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Parental Involvement and Computer Literacy in Enhancing Student Virtual Learning

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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Parental involvement in the education of their children has been a focus of researchers for the past several years, especially with more parents and students opting for virtual schooling. Researchers found that parental involvement in their children's education predicted children's overall grades and social health. However, the role of parental computer literacy in parental involvement among virtual learning students had not been established. The purpose of this quantitative study was to examine whether parental computer literacy moderates the relationship between parental involvement and student grades among students attending Cyber Charter Schools. The study was guided by Bronfenbrenner's ecological systems theory. The Information and Communication Technology Skills (ICT) Scale measuring computer literacy and the Parental Academic Involvement Scale measuring parental involvement along with demographic questionnaire to measure student grade point average (GPA) were used. A multiple linear regression analysis was used, and the findings showed that there was a statistically significant moderating effect of computer literacy on the relationship between parental involvement and student GPA. Among parents who scored high on the ICT, parental involvement was not related to student GPA; however, among parents who scored low on the ICT, higher parental involvement was related to higher student GPA. These results can be used for positive social change to emphasize the role of parental computer literacy, revise existing policies, and emphasize the need for programs to educate parents about the learning platforms of their children.

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Dedication

I dedicate this study to my sons Kavi Joseph and Karan Joshua.

Acknowledgments

I would like to take this opportunity to thank my chair Dr. Patricia Loun for her professionalism and guidance in enabling me to complete this project successfully. I would also like to thank all my friends and family for their encouragement and support.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Parental involvement in the educational processes of their children is an important factor in ensuring positive academic outcomes and positive youth development. Parental involvement can be defined as parents' interaction with schools and with their children to benefit their children's education (Wang & Sheikh-Kahlil, 2013). As increasing numbers of students turn to virtual learning options, parental involvement is coming to include assisting their children with school work through virtual platforms, necessitating some degree of computer literacy among parents (Borup & Stevens, 2015). This research is unique because it addresses the under-researched area of parental involvement in a fully virtual education setting. The results of this study may provide needed insight regarding the connections between parents' computer literacy, parental involvement, and student outcomes. Results may also emphasize the importance of educating parents in the use of technology and in the processes involved in virtual learning so that parents can more effectively assist in their children's learning.

This chapter includes a description of the background, problem statement, purpose of study, research question and hypothesis, theoretical framework, nature of the study, definitions, assumptions, scope, limitations, significance, and a summary.

Background

K-12 online learning began over 20 years ago and has expanded rapidly during the last decade. The majority of enrollments are from high school students supplementing their face-to-face courses with one or two online courses. These growth trends have occurred despite attrition rates that are higher than those found in traditional brick-and-

mortar schools (Freidhoff, 2015; Miron & Gulosino, 2017). Some researchers have focused on the need to more fully engage parents in the learning process—especially in cyber schools where students spend all or most of their time studying at home (Borup et al., 2016). However, little research exists that has examined parental engagement in cyber schools, and the existing research has focused largely on parental engagement in online elementary school settings (Hasler Waters et al., 2016). The lack of research on parental engagement with older student populations is especially concerning because the majority of cyber school enrollments have occurred within high school populations (Watson et al., 2013). In a national survey with 126 cyber school participants, Gill et al. (2015) found that the most common challenge that cyber school administrators reported was low student engagement. Although low student engagement is not unique to online cyber schools, these researchers concluded that engagement was especially low in cyber schools because teachers are not physically present with their students and the school had no way to ensure that the students were actually in their seats and engaged with their coursework Based on these findings, parent engagement is especially important in cyber school programs where students learn from home because they can provide the physical presence that teachers cannot (Liu et al., 2010). However, parents tend not to fully understand the important roles that they play in online learning environments (Borup et al., 2013; Litke, 1998; Waters & Leong, 2014). Based on the premise that children are active agents who influence their parents' media use, Nelissen aVan den Bulck (2017) conducted a study investigating child-parent digital media guidance. Both children and parents reported that children guide their parents on how to use digital media and that

families where there was more child-parent digital media guidance reported more conflicts about media.

These results show that a gap exists in parental communication concerning computer skills. Parents cannot fulfill their roles as learning coaches if they are not comfortable with managing the virtual learning platform. My study identifies issues causing this gap and provides adequate solutions that may resolve these issues.

Problem Statement

Online learning appeals to a large number of high school students because it offers flexibility in participation, ease of access, and convenience (Croxton, 2014). According to Allen and Seaman (2016), more than 6.7 million high school students took at least one online course in the Fall of 2015. The observed growth rate from 2015 to 2016 in the number of students taking at least one distance course was 3.9%, which was up from 3.7% from the previous year. A total of 5.8 million students were reported as taking all their courses at a distance in the Fall of 2016.

The prevalence of online learning among high school students has increased because online learning represents collaborative-based learning that is available almost anywhere, anytime. High schools are taking advantage of the recent development in information and communication technology and embracing online teaching resources as an integral part of teaching and learning activities. These resources include text-images, videos, case studies, journals, databases, and curricula (Anshari et al., 2016).

The use of technology has advanced distance education for high school students tremendously, especially during the past decade. Virtual education provides opportunities

for high school students who, for various reasons, cannot maintain a traditional school schedule to pursue and achieve their educational goals. These students comprise those who have health issues, suffer from excessive bullying at school, are diagnosed with attention deficit hyperactivity disorder or autism, and students who must work during the day to help their families financially (Staker & Horn, 2013). Likewise, many high school students who are intensely involved in extracurricular activities find that they benefit from learning virtually because they can be flexible with class times and are not bound to specific class locations.

Parental involvement in the educational processes of their children is an important factor in ensuring positive academic outcomes and positive youth development. Parental involvement can be defined as parents' interaction with schools and with their children to benefit their children's education (Wang & Sheikh-Khalil, 2013). Home-based involvement includes a provision of structure for homework time and leisure time, as well as monitoring of schoolwork and progress (Wang & Sheikh-Khalil, 2013). Researchers have consistently reported children to learn well when their parents are actively involved in their learning, and parental support and modeling helps to enhance and secure student achievement and provide lasting educational gains (Machado-Casas et al., 2015). Positive outcomes associated with high parental involvement include reduced drop-out rates, increased grade point averages (GPA), and enhanced mental health-related directly and indirectly to emotional and behavioral engagement (Wang & Sheikh-Khalil, 2013). Brick and mortar schools offer activities that allow parents to become directly involved in the learning processes of their children because it is well known that parent

involvement is crucial to the success of a child's performance in school (Hassler et al., 2014). Similarly, Borup and Stevens (2014) found that in virtual learning situations, parents facilitating and nurturing close and trusting relationships with their children, engaging in advising and mentoring, and monitoring and motivating their children led to positive academic outcomes.

However, as increasing numbers of students turn to virtual learning options, parental involvement is coming to include assisting their children with schoolwork through virtual platforms, necessitating some degree of computer literacy among parents (Borup & Stevens, 2015). Machado-Casas et al. (2014) found that children learn well when their parents actively communicate with schools, which increasingly involves technology, such as emails, e-bulletin boards, online portals, and digital announcements, requiring computers skills. Borup et al. (2014) found that some parents lacked the computer skills needed to assist their children in virtual learning settings.

As the use of technology has become increasingly prevalent, the United States has experienced a surge in online learning, and in the absence of the physical presence of a teacher, more responsibility for teaching children is falling upon parents (Bowers & Kumar, 2017). Research indicates that Web 2.0 technologies provide parents with access to their children's work (Shin & Seger, 2016). However, parents often lack the needed computer literacy skills. Because many schools communicate with families through technology necessary for parents to be involved with their children's learning, the retrieval of these school messages requires literacy skills that some parents do not have (Machado-Casas et al., 2014). Although these studies show the importance of parental

involvement in virtual learning, researchers have not examined the extent to which parents' computer literacy moderates the relationship between parental involvement and student outcomes. Parental involvement in virtual learning settings may not yield optimal outcomes if parents do not possess the computer skills needed for virtual learning. Therefore, this study was designed to examine the relationship between parental involvement, computer literacy, and students' grades at a Cyber Charter School. In this study, parents' computer literacy was measured using the Information and Communication Technology (ICT) Skills Scale developed by Wilkinson et al. (2010). The ICT Skills Scale is a self-report measure designed to assess an individual's ability to perform computer-related tasks that are fundamental to virtual learning (Wilkinson et al., 2010).

Purpose of the Study

The purpose of this quantitative correlational study was to examine whether computer literacy moderates the relationship between parental involvement and student outcomes. Specifically, I measured parental involvement, the independent variable, using Eng's (2013) Parent Academic Involvement Scale (PAIS). I also measured computer literacy, the moderating variable, using the ITC Skills Scale (Wilkinson et al., 2010), and student outcomes (students' grades in their virtual learning courses) as the dependent variable.

Research Question and Hypothesis

The following research question guided this study.

RQ: Does parental computer literacy needed for virtual learning (as measured by the ICT Skills Scale; Wilkinson et al., 2010) moderate the relationship between parental involvement (as measured by the PAIS; Eng, 2013) and students' grades in virtual learning courses?

H_O: Parental computer literacy does not moderate the relationship between parental involvement and student grades in virtual learning courses.

H_1: Parental computer literacy does moderate the relationship between parental involvement and student grades in virtual learning courses.

Theoretical and Conceptual Framework

The theoretical framework I used to guide my research was based on the ecological systems theory proposed by Bronfenbrenner (1977). This theory provides a framework for understanding human development based on three core propositions: (a) development occurs through interactions between individuals and their environments, (b) the immediate environment can be distinguished from wider environment levels, and (c) interrelationships between the different levels are influential. Ecological systems theory holds that the ecology of human development can be studied by examining the interactions between people and the changing properties of their immediate settings. The microsystem, which includes an individual's immediate surroundings, such as family and peers, significantly influences the individual (Bronfenbrenner, 1977).

With students in a virtual learning setting, their parents represent a major component of their microsystem that influences their learning. The hypothesis derived from ecological systems theory is that parents, their knowledge of technology, and their

children's learning outcomes are related. I therefore used Bronfenbrenner's (1977) ecological theory to understand how parents as a key component of students' microsystems affect students' learning outcomes.

Nature of the Study

The nature of this study is quantitative. I have chosen to use a quantitative method because the variables under investigation in this study are quantifiable using validated instruments (i.e., computer literacy) or are directly quantitatively measured (i.e., parental involvement and students' grades in their virtual learning courses). The specific research design is a survey. Survey design is appropriate when the researcher aims at examining relationships between variables and the study variables cannot be easily manipulated or controlled by the researcher. This research was designed to determine if a relationship exists between parental involvement and computer literacy and students' grades in virtual learning courses. Furthermore, I did not experimentally control or manipulate levels of parental involvement and computer literacy. Therefore, survey design was appropriate.

The participants were parents of high school students who were currently enrolled in a Cyber Charter School. I used Survey Monkey to collect data to measure all variables. The independent variable was parental involvement, and the moderator variable was the parent's computer literacy. The dependent variable was students' grades in virtual learning courses. Parents provided their students' current grades in virtual learning courses.

I measured parental involvement using the PAIS created by Eng (2013) and computer literacy using the ICT Skills Scale (Wilkinson et al., 2010). The ICT Skills

Scale allowed me to assess the computer skills needed for virtual learning through respondents' self-report of their ability to perform computer-related tasks. Eng created a parental involvement measure applicable to virtual learning. The PAIS measured the extent that the parent was involved in and provided support for their child's academic activities in the home environment.

Definitions

For a better understanding of this study, the following terms are defined in the context of this research

Computer literacy: Based on the Digital Literacy Scale, this refers to communication skills (the ability to communicate through digital technologies) and technological skills (the ability to find and use information in the digital environment) (Rodriguez-de-Dios et al., 2018).

Educational technology: It is the process by which technical and innovational methods and strategies are being used in imparting knowledge to the students.

Parental involvement: This comprises three primary responsibilities in an online environment: nurturing, monitoring, and motivating (Borup, 2016).

Virtual learning: It refers to computer-based systems that deliver learning materials and instruction via the Internet, a concept also known as online education (Bouchard, 2019).

