

An Analysis of Georgia Hybrid Program Characteristics and Hybrid Homeschool Student  
Academic Achievement

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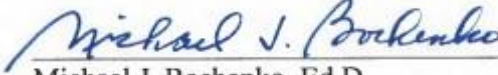
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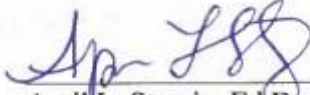
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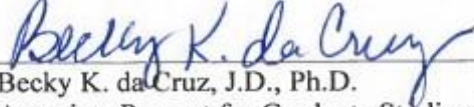
This dissertation, "An Analysis of Georgia Hybrid Program Characteristics and Hybrid Homeschool Student Academic Achievement," by Sharon Masinelli, is approved by:

**Dissertation  
Committee  
Chair**   
Michael J. Bochenko, Ed.D.  
Associate Professor  
Leadership, Technology, & Workforce Development

**Dissertation  
Committee  
Research Member**   
April L. Strevig, Ed.D.  
Assistant Professor  
Leadership, Technology, & Workforce Development

**Committee  
Member**   
Kathy D. Nobles, Ed.D.  
Assistant Professor  
Leadership, Technology, & Workforce Development

**Committee  
Member**   
Eric S. Wearne, Ph.D.  
Assistant Professor  
Coles College of Business / Kennesaw State University

**Associate Provost  
for Graduate Studies  
and Research**   
Becky K. da Cruz, J.D., Ph.D.  
Associate Provost for Graduate Studies & Research  
Professor of Criminal Justice

**Defense Date:** October 23, 2024

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## ABSTRACT

As homeschooling numbers rose following the COVID-19 pandemic, nontraditional education such as hybrid homeschooling was reported as a desirable option by parents. This dissertation examines the academic outcomes of homeschool and hybrid homeschool students in Georgia following the rise of post-COVID nontraditional education. Hybrid homeschooling, a blend of homeschooling and private education, has grown in popularity and yet the impact on student achievement remains largely unexplored. This study analyzes SAT performance among homeschool and hybrid homeschool students, comparing it to public and private school averages using a quantitative methodology. A series of t-tests, ANOVAs, and ultimately a multiple regression analysis was performed after administering an anonymous survey to Georgia hybrid homeschool families and homeschool families. Results indicate both homeschool and hybrid homeschool students scored significantly higher on the SAT than their public and private school counterparts. However, no significant difference was found between homeschool and hybrid homeschool students' SAT scores. Further analysis of factors such as set schedules, parental assistance, days attended in hybrid programs, and hybrid program characteristics aligned to Epstein's Theory of Parental Involvement revealed no significant predictive relationship with SAT scores.

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## **Chapter I**

### **INTRODUCTION**

#### **Overview**

With the increased popularity of home education since the COVID-19 pandemic, both homeschool and hybrid homeschool options have become arguably more well-known than ever before (Eggleston & Fields, 2021). In Georgia, the number of homeschool students increased 50% between 2015 and 2022 (White, 2023). Hybrid homeschooling was a desirable option reported by more than 40% of families in the post-pandemic period (McShane, 2021). Hybrid homeschool programs are educational programs in which students attend traditional classes several days a week at a brick-and-mortar institution while homeschooling on the remaining days (Wearne, 2016). Hybrid homeschooling is not a new phenomenon, yet there is limited research to describe this alternative education (Brobst, 2014; Herndon, 2019; Wearne, 2016, 2017, 2019a, 2019b, 2020, 2021). While the size of the hybrid population is unknown, hybrid homeschooling is an alternative education which may have grown more popular due to COVID-19 school shutdowns (McShane, 2021).

All hybrid homeschool options inherently require more parental involvement than comparable five-day programs (McShane, 2021). Parents are required to assume the responsibility of a primary educator on the days when a student does not attend classes. Hybrid homeschool programs have a range of homeschool days and program characteristics. The in-person days for a hybrid homeschool program could be as little as

one day a week or as many as four days a week. Some program characteristics may result in additional parental involvement, even when comparing very similar hybrid homeschool programs.

