomas, 2011). For example, when using Google Docs, students and teachers can view, work and edit the same document simultaneously in real time (Spaeth & Black, 2012). Teachers and students also can make comments while working on the documents. These learning and teaching practices with Google Docs enable the instructor and the entire class to become more involved in the learning process at the same time. However, it is highly likely that some personal information is exposed outside of Canada during these activities—though the amount and type will be dependent on how a school administers GSuite use (J. Hengstler, personal communication, April 21, 2019).

Google reports that GSuite is used by more than 60 million students, teachers, and administrators around the world (Mohr, 2015). Moreover, the same report also mentions that there are 10 million Google Classroom users, and 10 million US students and educators are using Chromebooks (Mohr, 2015). According to Futuresource Consulting (as cited in Bartolo, 2017), 50% of Chromebooks sales were to K-12 educational institutions in the US in the last quarter of 2015. Bennett (2016) indicated that Google has had more success than Microsoft providing education software in elementary and secondary schools across Canada. Roberston (2013) argued that the low-cost cloud-based solutions offered by Google help schools to save money on specific software installations on personal computers or technicians to install and maintain that
software. These considerations begin to explain the popularity of Google’s products in classrooms.

Yet, a review of the literature did not identify studies regarding teachers’ perceptions toward using GSuite. However, for some insight researchers can look to the work of Lim et al. (2015): they examined Swedish school principals’ perceptions of cloud computing at a management level. Lim et al. (2015) used the 2012 Global Cloud Computing (Techsoup Global) to collect data. The analysis included 342 responses (Lim et al., 2015). The findings suggested that principals of primary and high schools in Sweden believed the main benefit of cloud computing in education was its ability to allow the teaching and learning process to occur anywhere if the learning materials, data, and software can be shared and accessed via the Internet (Lim et al., 2015). The principals agreed that communication and collaboration skills were enhanced significantly via virtual laboratories, peer-to-peer learning, and independent learning through using cloud services (Lim et al., 2015). On the other hand, not many principals mentioned the benefits of cost reductions related to IT operations and device costs (Lim et al., 2015). This contrasts with the findings of Gonzalez-Martínez et al. (2015) meta-analysis findings.

Lim et al.’s (2015) study revealed not many Swedish principals perceived obstacles to cloud computing adoption in schools. Their biggest concerns were related to online security and privacy (Lim et al., 2015). The study indicated that a lack of shared views of beliefs among the school leaders and other stakeholders, especially government support, challenged the adoption of cloud computing in Swedish schools (Lim et al., 2015). More interestingly, the research highlighted the findings about the conflicts regarding cloud computing providers and privacy agreements which indicated “future development of cloud computing in Swedish schools is
likely to be hindered” (Lim et al., 2015, p. 97). The researchers found remarkable differences in beliefs between principals from private versus public schools, as well as in schools of different sizes (Lim et al., 2015). Overall, Lim et al.’s (2015) findings show that cloud computing services were highly welcomed by Swedish principals in spite of challenges. However, it should be noted that the studied did not gather data related to principals’ personal background and belief, which may have surfaced hidden description and findings. Though Lim et al.’s (2015) study focused on principals, it can be related to further discussion and research regarding teachers’ beliefs and perceptions cloud-computing. Teachers, perhaps more than principals, have direct involvement in applying technology to evolve teaching practices in classes, and are actually on the “front line of technology leadership” (Ferris & Roberts, 1993, p. 53).

Conclusion

Studies report perceived benefits from the integration of cloud technology in education. However, to ensure that technology integration can be used appropriately, it is crucial to provide ongoing quality professional development to the teachers (Hannaway & Steyn, 2017) which involves all the educational stakeholders (Ng & Ho, 2012). The knowledge gaps of previous studies were full training for teachers to understand technology integration. Many of the teachers who were ready to apply technology in school settings demonstrated self-directed and reported positive personal experiences in using education technology (Stieler-Hunt & Jones, 2015). Others, in contrast, were very hesitant about using technology in daily lessons because of their lack of knowledge and experience (Stieler-Hunt & Jones, 2015). Through the literature review process, little research was identified regarding teachers’ feelings and attitudes toward working with cloud computing services such as GSuite on Chromebook in K-12 school settings;
moreover, there was nothing found during the literature review of academic research that addressed teachers’ feelings of comfort using GSuite in Canadian contexts.

GSuite’s apps provide for online collaborative practices, sharing, and giving feedback on documents immediately. This requires a particular set of pedagogical skills and a level of comfort to implement GSuite that is different from working with other technology devices such as mobile phones, iPads, and interactive whiteboards.
Chapter 3: Procedures and Methods

Description of the Research Design

This study aimed at exploring the strength of the relationship between the comfort level of teachers and the technology integration level of teachers while using GSFE in the SD #68. The significance of this relationship was used to inform the importance of the teachers’ feelings when applying cloud-computing services in the teaching and learning process. Data were collected through a survey (Appendix A) distributed to participating teachers at Nanaimo-Ladysmith public schools and analyzed with the Statistical Package for the Social Sciences (SPSS).

This present study was quantitative in design. The quantitative component of the research consisted of two sections. The first section was titled “Section 1”. It was the 42-item Teacher Technology Integration Survey (Vannatta & Banister, 2009), or TTIS. Section 1 was used to score levels of technology integration self-reported by the participants in 6 subscales: Risk Taking and Comfort with Technology, Perceived Benefits of Technology Use, Beliefs and Behaviors about Classroom Technology Use, Technology Support and Access, Teacher Administrative and Instructional Use, and Teacher Communication Use (Vannatta & Banister, 2009). This was the first score of each participant. The second section, “Section 2”, a 14-item questionnaire with 2 subscales. The first nine items were adapted with permission from Vannatta & Banister’s (2009) TTIS subscale for “Risk taking behaviors and comfort with technology”. These nine items were modified to develop “Risk Taking and Comfort with GSuite”. The last five items were used as unmodified items from Techsoup’s 2012 Global Cloud Computing Survey (Lim, Grönlund, & Andersson, 2015) to specifically measure general comfort with regard to cloud privacy and data protection. This self-reported level of comfort was used as the second score of each participant.
Two scores were obtained from each participant, one for self-reported levels of comfort using GSFE and one for self-reported levels of technology integration. The PI of the present study used those two scores and correlational techniques to describe the degree of the relationship between the teachers’ self-reported levels of comfort using GSFE and teachers’ self-reported levels of technology integration. The degree of the relationship was illustrated using Pearson’s \( r \) correlation coefficient.

**Description of the Sample**

SD 68 has approximately 2,000 employees allocated among 28 elementary schools (K-7), 6 secondary schools (Grades 8-12), and one Distributed Learning school, Island ConnectED (K-12). The target population of this study was 105 teachers from a possible total of seven secondary public-schools in SD68 as all the teachers in these schools are provided GSuite accounts to use Google’s cloud-computing applications such as Classroom, Gmail, Drive, Calendar, Docs, Sheets, Slides, and Sites. implement in their teaching-learning process.

According to the email lists publicly available on schools’ staff directory webpage, the specific number of teachers from each school are:

- Cedar Community Secondary: 16 teachers
- Dover Bay Secondary School: 76 teachers
- John Barsby Secondary: 40 teachers
- Island ConnectED (K-12): 16 teachers
- Ladysmith Secondary: 24 teachers
- Nanaimo District Secondary: 58 teachers
- Wellington Secondary: 40 teachers
In order to equalize potential participant rates, and attempt to adjust for potential overrepresentation per school, the PI decided to set 15 as the maximum number of teachers who could take part in the study from each school. This was based on a potential full participation rate at the smallest locations.