Assumptions

I assumed that all parents are familiar with the methods and learning platform used by virtual schools. The questionnaire used words that were simple and easily

understood by all. It was assumed that parents selected for this study had basic computer knowledge and could complete the online questionnaire. I accepted the survey responses as being accurate from the perspective of the parents involved in the study

Some of the respondents may not have given responses according to what they feel and thus I had to accept responses received as true and accurate.

Scope and Delimitations

The study was limited in scope because the sample was from parents in SurveyMonkey's participant pool and only addressed the issue of parental involvement and computer literacy and not other academic and nonacademic issues that may have affected student outcomes. Due to restraints of time, resources, and availability of accessing schools, this study has excluded the larger population. Due to these delimitations, the external validity of the study may have been limited. The results of this study may not generalize to parents of children taking any virtual learning classes, as participants were limited to those parents of students who chose to enroll their students in Cyber Charter Schools and these parents may differ. Also, the results may not generalize to other academic outcomes.

Limitations

Since this study is designed to collect quantitative data for statistical analysis, the study was limited (acceptably) in that it did not provide in-depth insight into the topic that qualitative data would. Also, surveys that are distributed with time constraints were noted by Delva et al. (2015) as problematic in that people who struggle with real or perceived time constraints are less likely to respond to surveys because these possible

respondents feel they just do not have the time to complete the survey. Surveys often also suffer the limitation of forcing respondents into particular response categories, thereby limiting the range of responses.

Significance

For this study, I aimed at deciphering how the level of computer literacy in a parent affected the way their student performed in a virtual learning environment. The findings of this study could be used to revise existing policies as well as place emphasis on the need for programs for parents to become well-versed with the learning platform of their students. Family literacy programs are unique in their influence for positive change within families. Quality family literacy programs support parents as they are transformed into self-confident, out-spoken advocates for themselves and their children. As parents feel more confident of their own academic abilities, they are more able to become strong advocated for their children's educational experiences. As parents increase their own skills and skills at supporting their children, the whole family becomes stronger and more capable, oftentimes lifting itself out of a long, intergenerational cycle of poverty and little opportunity. Hence, such programs will also help to build literacy skills, cognitive abilities, self-esteem as well as parenting skills and family relationships. When parents and children can connect with a computer and proper computer literacy, there will be limitless possibilities for learning and growth. The positive social change as a result of the study could contribute towards greater parental support and student outcome. The results of the study can be of great benefit to teachers as well as they will be able to provide targeted support to students and parents instead of blanket directions to all.

Summary

Parental involvement in the educational processes of their children is an important factor in ensuring positive academic outcomes and positive youth development. K-12 online learning began over 20 years ago and has expanded rapidly during the last decade. The majority of enrollments are from high school students supplementing their face-to-face courses with one or two online courses. Studies have shown that many parents of virtual students do not fully comprehend their roles as learning coaches. Positive outcomes associated with high parental involvement include reduced drop-out rates, increased GPA, and enhanced mental health-related directly and indirectly to emotional and behavioral engagement (Wang & Sheikh-Khalil, 2013). The purpose of this quantitative correlational study is to examine whether computer literacy moderates the relationship between parental involvement and student outcomes among those attending Cyber Charter Schools.

Chapter 2: Literature Review

Introduction

The use of technological devices has become prevalent in most institutions and households. Digital initiatives to integrate technology in schools are increasing as companies like Google and Apple continue to offer grants for districtwide technological adoptions (Cavanagh, 2017). Hence, the need for computer literacy has taken precedence not just among the student population but also amongst adults. Students are also finding it more convenient to enroll in cyber schools, as this gives them the flexibility to work or be involved with extra-curricular activities such as sports. This is especially true with high school students. Research on school effectiveness, whether brick-and-mortar or virtual settings, offers many strategies for student academic improvement, one of which is parental involvement. Borup (2013) wrote about a connection between poor course test scores and parents who underestimated their children's academic needs or failed to provide adequate support. On the other hand, promoting parents' direct involvement in their children's schoolwork resulted in higher academic achievement, especially in math and science (Borup, 2015). Although much research has been conducted on the student-parent connection, there seems to be very little on how parents can be properly integrated into the virtual learning process. Parents more often than not find themselves unprepared to support their children in a virtual setting simply because they lack the technological skill necessary to do so. Parents therefore tend to back away from supporting their children, resulting in their students not achieving their academic potential. The remainder of this chapter will contain the literature search strategy, theoretical foundation, a

literature review related to key variables, and a summary. In this study, I sought to answer the research question: Does computer literacy needed for virtual learning moderate the relationship between parental involvement and students' grades in virtual learning courses?

Literature Search Strategy

I conducted comprehensive online search using Walden library's online portal. Databases and search tools used to locate relevant literature included Academic Search Complete, Academic Search Premier, EBSCO, ERIC, Education Research Complete, Google Scholar, ProQuest, and SAGE. Search terms included *computer literacy*, *computer knowledge*, *high school*, *parents*, *parental involvement*, *parental interaction*, *online learning*, *virtual learning*, and *students*. Preference was given to peer-reviewed articles published within 5 years of the anticipated year of graduation. When referencing theory, it was at times necessary to reference material that was published before the 5-year window.

Theoretical Framework

The theoretical framework I used to guide my research was based on the ecological systems theory proposed by Bronfenbrenner (1977). His theory provides a framework for understanding human development based on three core propositions: a) that development occurs through interactions between individuals and their environments, b) that the immediate environment can be distinguished from wider environment levels, and c) that interrelationships between the different levels are influential. Ecological systems theory holds that the ecology of human development can

be studied by examining the interactions between people and the changing properties of their immediate settings (Bronfenbrenner, 1977). The microsystem, which includes an individual's immediate surrounding such as family and peers, greatly influences the individual (Bronfenbrenner, 1977).

Jonsdottir (2015) conducted a study in which the student was the center of the Bronfenbrenner (1977) model to understand how systems interact and affect each other, as well as the student's development and education. In order to answer her research question: "What do teenagers prefer in parents' participation and could their wishes affect the cooperation?" she asserted that Bronfenbrenner's theory works as an analytical tool to emphasize the student's role and central placement when exploring the home-school relationship from a systemic perspective. The outcome variable of her study was "teenagers' wishes for parent participation."

With students in a virtual learning setting, their parents represent a major component of their microsystem that can influence their learning. The hypothesis derived from ecological systems theory is that parents, their knowledge of technology, their home-based involvement, and their children's learning outcomes are related. I therefore used Bronfenbrenner's (1977) ecological theory to understand how parents as a key component of students' microsystems affect students' learning outcomes.

Literature Review Related to Key Variables and Concepts

Virtual Learning

Advancements in communication technology have provided many exciting opportunities for schooling over the past 2 decades (Gulosino & Miron, 2017). Cyber and

online schools, also known as virtual schools, deliver their instruction and all curriculum via the internet, where students are usually participating from home and teachers are at a designated remote location. This allows for flexible participation (Gulosino & Miron, 2017). In a democratic society such as ours, education has placed high value on traditional education with a common schooling experience, peer interaction from broad and diverse backgrounds as well as daily peer interaction. On the other hand, the logic of school choice provides new education pathways that serve students with different needs. Online access to the curriculum and instruction offers students flexibility and a range of available options to accommodate different learning styles. Another benefit of cyber schools is the ability to serve a wide range of students such as those with limited English proficiency, English language learners (ELL), students with disabilities, gifted and talented students, as well as those that are socially disadvantaged (Borup & Stevens, 2017). The performance and characteristic of these schools is especially important as they receive full funding for delivering a complete education experience per educational standards. School performance measures for virtual schools indicate that they are performing poorly, however their enrollment growth has continued (Gulosino & Miron, 2017). Full time virtual schools enrolled 297,712 students between 2017-18 (Miron & Elgeberi, 2019), showing enrollments in virtual schools increased by more than 2000 students between 2016-17 and 2017-18. Although private (for profit and non-profit) EMOs operated on 34% of full-time virtual schools, those schools enrolled 64.4% of all virtual school students. Gulosino and Miron (2017) conducted studies to see how virtual schools placed with their high school graduation rates. Information on these was

available for 131 virtual schools (about 28% of the total 457). Others were not in a

position to offer statistics, as they were fairly new or did not have the cohort to get rates

from. The data collected showed that on-time graduation rates for full time virtual

schools (40.6%) was less than the national average of 81%. These findings align with

other measures of school performance that add to the overall statistic of virtual school

graduation rates. Despite their below average performance outcome, the average size of

the school continues to increase, resulting in net increases in enrollment in virtual schools

(Miron & Elgeberi, 2018). There were 233 virtual charter school in the 2017-18 school

year. These school have experienced a growth on an average of 1,011 students per virtual

school.

K12 Inc is currently the largest EMO. In the year 2017-18, it operated a total of

73 full time virtual schools with a total of 88,329 students. Connections Academy, the

second largest for-profit EMO, operated 36 virtual schools with a total of 55,701

students (Miron & Elgeberi, 2018). With the consistent rise in numbers within virtual

high school settings, researchers have concluded that certain sanctions should be enforced

to bring performance standards up (Gulosino & Miron, 2017). Some recommendations

were to slow or stop the growth until the reasons for their poor performance has been

identified, reduce student to teacher ratio, enforce sanctions for virtual schools that

perform poorly, as well as sponsor research. However, there has not been a

recommendation for providing parents with the tools and training they need to become

efficient and knowledgeable learning coaches.

Virtual Learning Among High School Students

Prior research on parents' survey and interviews show that parents are attracted to virtual schools primarily because of the notion of flexibility in time, space, or place as compared to traditional brick-and-mortar schools. Unlike parents with children in brick-and-mortar school settings, parents leaning toward online classes may value other aspects of virtual schools more highly than school performance on standardized tests, such as pedagogical preferences, more flexible instructional time, more discipline, more specialized educational programs and other personal interests or needs. Parents are particularly lured to the freedom of home-schooling that offers some of the benefits of public schools especially since most high schoolers like to/have to maintain some kind of a job while in school. This is especially true for students in their junior and senior years. Another reason for the attraction to online learning is credit recovery (CR). CR or a repeat enrollment in a course in which a student has previously attempted and failed is a frequent reason why students enroll in online courses (Borup et al., 2018). However, the number of non-credit recovery (NCR) students is also increasing, and their reasons can be either elective or required. Elective reasons include flexibility, accessing courses not available that their local school, accelerated learning opportunities, conflict avoidance, homeschooling, and recovering missed credits due to extra-curricular activities or avocations.

Efficacy of Virtual Learning and Virtual Simulations

According to Gulosino and Miron (2017), one of the questions that has occurred over and over again concerns the academic success of virtual learners compared to their

traditional school counterparts. Unfortunately, this comparison is not as simple as it sounds since students do not choose to attend these schools randomly and are thus likely to differ in unobserved ways from otherwise similar students that choose to remain in brick-and mortar public schools. Hence, drawing a simple comparison of test score levels or advantages of virtual students to those of traditional brick-and-mortar public school students is likely to provide biased estimates of their academic achievement. Data visualization and exploratory data analysis provide evidence that students are learning significantly less on average in math and reading achievement in a full-time online environment that the national average for all public schools (Gulisino & Miron, 2017). On the other hand, virtual learning simulations are increasingly being used in different academic and training programs as a supplement to traditional hands on programs (Thisgaard & Makransky, 2017). These are the use of 3D objects and environments to create immersive and engaging learning experiences. The principle of virtual reality e-learning is to impart, practice, and check a user's knowledge using interactive scenarios and environments to reflect real-life situations. Virtual learning simulations provide cost-effective access to such training equipment and tools beyond what many teaching institutions would be able to provide because of financial restraints. Also, simulations make it possible for students to work with realistic scenarios that are often not possible because their occurrence in real life situations are rare or may be too dangerous (Thisgaard & Makransky, 2017).