As research is so limited for hybrid homeschooling, large-scale studies on the academic outcomes of these programs have not yet been reported (Wearne, 2020). Epstein's (1995) Model of Parental Involvement theorized students are more successful when there is a collaboration between parents and schools. Hybrid homeschool programs are potentially a prime example of collaboration between home and school. The purpose of this study is to examine hybrid homeschool student academic achievement in terms of Georgia hybrid homeschool program characteristics. Hybrid program characteristics included program accreditation, the number of days on-site, involvement of parents in decision-making, support for parents from the program, and parent-teacher communication.

A survey distributed to 11th and 12th grade hybrid homeschool families provided data to reveal how various Georgia hybrid programs function and how these program characteristics may predict academic outcomes. Four levels of Epstein's model, *parenting, communication, learning at home, and decision-making*, link directly to questions on the survey. A deeper look into the varying levels of hybrid homeschool program characteristics and subsequent SAT and ACT scores may demonstrate the effectiveness of Epstein's model as implemented within a hybrid homeschool setting.

### **Problem Statement**

A new alternative education concept termed hybrid homeschooling was introduced into the journal literature in 2016 (Wearne, 2016). Wearne (2016) described

hybrid homeschools as “schools in which students attend school with other students for two or three days per week in traditional classroom settings and are homeschooled the balance of the week” (p. 1). Homeschooling is a nontraditional educational method where students “receive instruction at home instead of at a public or private school” (NCES, 2018, para. 2). The trend for homeschool education is on the rise, with the percentage of homeschool students increasing significantly from 1999 (1.7% of school-age students) and remained steady at 3% in 2016 (Grady, 2017). Due to the COVID-19 pandemic, 13% of parents chose to homeschool their children in Fall 2020 (Diperna, Catt, & Shaw, 2020). Nearly 60% of parents surveyed by EdChoice in 2023 stated they preferred their child have at least one day a week of learning at home.

The academic achievement of hybrid homeschool students alongside the hybrid homeschool program characteristics has minimal research addressing the two. Academic achievement, measured through standardized testing, is the preferred method of predicting college success for homeschool students (Yu, Sackett & Kuncel, 2016) and is the chosen method for the hybrid homeschool students in this study as well. This study provides a foundation for establishing hybrid homeschool student academic achievement in terms of the basic characteristics of a standard hybrid homeschool program in Georgia. Hybrid program characteristics included in this study were program accreditation, the number of days on-site, involvement of parents in decision-making, support for parents from the program, and parent-teacher communication. The survey implemented in this study gave hybrid homeschool families the opportunity to reveal how the hybrid programs function and routines implemented while learning at home.

## **Purpose of the Study**

This study aimed to examine Georgia's hybrid homeschool program characteristics and discover possible predictors in student achievement. In pursuit of the research goals, this study required a review of Georgia hybrid homeschool program characteristics such as parent-teacher communication, support for parents from the program, involvement in decision-making, program accreditation, the number of days on-site, and hybrid homeschool student practices while learning at home in addition to standardized test scores. The definition of hybrid homeschool student is any student who attends a program in the state of Georgia advertised as a "hybrid" or "university model" program. Students who attend a homeschool cooperative or take classes a la carte were also identified in the survey. A la carte classes, classes taken as needed and offered exclusively by some groups, are described in the National Hybrid Schools Project as an indicator of a homeschool cooperative (Wearne & Thompson, 2022).

A survey inquiring about hybrid homeschool program characteristics and homeschool learning routines was the primary source of data collection. Multiple aspects of Epstein's Theory were tested with four research questions providing a foundation for this study. The first research question focuses on a comparison of the academic achievement of Georgia hybrid homeschool students, homeschool students, private school students, and students who attend public schools. The second and third questions focus on learning at home routines for Georgia hybrid homeschool students compared to homeschool students. The fourth question focuses on predictors for standardized test scores when reviewing Georgia hybrid homeschool program characteristics.