**Description of Instrument Used**

The instrument that was referred to collect technology integration scores in this study contained 42 items. This survey has developed and tested by Vannatta & Banister (2009). The survey included 6 factors with different scales. *Risk-taking behaviors and comfort with technology* factor consisted of nine items and applied 4-point Likert scale, ranging from “strongly disagree” to “strongly agree”. Five items of *perceived benefits of using technology in the classroom* factor applied 4-point Likert scale of agreement. *Beliefs and behaviors about classroom technology use* factor had six items and applied 4-point Likert scale of agreement. *Technology Support and Access* factor included nine items. Five of them were measured 4-point Likert scale of agreement. The rest four items were measured by the flowing scale: 1= Not available/present in my building; 2=Available but not accessible; 3=Available but have limited access; 4=Available and have easy access. Finally, *Teacher administrative and instructional use* and *Teacher communication use* factors applied five-point scale: never, once or twice a year, several times a year, several time a month, and several times in a week.

As recommended by Pickett (2009), exploring teachers’ feelings of comfort could predict the technology integration in classrooms. TTIS developed by Vannatta & Banister (2009) was one of a few teacher surveys that included the subscale of *Risk-taking behaviors and comfort with technology*. The survey aimed to looking for more insight of emotions, beliefs and
accessibility from teachers’ use of technology more than just measured how much the teachers use technology in school setting (Vannatta & Banister, 2009).

Aiming to examine teachers’ feelings of comfort using GSuite, the Risk-taking behaviors and comfort with technology subscale was modified to become the first subscale in section 2 of the present survey instrument. The last five items were used as unmodified items from Techsoup’s 2012 Global Cloud Computing Survey (Lim et al., 2015). The Techsoup Global survey was used in 88 countries to collect data about using cloud computing. The survey was comprehensively design by Techsoup Global, a for profit non-government organization focusing on market research. The items regarding data privacy and online security was picked to form the second subscale in section 2 of the present survey instrument.

**Explanation of the Procedures Followed**

Following approval from the Research Ethics Board (REB) at Vancouver Island University on October 2019 (see Appendix J), a copy of the approved research proposal and an electronic letter requesting permission to conduct the research at SD68 was sent through email to the executive assistant of Office of the Deputy Superintendent/Assistant Superintendents. The research proposal got the approval in principle by SD68 Assistant Superintendent, Secondary on November 22, 2019 (see Appendix K) with an attachment of the contact list of secondary schools. The PI sent recruitment for participation emails (see Appendix C) directly to 7 secondary school principals/vice principals to ask for 30-minute meeting to discuss their possible support with (1) assigning a research assistant if possible; (2) posting a poster in school’s staff room (see Appendix E); (3) providing an area for picking up 15 survey packages allotted per school; (4) sending a recruitment email to the teachers visa school distribution lists (Appendix F); and (5) keeping the identity of potential participants confidential.
The paper-based survey was administered in a package that included a survey cover letter (see Appendix G) that gave deep details about the study, the survey instrument (see Appendix I), and a pre-addressed stamped envelope with the PI’s name and address in the “from” and “to” areas (see Appendix H). Participants could keep the cover letter for their information. The cover letter explained purpose of the research, potential risks, and that returning survey to the PI was a sign of consent. Once surveys were mailed to the PI and the PI received it, participants could not withdraw their data from the study. As long as the survey was anonymous, the PI could not track the data provided by specific participants. The PI did not anticipate any incidental findings as responses were limited to survey items on the Likert scale. Any participants unsolicited comments written by participants were disregarded.

Using paper-based survey, the PI minimized the risk regarding loss of privacy, loss of status, loss of reputation, or loss of professional/employment opportunities. The PI designed an anonymous survey that did not collect identifying personal information or require a signed consent form. The only persons who might identify potential participants were the research assistants or the principals from the schools. However, the they could only identify people picking up survey packages. Research assistants or the principals were not involved in collecting surveys. They did not know who participates and did not be involved in data transcription or analysis. Additionally, the survey highlighted feelings of technological inadequacies for particular teachers with pre-existing concerns; however, the overall risk was minimal and important for identifying teacher needs that would be addressed by schools in future interventions.
Discussion of Validity

As a part of the questionnaire was modified by the author of the present study, it was important to ensure that the personal biases towards technology and education were managed in order to enhance the credibility of the data and findings. The PI of this study is a digital native (Prensky, 2001) who grew up in the digital age, is familiar with technology experiences, and views technology as a tool to enhance many aspects of life. The PI has relevant experience integrating technology in creating new educational tools and curriculum in Vietnam. The most successful project was KIDREC, a mobile application to promote awareness of Social and Emotional Learning among Vietnamese parents and teachers. The projects have been awarded as the best mobile application by Facebook Vietnam and EdTech Asia in 2016. From September 2017, the PI has been pursuing VIU’s Master of Education program, where she has been trained and educated regarding graduate knowledge and research skills. Moreover, taking the MEDL 550 Research in Education course also equipped the PI with foundation knowledge and skills to review literature, design research tools, and analyze the research data. The PI has completed the Tri-Council Policy Statement: training regarding Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE) (see Appendix A) and has attended the Education Ethics Boot Camp provided by university’s Research Ethics officer. The findings of the present study were always put under the idea of critical awareness and analyzed under the support of literature.

Description and Justification of the Statistical Techniques Used

Following the data collection, data were manually keyed in Excel, and SPSS (Statistical Package for the Social Sciences) Version 22 was used to performed necessary data analysis.
Means and standard deviations was used as descriptive statistic to summarize the responses of the 56 Likert-scale items. Frequency table was used to present the data.

Because the items in section 1 have applied different Likert scales across 4 and 5 points, the PI postulated that it could be beneficial to convert these to a common measurement scale. In the study, the PI converted each scale to a common 10-point scale of 1-10 with a formula based in IBM support website for SPSS statistic (“Transforming different Likert scales to a common scale,” 2016).

Correlational research was used by the author of the present study to clarify the understanding of the phenomena in which teachers had different levels of comfort when using cloud-computing technology in school settings by identifying the relationship between teachers’ reported feelings of comfort using GSuite and teachers’ reported technology integration levels. The degree of the relationship was illustrated using the Pearson $r$. Variables were expected to be highly related (when correlations beyond +.40 or -.40 are obtained). In addition, as another purpose of correlational research is making predictions (Fraenkel, Wallen & Hyun, 2012), the author of the present study expected to test the initial hypothesis that teachers with high technology integration levels would be likely to have high levels of comfort in using cloud-computing services in daily lessons. The prediction could be illustrated through the use of scatterplots thanks to the regression line, which was calculated mathematically.
Chapter 4: Results

The purpose of the present study was to determine the relationship between public secondary school teachers’ general technology integration levels and feelings of comfort using Google Suite for Education (GSFE or GSuite) in Nanaimo-Ladysmith public schools (SD68) in British Columbia, Canada. This chapter provides the data results of a paper-based questionnaire, Technology & GSuite Integration Survey (Appendix I). This survey instrument was created in two survey sections titled “Section 1” and Section 2”. Section 1 was composed of the 42-item Teacher Technology Integration Survey (Vannatta & Banister, 2009), or TTIS. Section 1 was used to identify the self-reported general technology integration levels of teachers in 6 subscales: Risk Taking and Comfort with Technology, Perceived Benefits of Technology Use, Beliefs and Behaviors about Classroom Technology Use, Technology Support and Access, Teacher Administrative and Instructional Use, and Teacher Communication Use (Vannatta & Banister, 2009). Section 2 consisted of a 14-item questionnaire with 2 subscales. The first nine items were adapted with permission from Vannatta & Banister’s (2009) TTIS subscale for “Risk taking behaviors and comfort with technology”. These nine items were modified to develop “Risk Taking and Comfort with GSuite”. As privacy and data collection were common concerns regarding the application of cloud-computing technology in educational settings (Bristow, Dodds, Northam, & Plugge, 2010; Lim et al., 2015; González-Martínez et al., 2015), the last five items were used as unmodified items from Techsoup’s 2012 Global Cloud Computing Survey (Lim, Grönlund, & Andersson, 2015) to specifically measure general comfort with regard to cloud privacy and data protection.