A critical review of the literature showed that virtual learning simulations increased subject knowledge significantly. In relation to the development of STEM

interest, the social cognitive theory predicts that students will develop and interest in STEM related subjects and careers if they have high self-efficacy and positive expectations about them. Virtual learning simulations could serve as the learning experience from which students can judge their self-efficacy and come up with their own outcome expectations. Hence, virtual learning simulations may constitute a new tool for helping students decipher their own potential in STEM courses

Thisgaard and Makransky (2017) aimed at deciphering if students who use a virtual learning simulation have comparable learning outcomes to students receiving traditional lessons in the same subject. Their second research question asked if students who use virtual learning simulations have comparable non-cognitive (self-efficacy and intrinsic motivation) and career related outcomes to students receiving a traditional lesson in the same subject. For their experiment, they took a sample of 128 students from four different high schools in Denmark with an average age of 18.2 years. The participants were grouped as whole classes and each class was assigned either group A or group B. During Step 1 of the trial, Group A (66 participants) used the virtual learning simulation and Group B (62 participants) received a traditional lesson in the same subject. After an hour of instruction, the groups switched. Preceding the teacher's preparation for conducting the lesson, each teacher was given access to virtual learning simulation and were given the questions that were used to assess student-learning outcomes. All questionnaires were set up using survey monkey. The constructs the students were addressed on were learning (knowledge about evolution), self-efficacy, intrinsic motivation, outcome expectations, and interest. The results of the study showed that VLS

are superior in promoting learning and are superior in promoting non-cognitive and career-related outcomes (Thisgaard & Makransky, 2017). These results show the potential of virtual students benefiting from VLS; however, in cases where parents are not able to be supportive of this kind of learning due to their lack of digital literacy, the student may not benefit from it.

Reasons for Virtual Schooling

As research has shown, there are various reasons why parents and students lean towards virtual schooling on a partial or full-time basis. In line with any maximizer of school choice, the demand for virtual schools depends on parental preferences and values about education. Advocates have argued that providing families with greater choice of schools with more operational flexibility will bring about better matches between educational needs and school services while at the same time promoting healthy competition for the enrollment (and per pupil funding) of students (Borup, 2016). With heterogeneous preferences across households, virtual schools try to differentiate what they offer in order to create a niche in their local school district in an attempt to attract students. The market orientation of virtual schools is based on a business orientation to education where efficiency gains are seen in the private management of online education options which also appeals to parents. Because state school funding is proportional to student enrollment, the drive to grow enrollment is in turn a greater incentive to bring about parental satisfaction by operating efficiently and thereby improving outcomes that are of value both to students and parents (Borup & Stevens, 2016).

Parental Engagement

Interactions within any learning community are important for learning success and research on such structured communities that support high school learners have shown this to be true (Borup et al., 2018). Researchers, educators, school administrators, and parents have come up with several definitions for the term *parental involvement*. Accordingly, it can be said that parental involvement is the relationship that is encouraged and developed between parents, families, and schools where the common goal is to enhance student learning (Alcena, 2015). Hence, parent involvement refers to parents' role in educating and teaching their children at home and in school. This involvement can occur in many forms including help with homework, discussions about school, as well as visiting the school to talk to teachers (Al-Alwan, 2015). Parental involvement in student homework has recently received much attention as researchers attempt to better clarify how home-based involvement contributes to student learning and achievement. Studies have shown that parental involvement, school engagement, and academic performance are positively related (Gonida & Cortina, 2014). Parental involvement enhances a student's feeling of academic self-efficacy and self-esteem. When students receive consistent academic support from parents, they performed well at school, not just academically but socially as well (Al-Alwan, 2015).

Communication

Parent involvement in their student's school work facilitates parent-teacher communication. In order for students to do well it is imperative that there should be a proper flow of communication between parents, teachers and students. While in class students are expected to follow rules, participate in class activities and discussions as well

as work well with other students. Research shows that when parents involve in school activities, their children are less inclined to exhibit disruptive behaviors, are consistent with their attendance at school and are confident. Gonida and Cortina (2015), talked about the different types of parental engagement while assisting their children with their homework. In a study conducted at a Greek school, four different types of instruction-related strategies were discussed: autonomy support and promotion of self-regulation, control, interference and cognitive engagement related to homework. These types of parental engagements were triggered by different factors such as achievement goals, efficacy beliefs, and achievement. Autonomy support as a way of parent-child engagement aims toward skill acquisition that master-oriented parents encourage. On the other hand, parental interference and control are less likely to occur when parents hold positive academic efficacy beliefs for their child, thus encouraging cognitive engagement during homework time showing high efficacy beliefs to their students. However, it has been reported that parents of immigrant students such as English Language Learners (ELLs) are less likely to participate in their children's schooling not because of negligence but mostly because of a lack of formal education, and low English proficiency. When parents take the time to praise the efforts of their children as well as contribute their time to community building within the school they are directly influencing their students' perception of self thereby nurturing their student level of school engagement. Once again this is a direct influence of the level of communication that exists between student and parent. When students can communicate freely with parents about their successes as well as struggles at school they find themselves better

able to deal positively with issues that arise at school whether they be academic or social. Furthermore, parental involvement and school engagement as a solution for these challenges generates more positive and spontaneous reciprocal form teachers, which again enhances student performance.

Engagement in school activities is considered an important outcome of motivation (Al Alwan, 2015). School engagement is a multidimensional construct that has three components: behavior, cognition and emotion. Behavioral engagement refers to the actions and practices that students involve in at school. It includes active participation and positive conduct. Emotional engagement refers to feeling, interests and attitudes that students have towards learning in general and the school atmosphere. Cognitive engagement refers to the quality of cognitive processes and learning approaches that students employ on school assignments such as goal setting, self-regulation, intrinsic-motivation and the use of learning strategies. Ultimately, the degree to which students engage in school behaviorally, emotionally and cognitively will influence their academic success which in turn may influence changes in all three aspects of school engagement (Al Alwan, 2015). In order for parental involvement to occur and be effective in a virtual setting, virtual schools must provide parents with the tools needed to play their part in their childrens' education.

On the other hand, parental interference and control are less likely to occur when parents hold positive academic efficacy beliefs for their child, thus encouraging cognitive engagement during homework time showing high efficacy beliefs to their students.

Parental Involvement in Virtual Learning

Parental involvement in their children's virtual learning can lead to increased student success. Research has shown that a school's frequent communication and interaction with parents are the strongest premise for school practices of parental involvement to support children's learning at home and at school (Gu, 2017). To stress the importance of parental involvement on students' virtual learning, Alcena (2016) noted the number of courses offered virtually to compare it with the number of students attending school virtually in Florida, suggesting a consistent increase in number of virtual students alongside an increase in the number of courses offered and staff members provided. As technology-based instruction has escalated, so has virtual schooling. Borup, Graham, and Davies (2013) also examined parental interaction in an online setting by conducting a quantitative study using surveys, which were designed to measure the time that parents spent helping their high school students (9th – 12th grades) with their schoolwork. Student surveys measured student perceived learning and course satisfaction, while parents' surveys measured parent satisfaction with courses and their perceptions of student course interaction. In planning for a future in virtual education, it has become imperative to include parents and families in the education of their children (Alcena, 2016).

Parental Electronic Involvement

Cavanaugh, Barbour, and Clark (2009) added that K-12 students tend to have an external locus of control with fewer metacognitive skills. Thus, most of them require adult supervision to encourage and monitor their learning. Wang and Xing's (2018) study

also emphasized parental involvement. The researchers examined the direct effects of parental involvement on teen digital citizenship, which includes digital etiquette, digital access, and digital safety. According to Ribble (2009), parents are the child's first and most influential teachers of civic values and attitudes, hence parents need to be involved in the process of raising their children to be good digital citizens. Bartau-Rojas, Aierbe-Banrandianran, and Oregui-Gonzalez (2018) examined the beliefs and daily practices of parents in promoting responsible use of the internet by their children. Bartau-Rojas sought to identify parents' mediation strategies and identify the needs of parents in their mediation, as well as draw practical conclusions for educational interventions aimed at helping families.

The results of Borup et al.'s (2013) study showed that students spent 40% more time interacting with parents regarding schoolwork than they did with their peers. It also showed that they spent 300% more time with their parents than with their instructors (Borup et al.,2013). Data showed that the motivational value of learner-parent interactions reported by students was significantly higher than learner-content, learner-learner, and parent-instructor interactions. As K-12 online enrollment increases, it is becoming evident that parents need to assume more responsibility for their childrens' learning.

Parents as Mentors

Virtual schools expect parents to assume some teacher responsibilities especially through mentoring students and providing instruction. As a result of the limited interactions between online teachers and students, parents are required to interact

frequently with their students to effectively fulfill their co-educator duties (Borup, 2018).

At the same time he cautioned that parents typically lack the content expertise needed to

directly instruct students especially in high school. Parents are encouraged to be mindful

of the benefits and drawbacks of parental instructional support so they learn to fulfill their

roles in ways that facilitate and not inhibit their student's learning. In order to investigate

parental engagement behaviors in an online setting, Borup and Stevens (2015) conducted

a descriptive qualitative study. Data was collected from one high school in Montana.

Participant sampling was based on teacher recommendations and each student was

assigned a shepherd who regularly communicated with students and parents to provide

general support and act as a liaison to parents. Five shepherds were asked to use their

understanding to recommend two of their students for interviews. For a total of 10

students, Borup and Stevens (2015) invited students to participate in an hour-long

interview. Analysis of these interviews resulted in the identification of four primary types

of parental engagement, including nurturing relationships and interaction, advising and

mentoring, monitoring and motivating, and organizing and instructing (Borup & Stevens,

2015). To nurture close relationships, parents listened to their students to understand their

academic and personal needs as well as respond appropriately to those needs. Parents also

engaged in advising and mentoring their students on issues beyond their courses, such as

life decisions that would positively impact their lives. Many parents found it necessary to

monitor and motivate their students' behaviors and performance because even the most

independent student felt the need to be supported by their parents. Parents also assisted in

organizing their students' space and time and assisted them in direct course instruction in

the absence of their course teachers (Borup & Stevens, 2015). In their research, Oviatt, Graham, Davies & Borup (2018) drew attention to the ACE (Adolescent Community Engagement) framework which identifies specific roles that are fulfilled by student, teacher, peer learners and parents. This framework suggests that when students are engaged at a consistent level by these external figures they exhibit a greater level of engagement by the student. Research on structured communities that support adolescent learners conclude that interactions in learning communities are critical to learning successes (Oviatt et al., 2018).

The parental role of engagement in the ACE framework comprises "interaction, facilitating, instructing and organizing". As previously mentioned parents are expected to assume some teacher responsibilities in a virtual setting particularly facilitating interaction through providing instruction and interaction. However, parents are not content experts and Steven & Borup (2015) encouraged online programs to understand the benefits and drawbacks of parental instructional support and to work with parents so that they understand and fulfill their roles in way that facilitate student learning. Hasler, Waters et al., (2014) suggested that virtual schools should provide training for parents as facilitators. They also noted research does not clearly define variable associated with parental involvement and that certain studies hint at how parents might fill a gap when teachers are not present (Hasler et al., 2015).

For their experiment Hasler Waters et al., 2015, used a mixed method design combining both quantitative and qualitative data sources. The specific approach was a survey and sequential explanatory design where quantitative survey data was collected

and then follow up qualitative, semi-structured interviews were conducted. The intent of this study was to identify actual student engagement with a Private Community Environment (PCE). Results indicated that students reported receiving help from parents more than twice as frequently as they received help from teachers or peers. Parents were engaged in helping their students learn self-regulation skills especially in an online course (76%). Parents also spoke to the online school instructor on behalf of the student (71%). The results also showed students received organization ideas from parents (94%). These results align with research and provider expectations that support for students will mostly come from parents in an online setting (Oviatt et al ., 2018).

Alongside these results, Nogueron-Liu (2017) examined digital access, technology use, and belief of Spanish-dominant parents with children attending a school in the early stages of 1:1 (one lap-top, on child) and bring your own device BYOD to school. By providing devices within home-school relationships, Liu (2017) described the beliefs of these parents in response to school expectations to adopt technology to support their children's academic endeavors. Liu performed her study at Cahvis Elementary School in Alisonville, Georgia. The school had a 67% enrollment for Latin students during the 2012-2013 school year. Nogueron-Liu (2016) designed six semester long workshops (fall 2012 to summer 2014) during which time she drew on parents' requests and recommendations from family specialists and teachers. Liu (2016) focused on eight participants because their children fulfilled her criteria of attended at least one workshop, and completed at least one interview. Findings of Liu's study showed that many of the parents that arrived at Allisonville in the mid-1990s did not attend a four–year university.

Despite their lack of higher education, these parents sought to access and learn how to make the most of technology devices. To include non-dominant parents in equitable partnerships, it was necessary for these parents to develop expertise and confidence in digital literacies (Nogueron-Liu, 2017).