## **Research Questions**

Research Question 1 - Is there a significant difference between 11th and 12th Georgia students in homeschool, hybrid homeschool, public high school, and private high school on SAT and ACT scores?

Research Question 2 - Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of set homeschool day schedules on SAT and ACT scores?

Research Question 3 - Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of parental assistance on SAT and ACT scores?

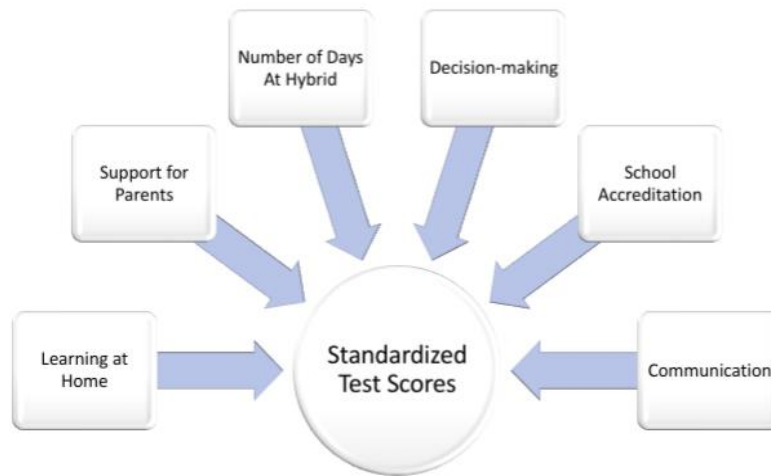
Research Question 4 - Are Georgia hybrid homeschool program characteristics (program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the program; parent-teacher communication; use of set schedule; and levels of parental assistance) significant predictors of Georgia hybrid homeschool students' performances on the SAT and ACT?

The first research question for this inquiry provides a basis for how Georgia hybrid homeschool students compare to other students in terms of academic achievement. This provided a baseline prior to analysis of other variables affecting standardized test scores. The data required to answer this research question originates from the College Board, ACT, and the surveys to both hybrid homeschool parents and homeschool parents. The survey allows hybrid homeschool and homeschool parents to report their student's standardized test scores.

Research Question 2 seeks to determine the typical practices of Georgia hybrid homeschool students and homeschool students in the process of *learning at home*. The data collected for this question also originate from the survey. The survey includes questions about the standard homeschool practices such as the number of hours spent on school assignments and the use of daily schoolwork schedules on homeschool days.

Research Question 3 pursues the level of parental assistance of Georgia hybrid homeschool students and homeschool students in the process of *learning at home*. The data collected for this question originates from the parent survey. The survey includes questions about the number of hours per day spent with parents completing schoolwork during a typical homeschool day.

The third of the four research questions worked towards identifying predictors of Georgia hybrid homeschool students' performances on a standardized test while *learning at home* as well as Georgia hybrid homeschool program characteristics. The data required for this question originates from the survey questions regarding hybrid homeschool program characteristics and standardized test scores. The core concept involved in this study is standardized test scores with influencing factors of hybrid homeschool program characteristics and *learning at home* (Figure 1).



*Figure 1. Concept map of standardized test scores as influenced by hybrid homeschool program characteristics and homeschool day routines*

Research Question 4 directly links to the core concept found on the concept map. Research questions one, two, and three must be answered to provide the foundation for appropriately answering research question four. Research question one establishes if there is a difference in academic achievement between Georgia hybrid homeschool students and students in other forms of education, as previously implied by the works of Brobst (2014) and Herndon (2019). Research questions two and three identify the commonalities for homeschool and hybrid homeschool students' at-home learning which is a vital part of the theoretical framework. Research question four assists in determining how individual Georgia hybrid homeschool program characteristics play a role in the theoretical framework.