The study was guided by the research question: What relationships exist between public secondary school teachers’ levels of technology integration in general, and their feelings of risk-
taking and comfort with integrating GSuite in Nanaimo-Ladysmith public schools (SD #68) in British Columbia, Canada? The author of the present study rejected the null hypothesis. The research hypotheses were as follows:

H1a. The research data will demonstrate that teachers reporting significantly higher levels of general technology integration will also report high feelings of comfort and perceive fewer risks of implementing GSuite.

H1b. The research data will demonstrate that teachers reporting significantly lower levels of general technology integration will also report low feelings of comfort and perceive more risks of implementing GSuite.

Out of seventy-five surveys delivered directly to the research assistants for distribution in five secondary public schools (fifteen surveys packages for each), twenty-three surveys were returned to the author of the present study through self-addressed stamped envelopes with the author of the present study’s address already provided on the “Return Address” location on an envelope (Appendix H) to prevent inadvertent leakage of private information. One school contacted the author of the present study by email to withdraw from the study over concerns of skewing the research data. The email implied that their teachers had been trained for technology integration likely to a higher level than that of the general district. Therefore, response rate was 28.8% in general. A response from a participant who did not fill in the questions of Section 2 but instead provided the notation “I don’t use GSuite” was excluded from the correlation analysis. Therefore, 22 valid responses, which presented 95.7% of the total surveys completed, were fully analyzed. No outliers were eliminated from the data set. Survey responses were entered in a spreadsheet by the author of the present study that then was imported into SPSS for necessary data analysis.
There were three negative statements in Section 1’s general technology integration levels (Q2, Q3 and Q5) and eight negative statements in Section 2’s feelings of comfort with GSuite (Q44, Q45, Q47, Q52, Q53, Q54, Q55, and Q56). For analysis purposes, the scores of those negative statements were reversed to reflect positive data by using formula below:

\[ Y = (\text{max} + \text{min}) - x \]  

Where:

\( Y \) = new reversed score  
\( x \) = reported score  
\( \text{min} \) = minimum point of scale  
\( \text{max} \) = maximum point of scale

The general technology integration level of each participant was then calculated by taking the means of 42 items in session 1. Feelings of comfort using GSuite level of each participant was also calculated by taking the means of 14 items from Section 2.

**Consistency of the Instruments**

In survey section 1, the study found Cronbach’s alpha value of \( \alpha = .73 \) for the general technology integration levels for responses in Section 1. The specific reliability for Risk Taking and Comfort with Technology subscale was high (\( \alpha = .79 \)). In survey section 2, The overall reliability for the feelings of comfort using GSuite levels in the present study was quite high (\( \alpha = .88 \)) which is quite high. The study also observed similarly high Cronbach’s alpha values for Risk Taking and Comfort with the GSuite subscale and the Comfort with Privacy and Data
Protection subscale ($\alpha = .87$ and $\alpha = .89$ respectively). Therefore, reliabilities of all the sections in this study were satisfactory.

**General Technology Integration Levels**

The general technology integration levels section contained 42 questions. This survey was developed and tested by Vannatta & Banister (2009). The survey included six subscales with different Likert scales. The data of this section are summarized in Table 4.1 (with the scales for negative items Q2, Q3 and Q5 reversed for scoring purposes). The average response rating for each question with a four-point scale ranged from 2.17 (Q18 - When planning instruction, I consider state and national technology standards) to 3.74 (Q28 – Available and easy access of mobile computer lab). Vannatta & Banister (2009) reported in their study that Q28 just had a mean score of 1.83. The differences between the current study and that of Vannatta & Bannister (2009) may point out that technology accessibility has changed remarkably within the intervening 10 years. The average response rating for each question with five-point scale ranged from 1.87 (Q33 – I prepare or maintain IEPs on the computer) to 5.00 (Q36 – I use email to communicate with colleagues and administrators in my school/district), a maximum record. Vannatta & Banister (2009) also recorded a mean score of 4.78 for this question.

Table 4.1

| Response | 1 | 2 | 3 | 4 | 5 | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | Mean | SD |
| Risk-taking behaviors and comfort with technology | 3.13 | .39 |
| Q1 | 0 | 0 | 0 | 0 | 13 | 57 | 10 | 43 | 0 | 0 | 3.43 | .51 |
| Q2 | 1 | 4 | 4 | 17 | 11 | 48 | 7 | 30 | 0 | 0 | 3.04 | .82 |
| Q3 | 0 | 0 | 3 | 13 | 13 | 57 | 7 | 30 | 0 | 0 | 3.17 | .65 |
| Q4 | 0 | 0 | 5 | 22 | 15 | 65 | 3 | 13 | 0 | 0 | 2.91 | .60 |
| Q5 | 1 | 4 | 2 | 9 | 15 | 65 | 5 | 22 | 0 | 0 | 3.04 | .71 |
| Q6 | 0 | 0 | 3 | 13 | 11 | 48 | 9 | 39 | 0 | 0 | 3.26 | .69 |
| Q7 | 1 | 4 | 2 | 9 | 14 | 61 | 6 | 26 | 0 | 0 | 3.09 | .73 |
The descriptive statistics per subscales are also presented in table 4.1. The mean score (M = 4.41, SD = 0.53) for teacher communication use was very high. Vannatta & Banister (2009)
reported a lower mean score of 3.58 (SD = 0.92) for this subscale, which is significantly lower than the current study. However, both this present study and Vannatta & Banister (2009) reported low mean scores for the Beliefs and Behaviors about Classroom Technology Use subscale (M = 2.70 and M = 2.80 respectively).

General technology integration levels were calculated by taking the means of 42 items. However, because these items have applied different Likert scales across 4 and 5 points, the author of the present study postulated that it could be beneficial to convert these to a common measurement scale. In the study, the author of the present study converted each scale to a common 10-point scale of 1-10 with a formula based in IBM support website for SPSS statistic (“Transforming different Likert scales to a common scale,” 2016):

\[
Y = (10 - 1) \frac{(x - \text{min})}{(\text{max} - \text{min})} + 1
\]  

(2)

Where:

\[
Y = \text{new score}
\]
\[
x = \text{reported score}
\]
\[
\text{min} = \text{minimum point of scale}
\]
\[
\text{max} = \text{maximum point of scale}
\]

Therefore, reported scores of items with 4-point Likert scale were converted as 1 = 1, 2 = 4, 3 = 7, 4 = 10. Using the same formula, reported scores of items with 5-point Likert scale were converted as 1 = 1, 2 = 3, 3 = 6, 4 = 8, 5 = 10. Then, general technology integration levels were calculated by taking the means of 42 items with the same new 10-point Likert scale.
Table 4.2

Summary of General Technology Integration Levels Scores

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>5.97</td>
</tr>
<tr>
<td>Maximum</td>
<td>8.06</td>
</tr>
<tr>
<td>Mean</td>
<td>7.09</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.67</td>
</tr>
</tbody>
</table>

\( N = 23 \)

With this new scale, Table 4.2 presents the descriptive statistics of general technology integration levels. The minimum score of 5.97 exhibits that all the participants’ general technology integration levels were reported as higher than average. The mean score of 7.09 shows that a significant portion of participants perceive themselves as having fairly high levels of general technology integration.

Feelings of Comfort with GSuite Levels

The Feelings of Comfort with GSuite subsection has 14 items. The first nine (from Q43 to Q51) items were modified from the Risk Taking and Comfort with Technology subscale from the TTIS survey (Vannatta & Banister, 2009). The last five items were from Techsoup’s 2012 Global Cloud Computing Survey (Lim, Grönlund, & Andersson, 2015) and constitute a subscale to measure general comfort levels of teachers regarding cloud privacy and data protection.