Access and Use

The advancement of technology has contributed to learning at home necessitating parental involvement (Suleyman et al., 2016). Although like a side effect to a good medicine, technology also produces negative results. In instances where children use technology for recreational purposes parents do become concerned and apply restrictions causing parent-child conflicts. As a result, parents may start monitoring their student's activities through filters and software and they may in some instances, restrict usage. This may become a hindrance to their child's online progress as the restriction may include sites used for educational purposes.

Nellisen and Van den Bulk (2017), conducted a study that investigated whether child parent digital media guidance is associated with media conflicts in the family. The aim of their study was to compare the reporting by students and parents about child parent digital media guidance. The research question was 'are there discrepancies in how parents and their children report child-parent digital media guidance?' A sample of 187 parent-child dyads (N= 374) filled a survey called the Family and Media (FAME) survey. This survey included socio-demographic questions of the parent and child such as gender, date of birth, ages of both child and parents as well as educational degrees. Both parents and children were also asked 'do you ever get into an argument with your

child/parent about….?' Looking at the answers the children gave regarding their influence on their parents' digital media learning, it was observed that children perceived to have most influence on their smartphone, tablet and app learning. The study also revealed child-parent digital media guidance is related to parent child media conflicts and that child-parent digital media guidance was a significant positive predictor of media conflicts in both the child and parent reports. Their study specifically examined whether parent-child digital media guidance is related to parent-child conflicts. Traditionally, children are known to internalize the norms and values of the society they live in from their parents as well as their teachers and friends. From this perspective, parents are the most important agents of socialization for their children. With the rise of digital influences this trend appears to be changing. A Study conducted by Correa (2015), found that currently children teach their parents how to use digital media such as the Internet, cell phones and computers. He called it 'the bottom-up technology transmission' where children become the 'media-brokers' of their families. Needless to say, there is a digital gap between the generation, as children not only introduce new media to their parents, but they also guide them on how to use and interact with new digital media (Correa, 2015).

In their experiment, both parents and children were asked the following question 'If you think about your children, how often do they teach you to use the following media, technologies and /or applications. If you think about your parents how often do you teach them to use the following media, technologies and /or application.' The study examined whether child-parent digital media guidance is related to parent-child media

conflicts. The regression models showed that after controlling for the same sociodemographic variables, child-parent digital media learning was a positive predictor of media conflicts between parents and their children. This indicated that when children teach their parents more about digital media, there appears to be more media conflict between parents and children. These results also show that technology has the potential to change power structures and is therefore important for parents and caretakers to be on par with the latest trends in technology, especially in a virtual school setting. Hence, educating parents about how to use technology properly to involve into the education of their children is much needed (Suleyman et al., 2016).

Alcena (2014) also supported Liu's study by suggesting that Florida Virtual School (FLVS) could provide workshops to help parents learn skills such as creating and accessing e-mail, navigating websites and learning computer programs. She reviewed data from a Florida Virtual School Legislative Report (2012). Her observations on the overall performance of virtual schools in Florida pointed towards a need for parents' involvement in virtual settings and how this could bring about better performances from both students and educators, which could result in better grades for students and increased graduation rates. Furthermore, Sanchez-Valle et al., (2017) examined how parental control style and their confidence in the online environment enable the empowerment of minors in the use of the Internet. Valcke et al., (2010) observed that the way in which children approached technology was related to their parents' use of the internet, their attitude and their experiences online. Hence, Valke et al., (2017) hypothesized that parental level of education and their activity on the internet were the

variables that would best predict how children would interact with the internet. Sanchez-Valle et al.'s (2017) sample of parents included those of various educational levels, and the type of school (public or private) their children attended was taken into consideration. Personal factors included the age of parents, their level of education, the number of children in the family unit, the age of the children, the type of home, and the parents' level of experience with the internet. Data were collected from an ad hoc online questionnaire that included items such as the ages of parents, gender, academic level attained and frequency of internet use. Overall, 765 valid questionnaires were gathered. Parents' confidence in use of the Internet was measured on a 4-point Likert-type scale from low to high. Results showed that parental use of the internet, the control of subsequent activities and time significantly predicted children's interaction with the internet (Sanchez-Valle et al., 2017).

Digital Literacy

For their study, Wang and Xing (2018) chose a sample of 270 teen participants from a large national survey study. Among the 270 teens, 54.4% were male and 45.6% were female and their ages ranged from 12 to 17 years old. Thirty-seven percent of the parent participants were male and 63% were female (Wang & Xing, 2018). Participants were given a survey questionnaire and the questions used were based on five constructs: parent socioeconomic status, parent involvement, teen digital access, digital etiquette, and digital safety. Results showed that active parental awareness of the use of technology was more effective than parents simply restricting their teenagers' use of technology.

Shin and Seger (2016) furthered this line of research and explored the benefits of parental involvement in the education of children who were English Language Learners (ELL). In Shin and Seger's study, parents used blogging to support their children's learning. The parents of three students were included in the study, all of whom were from Spanish-dominant bilingual backgrounds. The teacher created a blog using a web-browser based service. Parents were invited to review their children's work on the blog in a language that felt more comfortable to them (Shin & Seger, 2016). The results of Shin and Seger's study showed that parents, mainly mothers, made consistent, direct contact and participated in their children's schooling. Parents' blogging encouraged children to participate in schoolwork more readily, and they looked forward to getting feedback from their parents. According to Seger and Shin, the children reported that receiving comments from family members was the "best" experience they had with blogging.

Parental Computer Literacy Needed for Virtual Learning

Bronfenbrenner's (1977) microsystem involves the role that culture and the environment plays in childhood development, and parents are a major part of children's microsystems. Students continue to look for and appreciate the involvement and participation of their parents in their education, even for online learning. Bartau-Rojas et al.'s qualitative investigation involved focus group discussion to collect in-depth information on the daily practices, beliefs, and difficulties parents face when trying to teach their children about responsible internet use. For their study, 44 parents participated voluntarily and were placed into four groups. Parents were asked a series of questions related to their children's consumption of media. The results showed that parents had

very high negative concepts of use of the internet, which suggested they lacked adequate computer knowledge and therefore were not comfortable using the internet. When parents tried to teach their children, they recognized their own low level of knowledge about how to use the internet and that their children knew more than they did in this respect (Bartau-Rojas et al., 2018). Bartau-Rojas et al.'s findings supported those of Cheung (2010), who studied 2 579 families with children ranging from ages 6 to 17, and found that parents' knowledge of how to use the internet was a key factor in the supervision of their children's use of the internet. The aim of their research was to analyze parental beliefs on Internet use by students, to identify parents' mediation strategies, to recognize the difficulties parents perceive in teaching responsible us of the internet and to detect the needs of parents in their mediation so that researchers can come up with practical educational interventions aimed at helping families (Bartau-Rojas et al., 2017). This qualitative investigation used the group discussion technique to conduct an in-depth analysis of the daily practices, beliefs, and difficulties that parents face when trying to teach their children. 44 parents participated (37 women, 7men). The questions posed to the parents were, 1) what positive and negative aspects do you believe consumption of media has on your children? 2) How do you act about your children's consumption of media? 3) What do you believe are the main difficulties?

Results showed that parents had positive and negative conceptions on the use of internet, however the negative ones (70.55%) far outweighed the positive (29.45%). When asked about mediation strategies, 53.54% responded that they impose restrictions while 46.46% said their interventions were of an instructive and supportive nature.

(Bartau-Rojas et al., 2017). Parents also responded to questions about their own low level of knowledge about how to use the internet. Hence, the analysis of parents belies regarding their children' use of the internet showed that parents are more pessimistic than optimistic which confirms that internet use is an issue that concerns them. These findings point to the need to develop digital competence in parents and to recognize the specific needs of training parents in the areas of developing digital skills that will help them reinforce organization of time and space, instruct their children on risks and benefits of internet usage, strengthen parental authority and to promote collaboration between schools and families to increase their students' digital competence.

Likewise, Machado-Casas, Sanchez, and Ek (2014) investigated the digital divide amongst Latino immigrants through a qualitative study in a south Texas city that is predominantly Latino. The qualitative data was collected as part of a larger project that included digital stories (story kits), videos, pictures, narratives, surveys, field notes and interviews that focused on Latino immigrants' opinions about technology needs. Twelve women participated in the study, four of whom were born in the United States, and the remaining eight came as immigrants after the age of ten mainly from Mexico. Machado-Casas et al. (2014) found that the most prevalent types of technology used were cell phones and Nintendo dual screen devices. Nine households had either a desktop computer or laptop, and a few had both. This means 75% of the participating families had some type of computer at home (Machado-Casas et al., 2014). However, five of the families reported not having internet accessibility. Parents were also asked how well they rated themselves on their knowledge of computer use. Of the 12 women, the majority

reported "not being very knowledgeable." Through analysis of the interviews, Machado-Cassis (2014) tapped into parents' views of technology and its importance in their children's lives. Parents expressed that they value technology and that they realized the importance of it, specifically as a tool to help their children do homework and locate information. Hasler Waters et al., (2014) suggested that virtual schools should provide training and supports for parents and facilitators, instructors, motivators as well as articulate communication guidelines to support parental engagement. They also noted that research does not clearly define variables associated with parental involvement in High school online learning.

The results of Alcena (2014) and Borup's (2015) research showed a positive trend towards student interaction with parents. This trend also superseded the time they chose to spend with their course instructors. Cavanaugh et al. (2009) further observed that because of an external locus of control even the most independent students needed parental academic support. On the other hand, Liu's (2013) research showed a trend on the part of parents who lacked technological skills in seeking out ways to learn how to make the most of technological devices. Ribble's study showed that parents' involvement in raising their children to be digital citizens was also crucial as parents are children's first and most influential teachers. However, Bartau-Rojas' (2018) study showed that when parents tried to teach their children, they recognized their own lack of technological skills and were frustrated in the realization that their children were more technologically advanced than they were. Although these studies show the potential of positive parental involvement, they do not address how parental computer literacy affects students' virtual

learning. My study seeks to address this gap by asking how computer literacy moderates the relationship between parental involvement and students' grades in a virtual setting.

Summary

It is evident that the number of virtual students in high school is steadily increasing. Research also showed that students spent 300% more time interacting academically with their parents than with their instructors (Borup et al., 2013). Parents found the need to monitor and motivate their students as a form of support for their students; as a result, it became necessary for these parents to develop expertise and confidence in digital literacies. Sanchez-Valle et al. (2017) found that parental style of control of the internet, their control of subsequent activities, and time significantly predicted their children's interaction with the internet. Results also showed that active parent awareness was more effective than parents simply restricting their teens' use of technology. Hence, activities like parent blogging encouraged children to participate in schoolwork more readily (Shin & Seger, 2016).

On the other hand, parents have also reported negative attitudes toward the internet not because they did not approve of it but because they recognized their own low levels of knowledge with regards to the internet (Cheung, 2010). Cheung's (2010) study revealed that parents' knowledge of how to use the internet was a key factor in helping their children with schoolwork. While these studies show the potential of positive parental involvement, they fail to address how parental computer literacy affect their children's learning. This study addresses this gap by asking how computer literacy

moderates the relationship between parental involvement and student grades in a virtual setting.

Chapter 3: Research Method

Introduction

The purpose of this quantitative correlational study was to examine whether computer literacy moderates the relationship between parental involvement and student outcomes. Online learning appeals to a large number of high school students because it caters to the need for flexibility which is something that is lacking in a traditional school setting. Not only can students set up their own study schedules, but they are also ensured that learning resources and tools are always available. Ongoing research also shows that parental involvement in the learning process of their children improves student achievement, reduces absenteeism, and give parents a sense of confidence in their children's education. Students with involved parents or caregivers, earn higher grades, have better social skills, and show improved behavior. However, as increasing numbers of students turn to virtual learning options, parental involvement is coming to include online parent orientation, exploring the students' learning platform, and helping organize their student's virtual day, as well as assist their children with schoolwork. Therefore, parents need some degree of computer literacy (Borup & Stevens, 2015). Researchers have not examined the extent to which parents' computer literacy moderates the relationship between parental involvement and student outcomes. Parental involvement in virtual learning settings may not yield optimal outcomes if parents do not possess the computer skills needed for virtual learning. Therefore, this study was designed to examine the relationship between parental involvement, computer literacy, and students' grades in their virtual learning courses.