### **Theoretical Framework**

The theoretical framework chosen for this study is Epstein's Model of Parental Involvement (Epstein, 1995). Joyce Epstein developed a theory with three spheres of influence and six levels of parental involvement designed to create a partnership between

parents and schools and maximize learning. These levels include *parenting*, *communication*, *volunteering*, *learning at home*, *decision-making*, and *collaboration with the community*. Four of these levels, *parenting*, *communication*, *learning at home*, and *decision-making* link directly to this hybrid homeschool study and theoretically influences standardized test scores as displayed earlier in the concept map (Figure 1). From a hybrid homeschool program perspective, the schools participate in Epstein's Model by collaborating with the parents as "partners" (Legacy Classical Christian Academy, 2017, para. 1). Epstein stated, "Partnerships are important for helping students succeed" (Epstein, 1995, p. 3).

Epstein's Theory provides the most comprehensive model for this study through the use of four concepts involved in this inquiry (Epstein, 1995). Epstein's (1995) *parenting* level includes *support for parents* which is a hybrid homeschool program characteristic. *Communication*, *learning at home*, and *decision-making* were also directly investigated through the intended survey. Per the concept map, influential concepts for standardized test scores were *support for parents*, *decision-making*, *communication*, and *learning at home*.

Multiple school districts support Epstein's Theory and distribute literature regarding Epstein's theoretical levels on their websites (Boise School District, 2019; Francis Howell School District, 2015; State of New Jersey DOE, n.d.). The description of Epstein's theoretical *parenting* level involves school support for a nurturing home environment (Epstein, 1995). Hybrid homeschool programs work to provide a support system, sometimes with workshops and most often with teacher guidance (Legacy Classical Christian Academy, 2017; UMSI, 2020a). Epstein's *learning at home level*

(Epstein, 1995) requires parents to fulfill their role in the hybrid homeschool model as the teacher in the home (UMSI, 2020a). Communication is also a crucial part of Epstein's Theory (Epstein, 1995). Hybrid homeschool programs seek to provide "optimum teacher-parent communication" (Legacy Classical Christian Academy, 2017, para. 2).

School accreditation and the number of days at the hybrid homeschool program are not addressed by Epstein's Theory, but the hybrid homeschool parent survey questions address these concepts for this study. While the number of days at school were not directly found within Epstein's Theory, the concept is indirectly tested by placing more emphasis on the *learning at home* portion of her theory, although likely a disproportionate amount to what Epstein originally intended. While some concepts of Epstein's Theory were modified for this study, it remains a solid theoretical foundation for testing hybrid homeschool programs as demonstrated in Table 1. The study's research questions ultimately test Epstein's Theory of *support for parents, decision-making, communication, and learning at home* in a variety of Georgia hybrid homeschool programs. Aligning Epstein's Theory to this study allows the researcher to fulfill many of the needs of the intended study's objectives. Theoretically, hybrid homeschool program students may perform better on the standardized tests based on hybrid homeschool program characteristics supporting increased parental involvement.

**Table 1**

*Research Question Alignment with Epstein's Theory*

Research Question	Variable	Theory Concept/Purpose
1 - Is there a significant difference between 11th and 12th Georgia students in homeschool, hybrid homeschool, public high school, and private high school on SAT and ACT scores?	Dependent variable: standardized test scores Independent variable: method of schooling	Determines how Georgia hybrid homeschool students compare academically to other types of students
2 - Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of set homeschool day schedules on SAT and ACT scores?	Dependent variable: standardized test scores Independent variables: method of schooling (homeschooling vs hybrid homeschooling), the use of a specific schedule for homeschooling	Determines level of homeschooling to test theoretical concept of <i>learning at home</i>
3 - Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of parental assistance on SAT and ACT scores?	Dependent variable: standardized test scores Independent variables: method of schooling (homeschooling vs hybrid homeschooling) and level of parental assistance in homeschooling	Determines level of parental assistance to test theoretical concept of <i>learning at home</i>
4 - Are Georgia hybrid homeschool program characteristics (program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the program; parent-teacher communication; use of set schedule; and levels of parental assistance) significant predictors of Georgia hybrid homeschool students' performances on the SAT and ACT?	Dependent variable: standardized test scores Independent variables: program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the program; parent-teacher communication; use of set schedule; and levels of parental assistance	Tests the theory concepts of <i>support for parents, communication, learning at home, and decision-making</i>