Twenty-two participants answered all these items. According to details of Section 2 responses, which are summarized in table 4.4, the average response rating for each question ranged from 2.36 (reversed Q52 - I have concerns about regulatory requirements such as privacy legislation) to 3.36 (Q43 - I feel comfortable about my ability to work with GSuite). Data from all five items from Techsoup’s 2012 Global Cloud Computing Survey (Lim, Grönlund, & Andersson, 2015) presented mean scores higher than 2.35 and lower than 3.00.
Table 4.3

Section 2 Response Data by Questions

<table>
<thead>
<tr>
<th>Response</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk taking and comfort with GSuite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.06</td>
<td>.47</td>
</tr>
<tr>
<td>Q43</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Q44</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>14</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Q45</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>18</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Q46</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>18</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Q47</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Q48</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>18</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Q49</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>14</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Q50</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>18</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Q51</td>
<td>9</td>
<td>9</td>
<td>4</td>
<td>18</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Risk taking and comfort with privacy and data protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.52</td>
<td>.63</td>
</tr>
<tr>
<td>Q52</td>
<td>14</td>
<td>14</td>
<td>9</td>
<td>41</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Q53</td>
<td>14</td>
<td>14</td>
<td>8</td>
<td>36</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Q54</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>41</td>
<td>41</td>
<td>1</td>
</tr>
<tr>
<td>Q55</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>23</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Q56</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>41</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Risk taking and comfort with GSuite levels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.86</td>
<td>.43</td>
</tr>
</tbody>
</table>

N = 22

Figure 4.1 displays the distribution of Feelings of Comfort with GSuite. Feelings of comfort with GSuite has a potential range of 1.00 to 4.00. Figure 4.1 indicates that 50% of the participants had feelings of comfort with GSuite higher than 3.00.
Figure 4.1 Distribution of feelings of comfort using GSuite scores.

Correlation between General Technology Integration Levels and Feelings Comfort with GSuite.

The relationship between general technology integration levels and feelings of comfort with GSuite was assessed with the help of Pearson’s Product-Moment Correlation Coefficients. The correlation analysis indicated a significant positive relationship between two variables. The correlation coefficient was found to be $r = 0.670$ at $p < 0.01$. The positive significant relationship shown by the Pearson $r$ is consistent with the dense distribution of points, as the scatterplot shows in Figure 4.2.
Figure 4.2 illustrates the degree of the relationship between general technology integration levels and feelings of comfort with GSuite. It also displays Pearson’s \( r \) and a line best fit. The study data is displayed as a collection of points, each having one variable determining the position on the x-axis (general technology integration) and one other variable determining the position on the y-axis (feelings of comfort with GSuite). \( R^2 \) Linear shows the variation explained in one variable by the other is 45%.

Figure 4.2. General technology integration levels and risk taking and comfort with GSuite levels.
The range of data points are found primarily between 5.0 and 8.0 for general technology integration: this demonstrates a fairly high level of general technology integration among the participants. Moreover, a range of feelings of comfort with GSuite were also displayed with the data points falling between 2.0 and 4.0. (See Figure 4.2.)

A line of best fit was drawn to determine the trend in the data. The direction of the line of best fit shows a positive association between general technology integration levels and risk taking and comfort with GSuite. The positive association argues that high levels of general technology integration corresponded with high levels of comfort feeling with GSuite. This finding supported the author of the present study’s hypothesis H1a (The research data will demonstrate that teachers reporting significantly higher levels of general technology integration will also report high feelings of comfort and perceive fewer risks of implementing GSuite).

Other Correlations.

Feelings of comfort with GSuite and items with different scales

Concerning that the general technology integration levels has been calculated by taking the means of 42 items which were converted to a same 10-point Likert scale, the author of the present study wanted to test the correlations between levels of taking risks and comfort with GSuite and the items with different original Likert scales. There are three different type of scales used in Section 1: an Agreement subscale which focuses on teachers’ beliefs about technology (from Q1 to Q25), the Technology Availability subscale (Q26, Q27, Q28, and Q29), and Frequency of Using Technology subscale (from Q30 to Q42). Each of these scales were represented by three mean scores of the respectively items. (See Table 4.5.)
Table 4.4

*Correlations between feelings of comfort with GSuite levels and different type of scales*

<table>
<thead>
<tr>
<th>Risk Taking and Comfort with GSuite</th>
<th>Agreement Subscale</th>
<th>Availability Subscale</th>
<th>Frequency Subscale</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r$</td>
<td>.622**</td>
<td>-.033</td>
<td>.260</td>
</tr>
<tr>
<td>$p$</td>
<td>.001</td>
<td>.442</td>
<td>.121</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (1-tailed).

Table 4.5 summarizes the relationship between Risk Taking and Comfort with GSuite and the three subscales of Agreement, Availability, and Frequency. These relationships were assessed with the help of Pearson’s Product-Moment Correlation Coefficients. The correlation analysis showed a significant positive relationship between feelings of comfort with GSuite and the Agreement Subscale: the $r$ value was 0.622, p value was 0.001 such that $p<0.01$. In contrast, the correlation analysis revealed items with Availability and Frequency subscales had non-significant relationships with feelings of comfort with GSuite.

**Feelings of comfort with GSuite and risk taking and comfort regarding general cloud privacy and data protection**

Within the Section 2 of the survey, two mean scores were calculated to represent risk taking and comfort with GSuite (from Q43 to Q51) and comfort regarding general cloud privacy and data protection (from Q52 to Q56). Applying Pearson’s Product-Moment Correlation Coefficients, the correlation analysis indicated non-significant positive relationship between the two subscales. The correlation coefficient $r$ was 0.341, and the p value was 0.121 which was such that $p>0.05$. 
Chapter 5: Discussions and Conclusions

First integrated by higher education institutions, cloud-computing technology strongly benefited collaborative learning (Denton, 2012; Lim et al., 2015; Gonzalez-Martínez et al., 2015; Wang et al., 2017;). It also satisfied cost-cutting purpose to remain competitive within the higher education industry thanks to flexible operational models and scalability (Gonzalez-Martínez et al., 2015). Focusing more on the public K12 educational system in BC, Canada, the overall goal of this present study was to research teachers’ feelings of comfort using GSuite when confronting a big demand for using “free” cloud-computing technologies in schools settings—a situation that has not been researched specifically with the last 10 years (Gonzalez-Martínez et al., 2015). To improve teachers’ feelings of comfort using GSuite, it was necessary to examine several factors that might impact teachers' using GSuite in classrooms. Hence, the main purpose of this study is to discover if a relationship exists between secondary public-school teachers' general integration technology and their feelings of comfort using GSuite; and if a relationship exists, the strength of that relationship. The secondary objective of this research is to expand knowledge about the factors that may be related to teachers’ feelings of comfort using GSuite in relation to 6 subscales taken from the literature addressing technology adoption in education. Teachers' general technology integration and teachers' feelings of comfort using GSuite were examined through a paper-based survey designed in 2 sections with 8 subscales in total. As hypothesized, the data showed that teachers' general integration of technology was significantly related to teachers' feelings of comfort using GSuite. However, there were also some unexpected findings implied by the data, suggest directions for future research.
Feelings of Comfort using GSuite May Be Improved by Developing Teachers' Technology Integration

During its prior singular existence as a stand-alone app, Google Docs was one of the more highly studied cloud-computing applications studied in the education technology literature where it was contextualized as a part of the general technology integration in school settings (Denton, 2012; Wang, 2017; Woodrich et al., 2017; Marlatt, 2019). Eventually the benefits of GSuite as a collection of apps went beyond collaborative documents but so did the number of significant issues regarding, for example, data privacy, technology infrastructures, and internet stability in its implementation (El-Gazzar et al., 2016).