In this chapter, I address the research design and the rationale behind it. I discuss the methodology with respect to population, sampling and sampling procedures, and procedure for recruitment and data collection and analyses. I also include information about the instrumentation and operationalization of constructs. Finally, I address threats to validity, ethical procedures, and provided a summary.

Research Design and Rationale

I selected a quantitative correlational research methodology with a moderation design to determine if parents' computer literacy moderates the relationship between parental involvement and student grades in virtual learning courses. The independent variable for this research study was parental involvement. The dependent variable was student grades in virtual learning courses. The moderating variable was parents' computer literacy A correlational moderation study established the extent to which two factors were related and the extent to which this relationship may change depending on the levels of a moderating variable. Quantitative research methods are generally used to test numerical data for finding correlation between variables so that the findings can be generalized to the population. This research design used non-experimental study to assess relationships without manipulating the variables. A multiple linear regression analysis was used to determine if there was a statistically significant moderating effect of computer literacy on the relationship between parental involvement and student grades in virtual learning courses.

Methodology

Population

The population of interest in this study included parents of students who went to school virtually. Cyber charter schools are a popular school choice enrolling over 250,000 students across the United States. The target population were parents of full-time cyber charter high school students. The reason I used cyber charter schools was because parents/guardians of a public cyber charter school student serve as the learning coaches working closely with their child and their child's teachers. Hence, this group of parents served as my target population to address my research question. Students of all ethnicities, cultures, and religious affiliations attend cyber charter schools. Between fall 2000 and fall 2017, public charter schools experienced changes in their demographic composition similar to those seen in public schools. The percentage of public charter school students who were Hispanic increased (from 19 to 33%), as did the percentage who were Asian/Pacific Islander5 (from 3 to 4%). In contrast, the percentage of public charter school students who were White decreased (from 43 to 32%), as did the percentages who were Black (from 33 to 26%) and American Indian/Alaska Native (from 2 to 1%). Beginning in fall 2009, data were collected on students of two or more races attending public charter schools; students of two or more races accounted for 4% of public charter school students in fall 2017 (National Center for Education Statistics, 2018). Public charter schools serve K-12th grades; hence, their student population ranges from 5 – 18 years. The population I targeted were parents of high school students (9th –

12th grades). Many of these students chose to study virtually because of flexibility, mobility, customization, and social reasons such as bullying.

Sampling and Sampling Procedures

I used the convenience sampling method to select my group of participants from SurveyMonkey's participant pool as it was easily accessible to me. SurveyMonkey audience comprises a global panel that is ready to answer questions or surveys. Using the targeting options available in the Target Audience Collector, I was able to send my survey to my specific audience namely parents of cyber charter high school students. Purposive sampling is a non-probability sampling technique where subjects are selected with a specific criteria in mind. To be included in the study, participants were required be the primary caretaker of the student. Participants were excluded if they were parents of students who were still in the enrollment process or parents of students who were truant or were excused from school due to illness or extenuating circumstances.

Sample Size Analysis

A power analysis was conducted using G*Power to determine the appropriate sample size for the proposed analysis. The calculation was based on a linear regression (R^2 increase) with three total predictors (computer literacy, parent academic involvement, and computer literacy x parent academic involvement), one tested predictor (computer literacy x parent academic involvement), a medium effect size ($f^2 = 0.15$), a power level of .80, and a significance level of .05. The results of this power calculation revealed that the minimum sample size needed for the analysis is 55.

Procedures for Recruitment, Participation, and Data Collection

All recruitment and data collection procedures were reviewed and approved by the university's Institutional Review Board (IRB) before any data were collected. The informed consent form and all survey questions were imported into SurveyMonkey's survey creation software to create the online survey. After the online survey was created, the data collection occurred through SurveyMonkey's participant recruitment services. I provided SurveyMonkey with the study inclusion and exclusion criteria, and SurveyMonkey emailed eligible parents in their participant pool a link to access the survey. The consent form (See Appendix A) was included in the first page of the SurveyMonkey survey. The consent form included an introduction to my research study and assured participants of confidentiality on information they provide in the survey. Upon opening the survey, the participants first had to read and sign the consent form before accessing the survey questions. The consent form included a question asking the parent if the child attends school regularly. If the parent answered 'no,' the survey was withdrawn and a message of thanks was conveyed.

After agreeing to the consent form, participants were presented with the study instruments, including the ICT Skills scale and PAIS. A demographics questionnaire (See Appendix B) also contained a question asking parents to report their children's GPA score of the most recent completed quarter. GPA is the average of students' grades in the core academic subjects (English, math, science, and social sciences). Academic achievement for the last quarter of the student's GPA was obtained for the study. After

completing all survey questions, the participants received a message thanking them for their participation.

Instrumentation and Operationalization of Constructs

ICT Skills Scale

Parental computer literacy was measured using the ICT Skills scale developed by Wilkinson et al. (2010; See Appendix B). The measure was designed to assess respondents' self-reported confidence and ability in performing basic computer and information search functions required for e-learning. The instrument consists of 10 items that respondents rate using a 5-point Likert scale with anchor points labeled "strongly agree" and "strongly disagree." Example items include "I can use a word processing application" and "I do not know how to find an article in an e-journal." Wilkinson et al. established the validity of the instrument through a series of studies, including an initial review of the item pool by an expert panel and several subsequent tests of the instrument on samples of students to further refine the items. First, Wilkinson et al. created an item pool and had 16 expert panelists (including learning technologists and educational researchers) review and refine the items for content and face validity. Next, Wilkinson et al. pilot tested the instrument on 60 graduate nursing students, resulting in modifications to the items. The refined items were then tested on two additional samples of students (with sample sizes of 70 and 458 respectively). Interitem reliability across these samples of students ranged from .75 to .81 (Wilkinson et al., 2010). In my study, the responses to the items were averaged to create an interval-level composite score representing parental computer literacy.

Parent Academic Involvement Scale

Parental involvement was measured using the PAIS developed by Eng (2013) (See Appendix B). The PAIS consists of 25 items which were originally designed to measure the extent that the parent is involved in the home environment. Example items include "I talk to my child about how important school is" and "I review my child's school work on a regular basis." Respondents rate each item on a Likert scale ranging from 1 (*rarely*) to 4 (*always*). Eng developed the instrument based on the parent academic involvement literature (McWayne et al., 2004) and an expert panel of psychology professors. Evidence for construct validity was established through significant correlations with parents' academic aspirations for their children ($r = .26$) and fatalistic beliefs about their childens' academic success ($r = -.20$). The interitem reliability of the scale was .82 (Eng, 2013). In this study, the responses to the items for the scale were averaged to create an interval-level composite score representing parent academic involvement.

Data Analysis Plan

The parent survey data were compiled into an electronic spreadsheet and imported into SPSS for data analysis. Missing data were examined, and the data were checked for accuracy. Any case with missing data was excluded from the analysis. Frequencies were examined to ensure that all values in the data set fell within the possible range of values for each variable. Descriptive statistics (i.e., means and standard deviations) were computed and reported for each of the variables of interest. The following research question and hypotheses were address in the data analysis:

RQ: Does parental computer literacy needed for virtual learning (as measured by the ICT Skills Scale; Wilkinson et al., 2010) moderate the relationship between parental involvement (as measured by the PAIS; Eng, 2013) and students' grades in virtual learning courses?

H_O : Parental computer literacy does not moderate the relationship between parental involvement and student grades in virtual learning courses.

H_1 : Parental computer literacy does moderate the relationship between parental involvement and student grades in virtual learning courses.

A moderated multiple regression analysis was conducted to address the research question and hypotheses. A moderation analysis using multiple regression is appropriate to conduct when the research aims involve determining if the relationship between two variables is moderated by a third variable (Baron & Kenny, 1986). In this analysis, the independent variable was parental involvement, as operationalized by the composite score for the PAIS. The dependent variable was student grades in virtual learning courses. The moderator variable was parental computer literacy, as operationalized by the composite score for the ICT Skills Scale. The independent variable and moderator variable were mean-centered for the regression analysis to reduce potential multicollinearity. The regression analysis was conducted in two steps. In the first step, the independent variable (parental involvement) and moderator variable (parental computer literacy) were entered into the regression predicting student grades. In the second step, the interaction term for parental involvement x computer literacy were entered into the model. If the addition of the interaction term significantly increases the variance

explained by the regression (as evidenced by a change in R^2 that is significant at an alpha level of .05), then moderation is supported and the null hypothesis may be rejected (Baron & Kenny, 1986).

The assumptions of multiple regression analysis were evaluated prior to the analysis. First, the assumption of normality was evaluated using a Q-Q scatterplot of residuals (Field, 2013). Homoscedasticity was evaluated by inspecting a scatterplot of residuals versus predicted values (Field, 2013). Multicollinearity was evaluated by calculating variance inflation factors (Field, 2013). Finally, outliers were assessed by calculation of studentized residuals (Field, 2013).

Threats to Validity

A possible threat to internal validity in this study was social desirability bias in the participants' survey responses (e.g., parents may report higher levels of involvement to cast themselves in a more positive light). As a result, some of the respondents may not have given responses according to what they actually felt, and thus, I had to accept responses received as true and accurate. Another threat to internal validity was the possibility that parents' reports of their children's GPA may have been less accurate than if GPAs were obtained directly from the children's school records.

A threat to external validity in this study was the use of convenience sampling; because the participants were recruited from SurveyMonkey's participant pool, the sample may not have been representative of the general population of parents of students who went to school virtually. It was desirable to include all parents of virtual schools in the country, but it was impossible for practical purposes. Therefore, the study was limited

to SurveyMonkey's participant pool. Survey monkey audience comprises a global panel that is ready to answer questions or surveys depending on the nature of the questions. Using the targeting options available in the Target Audience collector, I was able to send my survey to my specific audience namely parents of cyber charter high school students. Selection bias was another possible threat to external validity in this study, as parents who chose to take the survey may have differed systematically from parents who chose not to participate.

In order to address these potential threats, participants were assured that their responses will be anonymous. The participants received a link that when opened gave them the option to answer questions without their identity being compromised. This made participants at ease to answer questions honestly and without hesitation.

Ethical Procedures

All data collection procedures were reviewed and approved by the university IRB before any data was collected. To ensure necessary ethical procedures were followed, all participants had to undergo the informed consent process so that they were aware of their rights as well as their roles as respondents to the study. This was obtained prior to data collection and participants had the opportunity to withdraw or end participation at any time during the study. Participants were also informed of the purpose of the study as well as the types of questions the survey would contain, and that if they chose to withdraw, there would be no consequences.

The identities of the participants were kept anonymous during the entire process. Identifying information was not collected for any reason. To maintain this, I

used identification numbers to represent each participant. The collected data was then stored as an excel file on a password protected computer kept in a locked storage cabinet which was only accessible to me. This data will only be stored for a period of 5 years after completion of the research. After 5 years, all data will be deleted from the password-protected computer.

Summary

This research seeks to identify the effects of parental involvement on student academic outcomes. I selected a quantitative correlational methodology since this design establishes the extent to which two factors are related, as well as the extent to which this relationship may change depending on the levels of a moderating variable. The population included parents of students who went to cyber charter high schools. I used convenience sampling to select participants from SurveyMonkey's participant pool. An online survey containing measures of computer literacy (ICT Skills scale) and parental involvement (PAIS) was administered to eligible participants. A moderated multiple regression analysis was conducted to address the research question and hypotheses. Because I used closed questioning in my survey there were limitations that I expected to encounter such as participants being uncomfortable to declare honestly their lack of computer skill. In order to address this issue, I used SurveyMonkey which ensured the confidentiality of all participants. The next chapter will lead to information on data collection, analysis of data and the process involved.

Chapter 4: Results

Introduction

The purpose of this quantitative correlational study is to examine whether computer literacy moderates the relationship between parental involvement and student outcomes. The research question and hypotheses addressed in this study are as follows:

RQ: Does parental computer literacy needed for virtual learning (as measured by the ICT Skills Scale; Wilkinson et al., 2010) moderate the relationship between parental involvement (as measured by the PAIS; Eng, 2013) and students' grades in virtual learning courses?

$H_{O:}$ Parental computer literacy does not moderate the relationship between parental involvement and student grades in virtual learning courses.