## Literature Review

There are only two formally published studies regarding the academic achievement of hybrid homeschool students. Brobst (2014) and Herndon (2019) studied the academic achievement of University Model School (UMS) students. Brobst (2014) studied 156 traditional private high school students and 90 hybrid homeschool students within several University Model Schools in Texas. Both groups were predominantly White yet the UMS sample was more ethnically diverse than the traditional high school sample. The UMS group was 2.22% African-American, 1.1% Bi-racial, 4.04% Hispanic, 3.33% Unknown, and 88.89% White. Comparatively, the traditional high school group was 1.94% African-American, 1.94% Pacific-Islander, and 96.77% White. Brobst (2014) found UMS students attending school two to three days a week averaged SAT composite scores 32.081 points higher (95% confidence intervals from -63.665 to -1.937) than students who attended five-day Christian schools. However, UMS students did not score significantly higher than the traditional students on the SAT Writing section ( $\beta = -.046$ ). In terms of ACT scores, initially Brobst concluded the UMS students scored significantly higher than the traditional students ( $F(10, 132) = 17.268; p < .001$ ). She contradicted that conclusion when she found the  $\beta$  value for school type was  $-.026$ . Therefore, her final conclusions demonstrated the hybrid homeschool student group scored better than the traditional students only on the SAT composite test but not on the SAT Writing or ACT.

Herndon (2019) similarly found UMS students averaged a higher ACT score than all other students combined. The UMS participants in his study who graduated in 2017

reported a mean ACT score of 26.45 which was significantly higher than the mean of all ACT test takers in 2017.

Reviewing many types of homeschool studies over a 20 year period has resulted in a mix of results that likely included hybrid homeschool students (Qaqish, 2007, Ray & Eagleson, 2008, Rudner, 1999). Hybrid homeschool families frequently view themselves as homeschool families (Wearne 2020), allowing for participation in homeschool studies. Rudner (1999) reported results which included 7.7% of homeschool students enrolled in a full-service curriculum. Ray and Eagleson (2008) studied any families identified as homeschoolers. With a significant gap in the research regarding academic achievement and hybrid homeschool students, it is ideal to expand the search and increase the overall insight into the mixed homeschool/hybrid homeschool population. These unique studies also assist with creating a standard of academic achievement for the homeschool community.

Ray and Eagleson (2008) published a large-scale study of homeschool students solely for the purpose of determining academic achievement in relation to individual state regulations. There is a high level of variation between all 50 states in terms of homeschool regulation. Ray and Eagleson rated the regulations on a scale from low to high. As the level of regulation increases, hybrid homeschool students were more likely to be required to register as a homeschooler (Wixom, 2015). With over 6,000 participants in their study, it is quite probable Ray and Eagleson (2008) included hybrid homeschool students who registered as a homeschool student in their state. Comparing their results to the NCES (2019) national averages, the homeschool population scored an average verbal SAT score (582.4) higher than the traditional school students (502). The

average math score of the homeschool students (538) was also slightly higher than the traditional student scores (515).

Qaqish (2007) reviewed the academic achievement of students who classified themselves as homeschool. His research focused on the ACT mathematics score. His work suggested students who identified as homeschooled scored more poorly than the non-homeschooled students. There were over 1,000 students in this study and the homeschool students missed two additional questions out of 60 compared to traditional students.