The study identified a positive correlation between teachers' feelings of comfort using GSuite and their general technology integration. Teachers with higher levels of technology integration would have higher levels of comfort feelings using GSuite in schools. The data of the present study indicated that the sample population had a fairly high level of technology integration and most had a fairly high level of comfort with GSuite use: 50% of participants stated they felt comfortable using GSuite in school. This finding suggests that teachers' general technology integration should be considered when planning a GSuite implementation. This is consistent with findings of prior research that general technology integration levels of teachers would impact their feelings using technology in classrooms (Pickett, 2009; Sahin et al., 2016). This research also echoes the studies showed that teachers with high levels of technology integration would be more confident and motivated using Google Doc, an app including in GSuite (Denton, 2012; Wang, 2017; Woodrich et al., 2017; Marlatt, 2019). However, this finding might not imply that participating teachers have fully considered the implications of using GSuite, in particular its design as a cloud computing suite. Like all cloud-computing,
GSuite can pose particular risks to student privacy—a key consideration in BC public education under the rigors of BC’s Freedom of Information & Protection of Privacy Act (1996, c 165). Future research should investigate whether additional teacher training in identifying and managing risks related to personal information, privacy, and cloud computing would improve the technology culture in school settings (Bristow et al., 2010; Lim et al., 2015; Gonzalez-Martínez et al., 2015) and impact teachers' feelings of comfort using GSuite.

It is worth noting that the data of the present study only indicated a relationship between technology integration and their feelings of comfort using GSuite: Correlation does not imply causation. Moreover, because correlation-coefficients were acquired by standardizing the covariance between the subscales with different Likert scales, further research is needed on the reliability of the standardization process and its effects on the data analysis processes.

Beyond the findings initially hypothesized in this study, the data analysis also highlighted some unexpected findings regarding correlations involving Feelings Comfort Using GSuite, Technology Availability, Frequency of Using Technology, Risk-taking and Comfort with GSuite, and Comfort regarding General Cloud Privacy and Data Protection subscales in this study.

**Correlation between Feelings Comfort Using GSuite and Technology Availability**

In his study about the barriers to adopting emerging technologies in education, Rogers (2000) mentioned that the decreased availability and accessibility of necessary hardware and software decreased use of technology in educational settings. As a consideration in teachers’ general technology integration, one might then expect that technology availability could positively contribute to increasing teachers' feelings of comfort using GSuite. However, in contrast to Rogers’ (2000) research, this study found only a very slight correlation between technology availability and teachers’ feelings of comfort using GSuite. This may indicate that
even when technology was highly available in schools, teachers may still feel uncomfortable using GSuite in their daily teaching activities. The findings of this study indicated that providing technology facilities is not adequate on its own to help teachers feel comfortable using GSuite to benefit teaching and learning. Future research should pursue potential relationships between teachers’ feelings of comfort with GSuite and adequate GSuite training or frequency of GSuite use.

**Correlation between Feelings Comfort Using GSuite and Frequency of Using Technology**

The items used to measure the Frequency of Using Technology in this study came from the TTIS (Vannatta & Banister, 2009) which focused on quite specific technical skills for teaching, learning, and communicating. In their study, Vannatta and Banister (2009) noted that previous surveys tended to measure frequency of use solely by how often teachers used those technologies and did not consider how teachers used those technologies to benefit teaching and learning. Vannatta and Banister (2009) set out to develop a better instrument to measure “a variety of beliefs and behaviors with respect to classroom technology use” (p.2). In this present study, teachers’ self-reported frequency of general technology use demonstrated no significant relationship to teachers’ feelings of comfort using GSuite. The study findings identified that teachers with a low frequency of using technology may still feel comfortable using GSuite to accelerate new learning experiences for students. This finding might indicate that GSuite should not be considered the same as general technology skills as it provides special opportunities for collaborative learning that may influence teacher use (Denton, 2012; Wang, 2017; Woodrich et al., 2017; Marlatt, 2019).

In addition, it should be noted that the technology skills mentioned in the items with a frequency scale from Vannatta and Bannister’s (2009) were popular skills at that time, a decade
ago now—but technology changes rapidly. These specific skills may no longer be relevant in the present contexts of participating public schools. This could explain the apparent inverse relationship of a low frequency value of general technology use with teachers’ feelings of comfort using GSuite. Another item of note was the maximum value participants attributed to using email to communicate with colleagues in this present study versus the findings of Vannatta and Bannister (2009). This finding was aligned with the BCTF Digital Report (BCTF research, 2017) report that email was one of the two topmost frequently used digital reporting tools among BC public K12 teachers.

**Correlation Between Risk-taking and Comfort with GSuite and Comfort regarding General Cloud Privacy and Data Protection**

Some studies focusing on cloud-computing in education identified online privacy and data protection as important concerns among different educational stakeholders (Bristow et al., 2010; Lim et al., 2015; González-Martínez et al., 2015). These studies suggest we should expect a strong correlation between teachers’ feelings of comfort and risk taking with GSuite and their feelings of comfort regarding cloud privacy and data protection. Yet the findings of this present study were not consistent with the concerns researchers have identified elsewhere regarding cloud privacy and data protection. The data from this current study demonstrated only a weak correlation between teachers’ feelings of comfort and risk-taking with GSuite and their comfort regarding cloud privacy and data protection. This may suggest that even when teachers have strong skills using GSuite in schools, they may be indifferent to issues identified in the literature regarding cloud privacy and data protection. This result is interesting given BC’s strict public sector privacy laws governing cloud computing—especially when it involves the transfer, access, or storage of personal information external to Canada. In contrast to the weak relationship found
in this study between teachers’ feelings of comfort with GSuite and their feelings of comfort about cloud privacy and data protection, parents across BC have expressed strong concerns about the use of GSuite, many of which are related to cloud computing and the use of personal information. Many parents in BC refused to sign consent letters to let their children have GSuite account in BC public K12 schools (Desson, 2018; Malkin, 2018; Bresnahan, 2018). A parent has shared her worry that “I think our main concern is that there it is quite a lot of information that is going to get accumulated through … my daughter's educational life," (Desson, 2018). Further research in the uptake of GSuite should investigate whether privacy and data protection concerns might pose barriers to teachers’ feelings of comfort and risk taking with GSuite in their classrooms. Investigating those concerns could provide a valuable starting point to overcome some barriers to GSuite use. As the controversy intensifies over GSuite use about privacy and security, prompt and reliable training on the integration of cloud-computing services in education need to be done to generate more knowledge for educational stakeholders and potentially contribute to risk identification and mitigation.

**Limitations and Suggestions for Further Research**

The present study is a prompt response to González-Martínez et al. (2015) that there was a need of research focusing on teachers’ demand regarding using cloud computing technology in schools. The paucity of research in this area limited the necessary resources to create the best theoretical framework to bold the present study. As a result, there are several limitations to the present study worthy of mention.

First, the small number of participants, the number of schools involved, and their location within a single district, limits the generalizability of the results. To determine further generalizability, future research could involve a purposeful sampling of schools and teachers
across the province. In addition, research involving other provinces and territories with potentially different teacher training and different regulations regarding cloud computing would provide interesting comparisons. Even given the limits of generalizability at this point in time, this study can offer individual schools or other school districts a framework and instrument for investigating teachers’ feelings of comfort and risk-taking with GSuite. The findings of this study can also provide an initial comparison data set.

Second, since this study’s data collection instrument relied exclusively on teacher self-reporting, the results of this present study may be biased. The literature suggests that such bias may cause by a misunderstanding of what a proper measurement is, or “social-desirability bias, where the respondent wants to ‘look good’ in the survey, even if the survey is anonymous” (Rosenman, Tennekoon, & Hill, 2011, p. 2). This is not to say that there is not a place for self-reporting data in this area of research; however, future research should consider including additional data collection through direct observation to improve on the accuracy of data collection around actual versus reported teacher use of—and reactions to—GSuite in school settings.