$H_{1:}$ Parental computer literacy does moderate the relationship between parental involvement and student grades in virtual learning courses.

This chapter contains the results of the data collection and analysis conducted to answer the research question. First, the details of the data collection and a description of the sample are presented. Next, the results of the analysis conducted to answer the research question are presented. Finally, this chapter concludes with a summary of the findings.

Data Collection

Data were collected through SurveyMonkey Audience services in October 2021. The survey received 137 responses. The sample characteristics are displayed in Table 1. The majority of participants were women ($n = 86$, 62.8%), and the largest proportion of

participants were between 30 to 44 years of age ($n = 55$, 40.1%). The largest proportion

of participants were in the $50,000 to $74,999 income bracket ($n = 35$, 25.5%), and

region of the United States with the largest representation in the sample was the South

Atlantic region ($n = 28$, 20.4%). Most participants indicated that their child's GPA was

between 3.00 and 3.99 ($n = 90$, 65.7%).

Table 1

Sample Characteristics

Variable	Frequency	Percent
Gender		
Female	86	62.8
Male	51	37.2
Age		
18-29	18	13.1
30-44	55	40.1
45-60	53	38.7
Older than 60	11	8.0
Income		
$0-$9,999	8	5.8
$10,000-$24,999	9	6.6
$25,000-$49,999	27	19.7
$50,000-$74,999	35	25.5

$75,000-$99,999	19	13.9
$100,000-$124,999	16	11.7
$125,000-$149,999	4	2.9
$150,000-$174,999	3	2.2
$175,000-$199,999	4	2.9
$200,000+	5	3.6
Prefer not to answer	7	5.1
Region		
East North Central	21	15.3
East South Central	4	2.9
Middle Atlantic	14	10.2
Mountain	10	7.3
New England	5	3.6
Pacific	19	13.9
South Atlantic	28	20.4
West North Central	9	6.6
West South Central	25	18.2
Missing	2	1.5
Child's GPA		
1.00 – 1.99	3	2.2
2.00 – 2.99	14	10.2

3.00 – 3.99	90	65.7
4.00	27	19.7
Missing	3	2.2

Composite scores were created for parental computer literacy and PAIS by averaging the responses to the survey items pertaining to each variable. Each computer literacy item was rated on a 5-point Likert scale, and the possible range of values for the composite score was 1 to 5. Each parental involvement item was rated on a 4-point Likert scale, and the possible range of values for the composite score was 1 to 4. Descriptive statistics for the composite scores and GPA are displayed in Table 2.

Table 2

Descriptive Statistics for Study Variables

Variable	Min	Max	Mean	Std. deviation	Skewness	Kurtosis
Computer literacy	2.20	5.00	4.07	0.67	-0.35	-0.62
Parental involvement	1.35	4.00	3.01	0.51	-0.41	-0.01
Child's GPA	1.00	4.00	3.05	0.63	-0.59	1.56

A Pearson correlation was computed to determine the correlation between the scores for computer literacy and parental involvement. Table 3 displays the results of the correlation. There was a significant positive correlation ($r = .28$, $p = .001$), indicating that participants with higher computer literacy scores also tended to have higher parental involvement scores.

Table 3

Pearson Correlation Between Computer Literacy and Parental Involvement

Variable		Parental involvement
Computer literacy	Pearson correlation	.28
	Sig. (2-tailed)	.001
	N	137

Results

To answer the research question, a moderated multiple regression analysis was conducted. In this analysis, the independent variable was parental involvement, as operationalized by composite score of the PAIS. The dependent variable was the participant-reported child GPA. The moderator variable was parental computer literacy, as operationalized by the composite score for the ICT Skills Scale. The independent variables and moderator variable were mean-centered for the regression analysis to reduce potential multicollinearity. The regression analysis was conducted in two steps. In the first step, the independent variable (parental involvement) and moderator variable (parental computer literacy) were entered into the regression predicting GPA. In the second step, interaction term for parental involvement x computer literacy was entered into the model.

Before interpreting the results of the regression, the assumptions of the analysis were tested. Normality was tested by inspecting a normal P-P plot of the regression residuals (see Figure 1). The data showed deviation from the normal (diagonal) line,

indicating that the residuals were not normally distributed. However, regression analysis is robust toward deviations from normality when the sample size is larger than 30 to 50 participants, so the analysis was continued. Homoscedasticity was tested by inspecting a scatterplot of residuals and predicted values (see Figure 2). The data were approximately randomly distributed around zero, indicating that the assumption was met. Multicollinearity was tested by calculating variance inflation factors. All variance inflation factors were below 10, indicating that there was no severe multicollinearity in the data. Studentized residuals were computed to check for possible outliers. One case had a studentized residual greater than 3.00 in magnitude.

Figure 1

Normal P-P Plot of Regression Residuals
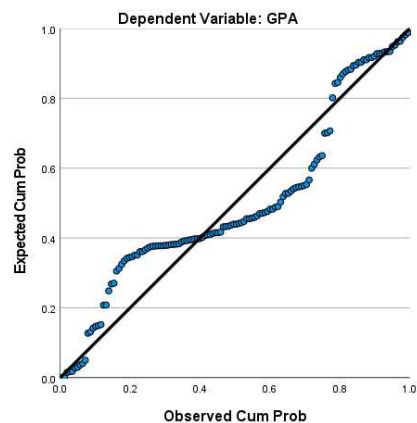
Figure 2

Residuals Versus Predicted Values

Dependent Variable: GPA
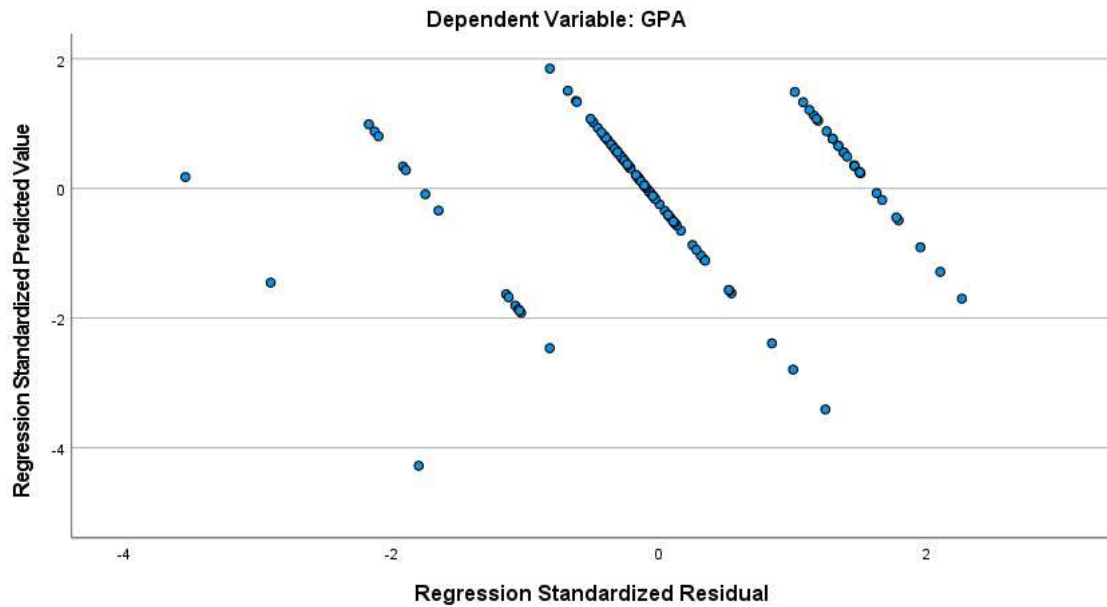
Table 4 displays the results of the moderated regression analysis. The regression model was significant at Step 1, $F(2, 131) = 7.96$, $p < .001$, $R^2 = .11$, indicating that parental involvement and computer literacy significantly predicted GPA. The regression model was significant at Step 2, $F(3, 130) = 6.80$, $p < .001$, $R^2 = .14$, indicating that the model significantly predicted GPA after including the interaction effect. The change in R^2 after adding the interaction effect was significant ($p = .044$), suggesting that there is a significant moderating effect of computer literacy on parental involvement. The null hypothesis was rejected.

Table 4

Coefficients for Moderated Regression

Variable	B	Std. error	Beta	Sig.	VIF
Step 1					
Parental involvement	0.12	0.11	0.10	.257	1.09
Computer literacy	0.27	0.08	0.29	.001	1.09
Step 2					
Parental involvement	0.12	0.10	0.10	.258	1.09
Computer literacy	0.23	0.08	0.25	.005	1.14
Parental involvement x computer literacy	-0.29	0.14	-0.17	.044	1.06

Individual regression coefficients were examined further to determine the nature of the moderation effects. In Step 2, parental computer literacy was a significant positive predictor of GPA ($B = 0.23$, $p = .005$), indicating that participants with higher levels of computer literacy tended to have children with higher GPAs. The main effect of parental involvement on GPA was not significant ($B = 0.12$, $p = .258$), but this result is qualified by a significant interaction between parental involvement and computer literacy ($B = -0.29$, $p = .044$), indicating that computer literacy significantly moderated the effect of parental involvement on GPA. Figure 3 displays a visualization of the moderation effect.

For participants with lower levels of computer literacy, there was a positive relationship between parental involvement and GPA. For participants with higher levels of computer literacy, there was no relationship between parental involvement and GPA.

Figure 3

Moderating Effect of Parental Computer Literacy (ICT) on the Relationship Between Parental Involvement (PAIS) and GPA
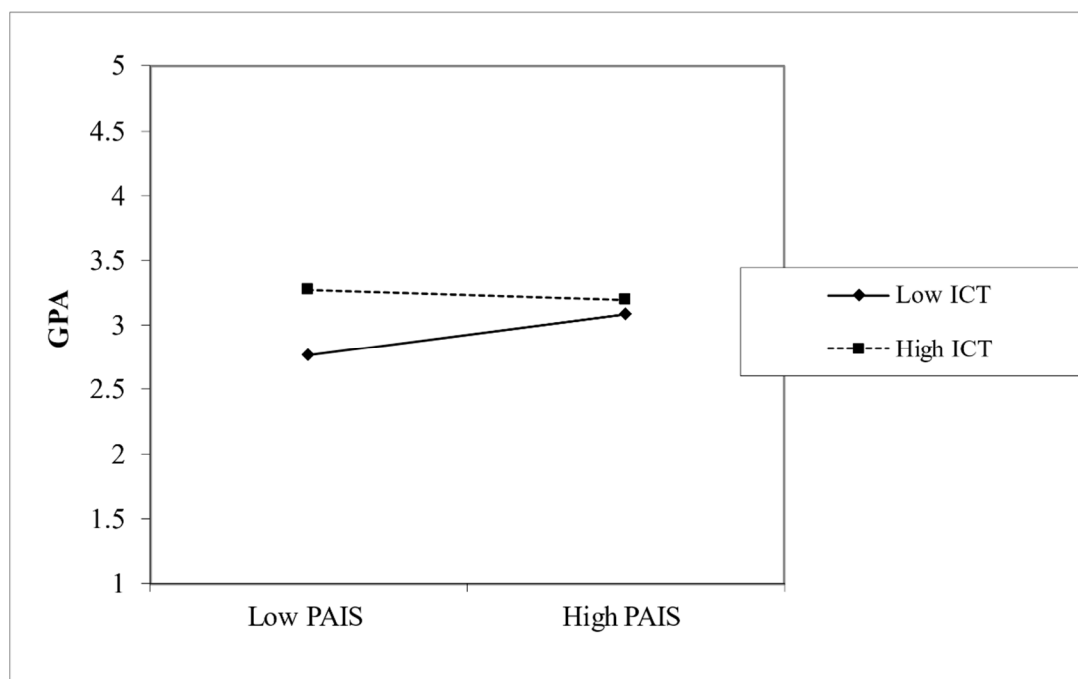
Summary

A moderated regression analysis was conducted to determine if parents' computer literacy moderates the relationship between parental involvement and their children's GPA. The results of the regression showed that the addition of the interaction effect between parental involvement and computer literacy significantly increased the variance in GPA explained by the model, suggesting that computer literacy significantly moderates the relationship between parental involvement and GPA. Specifically, the

results showed that there was a positive relationship between parental involvement and GPA when computer literacy was low, but no relationship was observed when computer literacy was high. The null hypothesis was rejected. Chapter 5 will contain a discussion of these findings and the implications of the findings for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of quantitative correlational study addressed whether parents' computer literacy moderates the relationship between parental involvement and their children's GPAs. Studies show that researchers have not examined the extent to which parents' computer literacy moderates the relationship between parental involvement and student outcomes. As a result, parental involvement in a virtual learning environment may not help students attain their potential as parents lack computer skills required to fully support students in a virtual setting.