Third, since the basis of the current study’s survey items were taken from the 2009 TTIS (Vannatta & Banister) study, they did not necessarily address new technology skills and cloud-computing technology services that have evolved and proliferated in the past 10 years. It is recommended that new survey tools—or items—should be composed that reflect more current technologies used or required by teachers in Canadian public schools. Ongoing research in this area will require that such surveys keep pace with current technologies in use in educational contexts.
A final limitation to note relates to the data collection and analysis methodology of this study. This study identified an inherent data analysis issue presented by the 4-point Likert scale items and the 5-point Likert scale items replicated from the original survey of Vannatta and Bannister (2009). As the current study’s instrument attempted to closely follow Vannatta and Bannister (2009), this study had to address the issue of comparing items from a 4-point and 5-point scales during data analysis. The current study addressed this data analysis issue by mathematically standardizing measurement from the 4 and 5 points scales through mathematical conversion to 10-point scales. Although this approach has some basis in literature from scientific research (Sambandan, 2006) and in online discussions related to data analysis in natural science studies on platforms such as researchgate.net, this mathematical standardization of measurement was an experimental approach and was not tested or used in prior research regarding education technology. The new Likert point scale conversion/standardizing method developed for data analysis in this current study may introduce unexpected data analysis errors. Furthermore, as Vannatta and Barrister’s original work in 2009 did not address the differences in the 2 sets of Likert scales, direct comparisons the data analysis of this study may problematize direct comparisons with those of Vannatta and Bannister (2009). The finding reported here should only be considered provisional and suggestive until further research can be conducted.

Conclusion

In addition to providing an experimental scale conversion/standardizing data analysis method, this study provides new data about relationships between teachers' feelings of comfort using GSuite in public K12 school settings and general technology integration of teachers in British Columbia that may have applications for other jurisdictions. The findings indicate that among the participants, teachers’ general level of technology integration has a strong correlation
with teachers’ feelings of comfort using GSuite. The findings of this present study also suggested new understanding related to teachers’ feelings of comfort using GSuite in the context in SD68. Perceptions of teachers toward GSuite was specifically more complex than regular education technology. Further research is in need to explore the factors that would impact the using of GSuite in school context. More importantly, understanding teachers’ feelings and perceptions may suggest training plans to equip teachers with proper skills and knowledge about the benefits and risks using GSuite. Due to the early and emergent nature of such research regarding GSuite and cloud computing use in public K12 schools in British Columbia, the findings provide initial practical insights regarding GSuite implementations that may have wider applications for cloud-computing technology in education.
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https://doi.org/10.31269/triplec.v10i1.304


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Hengstler, J. (2019, April 21). Personal communication.


https://doi.org/10.1504/IJBHR.2011.043414


doi:10.1108/0264047111125177


APPENDIX A - Tri-Council Policy Statement: training regarding Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE)

Certificate of Completion

This document certifies that

Vi Ly

has completed the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE)

Date of Issue: 14 January, 2018
APPENDIX B – PRINCIPAL/SCHOOL RECRUITMENT EMAIL FOR USE BY THE SUPERINTENDENT’S OFFICE OR DESIGNATE

[Date], 2018
Ly Thuy Vi
A Student in the Master of Education in Educational Leadership
Vancouver Island University
Nanaimo, British Columbia

Hello,

My name is Vi Ly and I am a student in the Master of Education program at Vancouver Island University. In partial fulfillment of my requirements for a Master’s thesis in Education, I would like to ask for your help in recruiting up to 15 teacher participants and a support contact for my research study entitled “Cloud computing in school: Teachers’ feelings of comfort while integrating GSFE in school contexts”. The purpose of my research is to compare teachers’ feelings of comfort regarding the general integration of education technology with their feelings of comfort regarding GSuite integration. Research around GSuite integration is virtually non-existent for Canadian schools and I believe that through your teachers’ professional experiences, they can contribute rich information regarding this study. My research study has been approved by both School District 68’s administrative offices and Vancouver Island University’s (VIU’s) Research Ethics Board.

For my study, I would like to ask your support for the following:
1) to suggest a person/location in the school where the 15 teacher survey packages could be stored for individuals to pick up and who might be willing to post 1-2 recruitment posters (to be provided) in high-visibility location like a staff room or photocopy room; (Note: It will be important that this contact person is able to keep the identity of people collecting survey packages confidential); I will email or call the contact person after 2 weeks to determine what number of survey package remain and collect unused surveys after an additional 2 weeks;
2) to forward my teacher recruitment email to your teaching staff and if there is a low initial response after the first 2 weeks, to send the recruitment email a second time.

In this study, teacher participants are asked to complete a closed-ended printed questionnaire of 56 Likert items (approximate completion time: 25-30 minutes) in a location of their choice and mail the completed survey back to me in a pre-stamped, pre-addressed envelope provided in the survey package. have attached a PDF copy of the teacher survey package, recruitment poster, teacher recruitment email, and contact person recruitment email for your review. The survey package information attached includes the survey cover letter, survey, and a mock-up of the stamped address envelop that would be provided to teacher participants. Each of the 15 teacher survey packages would be provided by me in separate sealed envelopes. The survey presents minimal risks to participants: items are unlikely to be controversial; information is collected anonymously, and no personal identifying information will be collected. The survey is also designed to avoid collection of any data that could directly identify any particular school. Any
unsolicited comments or notations on survey forms will be disregarded. The data gathered will be used for my thesis which may be published on Vancouver Island University’s VIUSpace, my personal website, and the data may be used for conference presentations and written articles. Once the thesis is completed, I will forward a copy to participating school principals to share with teachers.

Please respond to [insert name of office or designated contact person] at your earliest convenience to confirm your willingness to support this study and provide a contact with whom I can leave the survey packages and posters.

For further questions please contact me at +1 (250) xxx-xxxx or xxx@gmail.com. You can also contact the VIU Research department at (250) 740-6324 or email research@viu.ca with questions or comments regarding scientific or scholarly aspects of the research.

Respectfully yours,

Vi Ly

Noted by:
Julia Hengstler
Supervising Faculty
Dear Principal,

Thank you for your interest in supporting my research study, “Cloud computing in school: Teachers’ feelings of comfort while integrating GSFE in school contexts”. Attached are two types of documents for your review: recruitment documents and the teacher survey package. More specifically:

- recruitment email to identify an individual and location from whom/where teacher participants could pick up survey packages and who would also agree to put up a recruitment poster (“research assistant”);
- the teacher recruitment poster;
- a teacher participant recruitment email that you can forward to your teachers subject to your approval;
- a copy of the survey package that will be provided to teachers: cover letter, survey, and a mock up of the preaddressed stamped envelope.

If after reviewing these materials, you are in favour of supporting this study, I ask if you would kindly:

1) contact me by email with the name and public-school district email of a person to act as a “pick-up” contact for survey packages and whom you would recommend as able to keep potential participants’ identities confidential; I will send the research assistant recruitment email to them directly on your recommendation;
2) forward the teacher participant recruitment email to your teaching staff;
3) forward a digital copy or link to the completed thesis to your teachers.

Once the survey packages are dropped off, and after contacting the “pick-up” contact to determine if there are remaining survey packages, I may contact you to ask if you can send one more email to the teaching staff. Once my research is done (expected date April 30, 2018), I will email you a copy of the thesis for you to share with your teachers.

For further questions please contact me at +1 (250) xxx-xxxx or xxx@gmail.com. You can also contact the VIU Research department at (250) 740-6324 or email research@viu.ca for questions or comments regarding scientific or scholarly aspects of the research.

Respectfully yours,

Vi Ly
Noted by:
Julia Hengstler
Supervising Faculty
APPENDIX D – RESEARCH ASSISTANT RECRUITMENT EMAIL

[Date], 2018
Ly Thuy Vi
A Student in the Master of Education in Educational Leadership
Vancouver Island University
Nanaimo, British Columbia

Dear [Contact name & email provided by principal]

Your name was suggested by your principal [Insert principal name here] for possible assistance with my research. My name is Vi Ly and I am conducting a study in partial fulfillment of my requirements for Master thesis in Education at Vancouver Island University. The purpose of my research is to compare teachers’ feelings of comfort regarding the general integration of education technology with their feelings of comfort regarding GSuite integration. Research around GSuite integration is virtually non-existent for Canadian schools and I believe the professional experiences of teachers at this school can contribute rich information regarding this study. My research study has been approved by both School District 68’s administrative offices and Vancouver Island University’s (VIU’s) Research Ethics Board.

I would like to ask for your assistance recruiting participants for this study, “Cloud computing in school: Teachers’ feelings of comfort while integrating GSFE in school contexts”. Your role would involve acting as a pick-up location/contact for 15 teacher survey packages and posting 1-2 teacher recruitment posters in a high-visibility location for teachers (i.e. a staff room or photocopy room). Two weeks after I drop off the packages and posters to you, I will contact you to determine how many survey packages remain. If any remain, I will ask your principal to send out the recruitment email once more. After 2 more weeks I will pick up any unused survey packages. I have attached a PDF copy of the teacher survey package and recruitment poster for your review. If you agree to assist me in this research, you also agree to keep the identities of the potential teacher participants strictly confidential.

Please respond at your earliest convenience to confirm your willingness to support this study and provide a convenient date & time that I could deliver the survey packages and posters to you.

Thank you for consideration. For further questions please contact me at +1 (250) xxx-xxxx or xxx@gmail.com. You can also contact the VIU Research department at (250) 740-6324 or email research@viu.ca for questions or comments regarding scientific or scholarly aspects of the research.

Respectfully yours,
Vi Ly

Noted by:
Julia Hengstler
Supervising Faculty
Teacher participants needed: Share your GSuite integration experience!

Share your experience and feelings of comfort integrating Google Suite for Education (GSuite) in SD 68. Currently there is little information about the integration of GSuite—especially in Canadian schools. This study seeks to address this gap and compare teachers’ experiences and feelings of comfort integrating technology in general with GSuite in particular.

- This study hopes to recruit 15 teachers from each GSuite-using secondary school in School District 68 (Nanaimo-Ladysmith).
- The research presents minimal risk to participants: No personal information or intentionally identifying school information will be collected from participants and the questions are unlikely to be controversial.
- The printed survey package consists of a cover letter, an anonymous 56-item closed-ended questionnaire, and a stamped envelope with the researchers’ address in both the “from” & “to” areas.
- Participants can withdraw at any time prior to mailing the survey back to the researcher.
- Once the survey is mailed to the researcher, participant consent is assumed to be granted.
- Interested teachers can pick up a survey package on a first come-first served basis at [pick-up place to be inserted when arrangements are completed with school district and participating schools].
- Any teacher participation is completely voluntary and without compensation.

The principal researcher, Vi Ly, is a Masters of Education student from Vancouver Island University (VIU) who is using the study to complete her Master’s thesis. The thesis might be posted on the VIUSpace website and the researcher’s own website. Study data might also be used in professional presentations and articles created by Vi Ly. This research has been approved by the VIU Research Ethics Board, and School District 68 administrative offices.

For further questions about this study, please contact the principal investigator, Vi Ly at (250) 740-6324 or vi@viu.ca. You may also contact the VIU Research Department regarding any scientific or scholarly aspects of the research at (250)740-6324 or research@viu.ca.

Thank you for your time and consideration,

Vi Ly
APPENDIX F – TEACHER RECRUITMENT EMAIL (TO BE FORWARDED BY PARTICIPATING PRINCIPALS)

[Date], 2018
Ly Thuy Vi
A Student in the Master of Education in Educational Leadership
Vancouver Island University
Nanaimo, British Columbia

Hello,

My name is Vi Thuy and I am conducting a study in partial fulfillment of my requirements for Master thesis in Education at Vancouver Island University. The purpose of my research is to compare teachers’ feelings of comfort regarding the general integration of education technology with their feelings of comfort regarding GSuite integration. Research around GSuite integration is virtually non-existent for Canadian schools and I believe the professional experiences of teachers like you at this school can contribute rich information regarding my study. This research has been approved by both School District 68’s administrative offices and Vancouver Island University’s (VIU’s) Research Ethics Board.

If you choose to participate, you will be asked to complete a closed-ended printed questionnaire of 56 Likert items. It should take approximately 25-30 minutes to finish. The survey package can be picked up from [insert pre-recruited assistant contact/location information for school here]. Each participating school is provided a total of 15 teacher survey packages. This will be distributed on a first come-first served basis. You can complete the survey at a convenient time and location of your choice. Once you have finished the survey, you will be asked to mail the completed survey back to me, Vi Thuy, in a pre-stamped, pre-addressed envelope provided in the survey package.

The survey presents minimal risks to participants: items are unlikely to be controversial; information is collected anonymously, and no personal identifying information will be collected. The survey is also designed to avoid collection of any data that could directly identify any particular school. Any unsolicited comments or notations on survey forms will be disregarded.

You may withdraw at any point up until mailing the survey back to me. Once surveys are mailed, you cannot withdraw your data from the study as submissions will be anonymous and I cannot separate data provided by any specific participant. By completing and returning the survey to me by mail, you voluntarily consent to participate in this study. Please return your survey before December 21, 2018.

Your school contact person [Insert name here] has been asked to keep the identity of potential survey participants strictly confidential. The records of this study will be secured in a locked file located in a safe in my home. Once I transcribe the data it will be stored electronically on my password protected computer. Only myself, and my supervisor, Prof. Julia Hengstler, will
have access to the research data. Your submitted paper survey and the research data will be destroyed after the completion date for my Master of Education program (April 30, 2019).

The data gathered from this survey will be used for my thesis which may be published on Vancouver Island University’s VIUSpace, my personal website, and the data may be used for conference presentations and written articles. Once the thesis is completed, I will forward a copy to participating school principals to share with teachers.

I hope you will consider participating in this survey and pick up a survey package from [Insert contact/location information here]. For further questions please contact me at +1 (250) or xxx@gmail.com. You can also contact the VIU Research department at (250) 740-6324 or email research@viu.ca for questions or comments regarding scientific or scholarly aspects of the research.

Respectfully yours,

Vi Ly

Noted by:
Julia Hengstler
Supervising Faculty
APPENDIX G – SURVEY COVER LETTER

[Date], 2018

Ly Thuy Vi
A Student in the Master of Education in Educational Leadership
Vancouver Island University
Nanaimo, British Columbia

Greetings,

Thank you for volunteering to participate in my research study, “Cloud computing in school: Teachers’ feelings of comfort while integrating GSFE in school contexts”. The purpose of my research is to compare teachers’ feelings of comfort regarding the general integration of education technology with their feelings of comfort regarding GSuite integration. Research around GSuite integration is virtually non-existent for Canadian schools and I believe that your professional experiences can contribute rich information regarding this study. My research study has been approved by both School District 68’s administrative offices and Vancouver Island University’s (VIU’s) Research Ethics Board.

This research asks you to complete a printed Likert survey of 56 items that should take approximately 25-30 minutes to fill out. You can complete this survey in a location of your choice. Your participation is completely voluntary. It is up to you whether you wish to answer all or some of the items. Once you have finished the survey, you would mail the survey back to me in the pre-addressed, pre-stamped envelope provided in this package.

The survey presents minimal risks to participants: items are unlikely to be controversial; information is collected anonymously, and no personal identifying information will be collected. The survey is also designed to avoid collection of any data that could directly identify any particular school. Any unsolicited comments or notations on survey forms will be disregarded. In addition, the person from whom you have picked up this survey has been asked to keep any potential participants’ identities strictly confidential. The data gathered through the survey will be used for my thesis which may be published on Vancouver Island University’s VIUSpace, my personal website, and the data may be used for conference presentations and written articles. Once the thesis is completed, I will forward a copy to participating school principals to share with teachers.

You may withdraw at any point up until mailing the survey back to me. Once surveys are mailed, you cannot withdraw your data from the study as submissions will be anonymous and I cannot separate data provided by any specific participant. By completing and returning the survey to me by mail, you voluntarily consent to participate in this study.

Please return this survey by December 21, 2018. The records of this study will be kept strictly confidential in a locked file located in a safe in my home. Once I transcribe the data it will be stored electronically on my password protected computer. Only myself, and my supervisor, Prof. Julia Hengstler, will have access to the research data. Submitted paper surveys and the research data will be destroyed after the completion date for my Master of Education
program (April 30, 2019). Though there is no consent form to be signed, please keep this cover letter for your information.