I measured parental involvement, the independent variable, using Eng's (2013) PAIS. I measured computer literacy, the moderating variable, using the ITC Skills Scale (Wilkinson et al., 2010). Students' grades in their virtual learning courses were the dependent variable. This study was designed to examine the relationship between parental involvement, computer literacy, and students' grades in their virtual learning courses.

Key Findings

My findings show that students whose parents had high computer skills had higher GPA scores. Likewise, parents with more advanced computer skills were more involved with their students. However, parent involvement did not predict GPA unless parental computer skills were low. This was indicated by the moderated regression analysis, which showed that computer literacy moderated the relationship between parental involvement and GPA.

These findings suggest that parents who had low computer skills may have been able to compensate by being involved in other ways such as making breakfast for them each morning, helping them set up their study area, accompanying them on field trips etc. Hence, students whose parents had both low computer skills and were not involved with their children had the lowest GPA scores.

Interpretation of the Findings

The number of online students is steadily increasing, especially now with an emphasis on online education because of COVID-19 (Sonnenschein et al., 2021). However, the academic success of virtual learners is still below that of their counterparts who attend school in brick-and-mortar settings (Sonnenschein et al., 2021). Students are not learning well in full-time online environments, which usually occurs at home. Virtual students are missing an important component of academic support, where parents or caretakers within the home are unable to provide adequate online support (Sonnenschein et al., 2021).

Parental involvement in student homework has received much attention as researchers have shown how home-based involvement contributes to student learning. Gonida and Cortina (2014) found that parental involvement enhances students' feelings of academic self-efficacy and self-esteem, and consequently students were less inclined to exhibit disruptive behaviors. Students who received consistent academic support from parents performed well academically and socially (Al-Alwan, 2015). A study conducted by Oviatt et al. (2018) explored parental involvement in a virtual learning environment. Virtual school administrators expected the parents to assume some teaching

responsibilities in an independent study course, particularly facilitating interaction through mentoring students and providing instruction (Oviatt et al., 2018). Borup (2016) conducted a case study to ask teachers about their understanding of parents' roles/responsibilities in their child's online learning. The results indicated that teachers observed multiple ways in which parents supported their students by (a) organizing and managing students' schedules, (b) nurturing relationships and interactions, (c) monitoring and motivating student engagement, and (d) instructing students when necessary. Borup, however, did not investigate parents' digital literacy. Hoover-Dempsey and Sandler (2005) also found that parents tend to misunderstand their responsibilities in online learning environments. Parent misconceptions could—in part—be a result of parents' limited experience with online learning combined with their previous role construction that occurred in face-to-face environments.

Parent engagement is largely believed to positively impact student learning (Boonk et al., 2018; Thomas et al., 2019; Willemse et al., 2018). In contrast, researchers who have attempted to correlate levels of parent engagement with course outcomes have not found significant positive relationships between the two variables and in some cases the relationships were negative (Black, 2009; Borup et al., 2013). This finding coincides with my study that showed that parental involvement by itself does not have a have a significant positive effect on student GPA. However, my findings showed that computer literacy moderated the relationship between parental involvement and GPA. Higher parental involvement was only predictive of higher GPA when their computer skills were low, suggesting a compensatory role of parental involvement.

Another finding of my study was that students whose parents had higher computer skills had higher GPA scores. To understand parents' computer skills, Coklar and Sahin (2014) conducted a qualitative study based on the opinions of 25 students from the Department of Computer Education and Instructional Technologies regarding the term *technological literacy*. The participants included 16 male and nine female students between ages 19 and 22. When the recommendations for parents were examined, it was seen that they involved guiding children (51.6%), supervising children (22.6%), following the technology under development (16.1%) and training/getting information in this field (9.7%). Example expressions are given below about the recommendations made by students in terms of parents. For guiding children, it was reported that "Parents should never restrict children to access technology and should find the necessary materials by themselves to assist them. They should use it together and they should guide them" (Coklar & Sahin, 2014, p. 22-M). For supervising children, it was reported that "Parents should monitor their children when using technology. So, they can easily take precautions against any misuse or incomplete use" (Coklar & Sahin, 2014, p. 21-M). For following the technology under development, it was reported that "I strongly recommend that individuals must continuously use the technology to make a positive contribution to their children" (Coklar & Sahin, 2014, p. 21-F). These finding show and tie in with my study that students want parents to be involved and that parents with high computer literacy are more involved and as a result student GPAs are higher.

Rodriguez-de-Dios et al. (2018) examined the influence of two ways of parental mediation (active and restrictive) on the level of teenagers' digital skills and their online

activity. Parental mediation was assessed using twelve items adapted from previous

studies (Khurana et al., 2015; Martínez et al., 2014; Sasson & Mesch, 2014). Five of

these 12 items were designed to measure restrictive parental mediation, whereas seven

items were developed for assessing active or instructive parental mediation. The findings

suggested that adolescents' digital literacy mediates the influence of restrictive, but not of

active, parental mediation on online risks and opportunities. It also suggested that

restrictive parental mediation reduces adolescents' digital skills and as such reduces both

their online risks as well as online opportunities (Rodriguez-de-Dios et al., 2018). This

suggests that parents' computer skills remain essential as they allow teenagers take more

opportunities, and that parents should opt for other ways of mediation rather than

restrictive mediation. My study results support these findings, as they suggest that parents

with high computer literacy are confident to allow their students to navigate the internet

to learn, are more involved, and are better able to supervise them, as a result helping them

learn more freely and achieving higher GPAs.

Hasler Waters and Leong (2014) described parents in online course settings as

co-educators or learning coaches. Hasler Waters and Leong found that students reported

that they received help from the parent role more than twice as frequently as they

received help from those acting in teacher or peer roles. Parents were identified in

approximately two-thirds of the survey responses for non-peer instructing activities.

Parents were engaged to help the student learn self-regulation skills including how to

learn in an online course (76%). Parents also spoke to the online school or instructor on

behalf of the student (71%) and showed the student how to search for resources (68%).

The study showed high percentages of parental engagement in various ways, but Hasler Waters and Leong did not measure computer literacy. My study findings contribute to the research by showing that students whose parents had high computer skills had higher GPA scores.

Additionally, when students feel that parents who are supposed to be their learning coaches are not literate enough to navigate the learning platform, it can create an environment of media conflict (Borup, 2016). My findings show that parental involvement leads to higher GPA score when parents are lacking in computer skills. Hence, parents without computer skills may need to spend more time with their children. The results align with research and create the expectation that support for students will mostly come from parents in an online setting (Oviatt et al., 2018).

Shin and Seger (2016) conducted a study on parents of ELL students who had language barrier issues. These parents were encouraged to make direct contact with their students by blogging. They communicated with their students by drawing encouraging illustrations to show their participation and approval. Parents' blogging encouraged children to participate in virtual schoolwork more readily, and the children looked forward to getting 'feedback' from their parents (Shin & Seger, 2016). The children also reported that receiving comments from family members was the 'best' experience they had with blogging (Shin & Seger, 2016). My findings partially support those of Shin and Seger that parental support especially in the face of low ICT skills is crucial for student performance.

In conclusion, findings from my study show that parental involvement was not related by itself to GPA among their virtual learning children. However, the parents with low ICT skills who were more involved with their students had students with higher GPA. The even higher GPA among students whose parents had high ICT skills demonstrates the added benefit of parental computer literacy for students learning in a virtual environment. Ribble (2009) observed parents are a child's first and most influential teacher. Therefore, the need for parents to influence their children's digital competence is imperative, and this is possible only if parents are also digitally competent. Whether parents are providing nurturing relationships and interacting, advising and mentoring, or monitoring, motivating, organizing, and instructing, some level of digital competence is necessary for them to effectively help their children.

The theoretical framework I used to guide my research was based on Bronfenbrenner's (1977) ecological systems theory. The ecological systems theory holds that ecology of human development can be studied by examining the interactions between people and the changing properties of their immediate settings such as family and peers. The hypothesis from ecological systems theory is that parents, their knowledge of technology, and their children's learning outcomes are related. My study results indicate that in the absence of computer literacy, parental involvement in other ways becomes more important.

Limitations of the Study

One possible limitation of the study was that parents or caretakers were not completely truthful in their answers on the surveys because they may not have wanted to

show themselves as being computer illiterate or inadequate parents. Instead, parents may have answered in ways that put them in a positive light, which is known as social desirability bias (Larson, 2019). Additionally, GPA scores may not have been correctly recorded by parents compared to obtaining reports directly from the respective schools. Another limitation of this study is the use of Survey Monkey's participant pool. Because parents from this participant pool volunteered to take the survey, it may be that these parents were confident in technology usage compared to parents who are not confident and not volunteered for the study. Not having a random recruitment process may diminish the generalizability of the findings to the larger study population. I also was not able to see whether parents that have high ICT skills are generally more highly educated and consequently their children are also perform better academically. There is a possibility that I might be getting an effect that is not related to computer skills but is related more to overall intelligence, education, income levels, and other things that I did not measure in this study. I would also add that these findings are directly related to students in virtual settings where parents are expected to be more involved with their students' education on a regular basis as opposed to parents of students that attend brick and mortar schools.

Recommendations

The following are recommendations for further research based on study findings and limitations. As the study shows that computer literacy moderated the relationship between parental involvement and GPA, a qualitative study could provide more in-depth understanding of the nature, details, and experiences of parental involvement. I would

also recommend obtaining GPA directly from school records rather than from parents to prevent bias or misrepresentation. More attention should be placed on making sure that participants are from ethnic backgrounds as well as socio-economic status**.** I would also recommend including more demographics such as status, income levels, etc., which might give a more targeted explanation as to why GPA scores were higher when parents had ICT skills.

Implications

In conducting this research, I found that parental involvement is key to student achievement when parents' computer skills are low. However, results also showed that students of parents with high computer skills also had a significant increase in GPA. Further research could be conducted to see how parental engagement can be fully effective in a setting where technology is involved but is also constrained in that computer literate parents make a conscious effort to spend quality time with their student without any form of technology. The findings of this study can be used to revise existing policies as well as place emphasis on the need for programs for parents to become familiar with the learning platform of their students.

Family literacy programs are important in their influence for positive change within families. Quality family literacy programs could support parents to become more confident and better advocates for themselves and their children. As parents feel more confident of their own computer abilities, they will be more able to become strong advocates for their children's educational experiences. As parents increase their own computer literacy skills, the whole family becomes stronger and more capable, oftentimes

lifting itself out of a long, intergenerational cycle of poverty and little opportunity. Hence such programs will also help to build literacy skills, cognitive abilities, and self-esteem as well as parenting skills and family relationships. When parents and children can connect with a computer and proper computer literacy, there will be limitless possibilities for learning and growth. The positive social change as a result of the study would contribute towards greater parental support and student outcome.

Conclusion

Our world today revolves around technology and the advancements within. Without doubt, learning has taken on new forms, one of which is virtual learning, which has become increasingly prevalent and important because of the shift to online education and the onset of COVID-19. The potential of virtual learning is great if tools and techniques are put in place at the right time in the right way. One of the most important tools is parental support. This study has shown that parental support in a virtual setting can go a long way in improving student grades, especially when parental computer skills are low.

References

Al-Alwan, A. F. (2014). Modeling the relations among parental involvement, school

    engagement and academic performance of high school students. *International*

    Education Studies, *7*(4), 47–56. DOI:10.5539/ies.v7n4p47

Alcena, F. M. (2014). Parental involvement and its impact on student achievement in

    Florida virtual school. *Distance Learning, 2*, 25.

Allen, E. I., & Seaman, J. (2016). Online report card: Tracking online education in the

    United States. https://onlinelearningsurvey.com/reports/onlinereportcard.pdf

Anderson, K., & Minke, K. (2007). Parent involvement in education: Toward an

    understanding of parents' decision making. *Journal of Educational Research,*

    100(5), 311–323. https://www.jstor.org/stable/27548195

Anshari, M., Alas, Y., & Guan, L. S. (2016). Developing online learning resources: Big

    data, social networks, and cloud computing to support pervasive knowledge.