The data gathered through this survey will be used for my thesis which may be published on Vancouver Island University’s VIUSpace, my personal website, and the data may be used for conference presentations and written articles. Once the thesis is completed (approximately April 2019 or earlier), I will forward a copy to participating school principals to share with teachers.

For further questions please contact me at +1 (250) xxx-xxxx or xxx@gmail.com. You can also contact the VIU Research department at (250) 740-6324 or email research@viu.ca for questions or comments regarding scientific or scholarly aspects of the research.

Respectfully yours,

Vi Ly

Noted by:
Julia Hengstler
Supervising Faculty
APPENDIX H – SAMPLE OF SELF-ADDRESSED STAMPED ENVELOPE

From: Ly Thuy Vi
(mail address)

To: Ly Thuy Vi
(mail address)
APPENDIX I – SURVEY

Cloud Computing in School: Teachers’ Feelings of Comfort while Integrating GSFE in School Contexts

Principal Investigator
Ly Thuy Vi, Student
Master of Education
Vancouver Island University
xxx@gmail.com

Student Supervisor
Professor Julia Hengstler
Faculty of Education
Vancouver Island University
Julia.xxx@viu.ca

Technology & GSuite Integration Survey

By answering the included survey and returning it by mail to the researcher, I acknowledge reading the survey cover letter provided and voluntarily agree to participate in the study, “Cloud computing in school: Teachers’ feelings of comfort while integrating GSFE in school contexts“.

Should you have any questions, feel free to contact the researcher, Vi Ly, or the VIU Research Ethics Board: (250) 740-6324, or email research@viu.ca

Section 1:

Select the response that best represents how often the statement mirrors the instructional practices in your learning environment.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I feel comfortable about my ability to work with computer technologies.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2.</td>
<td>Learning new technologies is confusing for me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3.</td>
<td>I get anxious when using new technologies because I don’t know what to do if something goes wrong.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
4. I am confident with my ability to troubleshoot when problems arise while using technology.

5. I get anxious when using technology with my students.

6. I get excited when I am able to show my students a new technology application or tool.

7. I am confident in trying to learn new technologies on my own.

8. I enjoy finding new ways that my students and I can use technology in the classroom.

9. Learning new technologies that I can use in the classroom is important to me.

10. Using technology to communicate with others allows me to be more effective in my job.

11. Computer technology allows me to create materials that enhance my teaching.

12. Computer technologies help me be better organized in my classroom.

13. Technology can be an effective learning tool for students.

14. My students get excited when they use technology in the learning process.

15. Teaching students how to use technology is a part of my job.

16. Using technology in the classroom is a priority for me.

17. When planning instruction, I think about how technology could be used to enhance student learning.

18. When planning instruction, I consider state and national technology standards.

19. I regularly plan learning activities/lessons in which students use technology.
20. I try to model effective technology use for my students. □ □ □ □ □
21. My building principal encourages faculty to integrate technology in the classroom. □ □ □ □ □
22. Technology support is available in my building to assist with troubleshooting. □ □ □ □ □
23. A vision for technology use in our school is clearly communicated to faculty. □ □ □ □ □
24. My colleagues are committed to integrating technology in the classroom. □ □ □ □ □
25. Curriculum support is available in my building to assist with technology integration ideas. □ □ □ □ □

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Not available/present in my building</th>
<th>Available but not accessible</th>
<th>Available but have limited access</th>
<th>Available and have easy access</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. Instructor computer.</td>
<td>□ □ □ □</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Set of computers (2-5) in classroom.</td>
<td>□ □ □ □</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Mobile computer lab (cart of computers).</td>
<td>□ □ □ □</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
30. I use the computer to create instructional handouts or assessments for students.  
   | Never | Once or twice a year | Several times a year | Several times a month | Several times a week |
   | □     | □                  | □                  | □                  | □                  |
31. I use the Internet to gather information for lesson planning.  
   | □     | □                  | □                  | □                  | □                  |
32. I create electronic templates to guide student computer use.  
   | □     | □                  | □                  | □                  | □                  |
33. I prepare or maintain IEPs on the computer.  
   | □     | □                  | □                  | □                  | □                  |
34. I use a handheld device/mobile device to organize information.  
   | □     | □                  | □                  | □                  | □                  |
35. I use spreadsheet (or grading program) to maintain grade book and/or attendance  
   | □     | □                  | □                  | □                  | □                  |
36. I use Email to communicate with colleagues and administrators in your school/district.  
   | □     | □                  | □                  | □                  | □                  |
37. I use Email to communicate with students or parents.  
   | □     | □                  | □                  | □                  | □                  |
38. I post class information (homework, products) on an electronic bulletin board, website, or blog.  
   | □     | □                  | □                  | □                  | □                  |
39. I use technology to present information to students.  
   | □     | □                  | □                  | □                  | □                  |
40. I demonstrate computer applications.  
   | □     | □                  | □                  | □                  | □                  |
41. I provide/create electronic learning centers.  
   | □     | □                  | □                  | □                  | □                  |
42. I use technology to adapt an activity to students’ individual needs.  
   | □     | □                  | □                  | □                  | □                  |
Section 2:

Select the response that best represents your level of comfort when using Google Suite for Education (GSuite) in daily teaching and learning practices

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel comfortable about my ability to work with GSuite.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Learning GSuite is confusing for me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I get anxious when using GSuite because I don’t know what to do if something goes wrong.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I am confident with my ability to troubleshoot when problems arise while using GSuite.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I get anxious when using GSuite with my students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I get excited when I am able to show my students a GSuite application or tool.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I am confident in trying to learn GSuite on my own.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I enjoy finding new ways that my students and I can use GSuite in the classroom.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Learning GSuite that I can use in the classroom is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I have concerns about regulatory requirements such as privacy legislation.</td>
<td></td>
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</tr>
</tbody>
</table>
11. I have concerns about security and privacy of data (e.g., not knowing where data are stored).

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

12. I have concerns about losing control of data.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

13. I do not have enough trust in cloud service providers.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

14. I have concerns about locking-in to a specific cloud service provider.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tbody>
</table>

This is the end of the questionnaire. I thank you for your time. If you are comfortable with your answers, please return the survey to the researcher, Vi Ly, in the stamped addressed envelope provided in your survey package.
APPENDIX J - VIU RESEARCH ETHICS BOARD APPROVAL

From: Research Ethics Board
To: Ly Thuy Vi
Cc: Julia Hengstler
Subject: 2018-128-VIUS-THUY

Dear Ly Thuy Vi,

The Vancouver Island University Research Ethics Board (REB) has reviewed your application for Ethical Review for the project entitled “Cloud computing in school: Teachers’ feelings of comfort integrating Google Suite for Education in school contexts.”

I am pleased to relay that your application is approved as submitted.

For your records:
REB Protocol ID: 2018-128-VIUS-THUY
Date of Approval: November 2, 2018
Expiry Date: November 1, 2019

We wish you the very best with your research!

Sincerely,
p.p. VIU Research Ethics Board

Marina La Salle
Chair, REB
November 22, 2018

VI Ly Thuy
Master of Education
Vancouver Island University

Email: @gmail.com

Dear Sari:

Re: Request to Conduct Research: “Cloud Computing in School: Teachers’ Feelings of Comfort Integrating Google Suite For Education in Schools Contexts.”

Thank you for submitting your request to conduct a research project in our school district.

I am pleased to provide you with approval in principle. I understand that you have spoken with Pam Graham, Executive Assistant to clarify the method of communication to Principals and Schools. Please proceed with your research by obtaining agreement from the principals and teachers you wish to consult for your Survey. We are attaching the names and school locations for our 8 secondary principals.

Good luck with your research and we look forward to receiving a summary report of your results.

Sincerely,

Robyn Gray
Assistant Superintendent, Secondary

/pdg.