    Education and Information Technologies, 21(6), 1663–1677.

    https://doi.org/10.1007/s10639-015-9407-3

Arteaga, K. G. (2013). *Promoting secure multiracial identity development: A qualitative*

    study investigating level of knowledge, awareness, and concern among parents of

    multiracial children (Doctoral dissertation). ProQuest Dissertation and Theses

    database. (UMI No. 3515236)

Barnard, W. M. (2004). Parent involvement in elementary school and educational

    attainment. *Child and Youth Services Review, 26*, 39–62.

    https://doi.org/10.1016/j.childyouth.2003.11.002

Bartau-Rojas, I., Aierbe-Barandiaran, A., & Oregui-González, E. (2018). Parental

    mediation of the Internet use of primary students: Beliefs, strategies and

    difficulties. *Comunicar: Media Education Research Journal, 26*(54), 71–79.

    https://doi.org/10.3916/c54-2018-07

Boonk, L., Gijselaers, H. J., Ritzen, H., & Brand-Gruwel, S. (2018). A review of the

    relationship between parental involvement indicators and academic achievement.

    Educational Research Review, 24, 10–30.

    https://doi.org/10.1016/j.edurev.2018.02.001

Borup, J., Graham, C. R., & Davies, R. S. (2013). The nature of parental interactions in

    an online charter school. *American Journal of Distance Education, 27*, 40–55.

    http://doi.org/10.1080/08923647.2013.754271

Borup, J., West, R. E., Graham, C. R., & Davies, R. S. (2014). The adolescent

    community of engagement: A framework for research on adolescent online

    learning. *Journal of Technology and Teacher Education, 22*(1), 107–129.

Borup, J. (2016) Teacher perceptions of parent engagement at a cyber high school.

    Journal of Research on Technology in Education, 48(2), 67–83, https://doi.org/

    10.1080/15391523.2016.1146560

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development.

    American Psychologist, 32(7), 513–531. https://doi.org/10.1037/0003-

    066X.32.7.513

Ceci, S. J. (2006). Urie Bronfenbrenner (1917-2005). *American Psychologist, 61*(2), 173–

    174. https://doi.org/10.1037/0003-066X.61.2.173

Chen, C. J., Toh, S. C., & Fauzy, W. M. (2004). The theoretical framework for designing desktop virtual reality-based learning environments. *Journal of Interactive Learning Research, 15*(2), 147–167.

Coe, A. E. (2010). *The parent participation discourse of a community school: Diverse ideas and perceptions about educational partnership at an inner city community school* (Doctoral dissertation, University of North Texas). https://digital.library.unt.edu/ark:/67531/metadc12098/

Collier, M., Keefe, E. B., & Hirrel, L. A. (2015). Preparing special education teachers to collaborate with families. *School Community Journal, 25*(1), 117–135.

Eleftheria N., G., & Kai S., C. (2014). Parental involvement in homework: Relations with parent and student achievement-related motivational beliefs and achievement. *British Journal of Educational Psychology, 84*(3), 376–396. https://doi.org/10.1111/bjep.12039

Eng, S. (2013). Cambodian early adolescents' academic achievement: The role of social capital. *The Journal of Early Adolescence, 33*(3), 378–403. https://doi.org/10.1177/0272431612441069

Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. *Computers & Education, 64*, 175–182. https://doi.org/10.1016/j.compedu.2012.10.008

Hasler Waters, L. & Leong, P. (2014). Who is Teaching? New Roles for Teachers and Parents in Cyber Charter Schools. Journal of Technology and Teacher Education,

22(1), 33-56. Waynesville, NC USA: Society for Information Technology & Teacher Education. Retrieved August 4, 2022 from https://www.learntechlib.org/primary/p/112373/.

Jered Borup (2016) Teacher Perceptions of Parent Engagement at a Cyber High School, Journal of Research on Technology in Education, 48:2, 67-83, DOI: 10.1080/15391523.2016.1146560

Larson, R. B. (2019). Controlling social desirability bias. International Journal of Market Research, 61(5), 534-547. DOI: 10.1177/1470785318805305

Limin Gu. (2017). Using school websites for home–school communication and parental involvement? Nordic Journal of Studies in Educational Policy, 3(2), 133–143. https://doi-org.ezp.waldenulibrary.org/10.1080/20020317.2017.1338498

LaPrade, K., Marks, A., Gilpatrick, M., Smith, D., & Beazley, J. (2011). Walking through online classrooms: A study in best practices. *Review of Higher Education & Self-Learning, 3*(9), 24–30.

Lau, J., & Ng, K. (2014). Conceptualizing the counseling training environment using Bronfenbrenner's ecological theory. *International Journal for the Advancement of Counselling, 36*(4), 423–439. doi:10.1007/s10447-014-9220-5

Machado-Casas, M., Sanchez, P., & Ek, L. D. (2014). The digital literacy practices of Latina/o immigrant parents in an after-school technology partnership. *Multicultural Education, 21*(3/4), 28–33.

Malene Thisgaard, & Guido Makransky. (2017). Virtual Learning Simulations in High School: Effects on Cognitive and Non-cognitive Outcomes and Implications on

the Development of STEM Academic and Career Choice. Frontiers in

    Psychology. https://doi-org.ezp.waldenulibrary.org/10.3389/fpsyg.2017.00805

McWayne, C., Hampton, V., Fantuzzo, J., Cohen, H., & Sekino, Y. (2004). A

    multivariate examination of parent involvement and the social and academic

    competencies of urban kindergarten children. *Psychology in the Schools, 41*(3),

    363-377. https://doi.org/10.1002/pits.10163

Noguerón-Liu, S. (2017). Expanding Notions of Digital Access: Parents' Negotiation of

    School-Based Technology Initiatives in New Immigrant Communities. Equity &

    Excellence in Education, 50(4), 387–399. https://doi-

    org.ezp.waldenulibrary.org/10.1080/10665684.2017.1395301

Sonnenschein, S., Grossman, E. R., & Grossman, J. A. (2021). US parents' reports of as-

    sisting their children with distance learning during covid-19. Education Sciences,

    11(9), 501. https://doi.org/10.3390/educsci11090501

Selwyn, N., Banaji, S., Hadjithoma Garstka, C., & Clark, W. (2011). Providing a

    platform for parents? Exploring the nature of parental engagement with school

    learning platforms. *Journal of Computer Assisted Learning, 27*(4), 314–323.

    doi:10.1111/j.1365-2729.2011.00428.x

Shin, D. S., & Seger, W. (2016). Web 2.0 technologies and parent involvement of ELL

    students: An ecological perspective. *Urban Review, 48*(2), 311–332.

    https://doi.org/10.1007/s11256-016-0356-y

Thomas, V., De Backer, F., Peeters, J., & Lombaerts, K. (2019). Parental involvement and adolescent school achievement: The mediational role of self-regulated learning. Learning Environments Research, 22(3), 345-363. https://doi.org/10.1007/s10984-019-09278-x

Van Voorhis, F., Maier, M., Epstein, J., & Lloyd, C. (2013). THE IMPACT OF FAMILY INVOLVEMENT ON THE EDUCATION OF CHILDREN AGES 3 TO 8 A Focus on Literacy and Math Achievement Outcomes and Social-Emotional Skills. https://files.eric.ed.gov/fulltext/ED545474.pdf

Willemse, T. M., Thompson, I., Vanderlinde, R., & Mutton, T. (2018). Family-school partnerships: a challenge for teacher education. Journal of Education for Teaching, 44(3), 252-257. https://doi.org/10.1080/02607476.2018.1465545

Wang, M., & Sheikh-Khalil, S. (2014). Does parental involvement matter for student achievement and mental health in high school? *Child Development, 85*(2), 610–625. doi:10.1111/cdev.12153

Wilkinson, A., Roberts, J., & While, A. E. (2010). Construction of an instrument to measure student information and communication technology skills, experience and attitudes to e-learning. *Computers in Human Behavior, 26*(6), 1369–1376. https://doi.org/10.1016/j.chb.2010.04.010

Xianhui Wang, & Wanli Xing. (2018). Exploring the Influence of Parental Involvement and Socioeconomic Status on Teen Digital Citizenship: A Path Modeling Approach. Journal of Educational Technology & Society, 21(1), 186–199.

Appendix B: Survey Instruments

QUESTIONNAIRE

PARENTAL COMPUTER LITERACY AND INVOLVEMENT IMPACTING STUDENT OUTCOMES
IN HOME BASED VIRUTAL LEARNING

STUDY CONDUCTED BY **Veena Sangram**

**Thank you for your voluntary participation in responding to this questionnaire.
All data contained in this questionnaire are strictly confidential and anonymous**

Please answer the following questions to the best of your ability. On the right of each question is
the response scale of five choices from which you need to tick √or **X** only **ONE** answer

PARENTAL COMPUTER LITERACY

S. No	Questions	Stongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	I know how to create a folder	☐	☐	☐	☐	☐
2	I feel confident closing down a software program	☐	☐	☐	☐	☐
3	I do not feel confident attaching a file to an email	☐	☐	☐	☐	☐
4	I can use a word processing application	☐	☐	☐	☐	☐
5	I know how to save a document to a folder	☐	☐	☐	☐	☐
6	I would not recognize a PDF(Portable document file)	☐	☐	☐	☐	☐
7	I feel confident making selections from popup menus	☐	☐	☐	☐	☐
8	I would find it difficult to search a database of references to journals papers	☐	☐	☐	☐	☐
9	I feel confident using a computer to write a letter or essay	☐	☐	☐	☐	☐
10	I do not know how to find an article in an e-journal	☐	☐	☐	☐	☐

Parental experience with computers

		Never	Rarely	Sometimes	Often

11	I have used computers at work/school	☐	☐	☐	☐
12	I feel disadvantaged by my lack of experience with computers	☐	☐	☐	☐
13	I communicate with people using email	☐	☐	☐	☐
14	I have used computers to look for information for example: Library catalogue/books	☐	☐	☐	☐
15	I have used computers to support my learning	☐	☐	☐	☐
16	I have used computers to find out about careers	☐	☐	☐	☐
17	I have used computers for leisure	☐	☐	☐	☐

Parents' Academic Involvement Scale

		Rarely	Someti mes	Often	Always
18	I provide my child with learning opportunities	☐	☐	☐	☐
19	I tell my child how I expect him/her to behave at school	☐	☐	☐	☐
20	I tell my child to study more than play	☐	☐	☐	☐
21	I tell my child to listen and respect the teacher at school	☐	☐	☐	☐
22	I say positive things to my child about his/her school	☐	☐	☐	☐
23	I talk to my child about how important school is	☐	☐	☐	☐
24	I buy educational materials for my child	☐	☐	☐	☐
25	I prepare breakfast for my child before going to school	☐	☐	☐	☐
26	I ask my child to study at night	☐	☐	☐	☐
27	I observe my child's academic progress	☐	☐	☐	☐
28	I ask my child about his/her monthly scores	☐	☐	☐	☐
29	My child hears me praise others who do well in school	☐	☐	☐	☐
30	I give money to my child to take extra classes	☐	☐	☐	
31	I give money to my child to buy educational material	☐	☐	☐	☐
32	I control the amount of TV viewing of my child	☐	☐	☐	☐

#					
33	I ask my child about his/her day	☐	☐	☐	☐
34	**I review my child's school work on a regular basis**	☐	☐	☐	☐
35	I open my child's books after he/she comes back from school	☐	☐	☐	☐
36	I talk to my child about what they want to be when they grow up	☐	☐	☐	☐
37	I ask my child what he/she learned at school	☐	☐	☐	☐
38	I give my child rewards when he/she does well in school	☐	☐	☐	☐
39	I help my child practice what he/she learns at school	☐	☐	☐	☐
40	I prepare/dress my child before s/he goes to school	☐	☐	☐	☐
41	I take my child to school	☐	☐	☐	☐
42	When my child gets off from school, I pick him/her up	☐	☐	☐	☐

	1-1.99	2-2.99	3-3.99	4.0
What was your child's most recent GPA	☐	☐	☐	☐