Rudner (1999) researched standardized test scores for over 20,000 students, some of which used a full-service curriculum. Rudner's study was distributed directly by the testing provider and the test scores came directly from the testing company. The average homeschool student enrolled in the study scored in the 70th-80th percentile. Comparatively, public or private school students scored in the 65th-75th percentile. Rudner also reviewed his data for score differences between homeschool students and the students who were using a full-service curriculum. There were no significant differences in their test scores ( $F_{\text{enrollment}} = .24; df = 1,9750$ ).

### **Research Design**

This was a nonexperimental survey design with group comparisons and correlational methods. Examination of the relationship between hybrid homeschool program characteristics and standardized test scores were reported. Through distribution of a survey, families could respond anonymously. The data obtained from the survey was analyzed with no manipulation of the variables.

## **Population**

The hybrid homeschool population is essentially unknown. There are no consistent registries for homeschoolers on a national level (Coalition for Responsible Home Education, 2017). The National Hybrid Schools Survey (Wearne & Thompson, 2022) is the only annual survey designed to target hybrid homeschool programs and is limited to volunteer responses. The Hybrid Schools Report does not include an estimate of the overall population. The intended sample consisted of hybrid homeschool programs only within the state of Georgia. Georgia reported 74,066 homeschool students in 2019 (International Center for Home Education Research, 2023). Extrapolating from national statistics of students attending school part-time, Georgia may have approximately 13,000 hybrid homeschool students.

## **Data Collection Methods**

This study used purposeful selection of programs identified as “hybrid” within Georgia. A cross-sectional online survey was employed in an attempt to generalize the Georgia hybrid homeschool program population (Creswell, 2015). An email sent to all identified hybrid program administrators requested participation from their 11<sup>th</sup> and 12<sup>th</sup> grade families. Willing participants were given a Qualtrics survey link and responses were collected for twelve weeks.

Other data required for this study was collected through websites which report the average private and public school test scores in Georgia. Responses from the homeschool survey gave the average homeschool SAT and ACT scores. The public school Georgia scores are published and readily available on the Georgia Department of Education website.

The 2018 Concordance Table from the ACT website provided the data necessary to convert all ACT scores to SAT scores prior to data analysis (ACT, 2018).

### **Instrumentation**

This inquiry uses information obtained from the SAT, ACT, as well as the online survey. The ACT and SAT are administered to millions of students per year (ACT, 2018; College Board, 2020). With over 50 years of research (Ferguson & Maxey, 1976; Lawrence, Rigol, Essen, & Jackson, 2003; Lins, Abell, & Hutchins, 1966) and published data for the SAT and ACT (Nayar, 2015), these instruments provide an insight into academic achievement.

The ACT tests students in the areas of English, mathematics, reading, and science (ACT, 2018). Each administration of the ACT contains a minimum of 215 questions and is scored on a scale of 1-36 (ACT, 2022). Core high school skills are tested based on years of research. These core skills include conventions of standard English, Algebra, Geometry, Statistics, reading comprehension and understanding of natural sciences. A composite score is reported as an average of the four sections.

The SAT is a 154-question exam with individual sections in Reading, Writing and Language, Math Part 1, and Math Part 2 (College Board, 2017). The test was designed to predict “success in postsecondary education” (College Board, 2017, p.6). Unlike the ACT, SAT scoring is different for some sections. The Math section scores range from 200 to 800, Reading and Writing from 400 to 1600, and Language from 400 to 1600. A total score of 400-1600 is reported based on the sum of the Math score Reading and Writing and Language sections combined.

No previously published surveys were modifiable for the purpose of this study. The survey questions were designed to align with the research questions. The survey was validated with a validation study and expert panel review. Research Question 1 resulted in a survey question requesting the standardized test score for homeschool and hybrid homeschool students. Requested information for SAT and ACT scores was planned to compare public and private school scores. Research Questions 2 and 3 aligned with survey questions requesting the number of hours spent in *learning at home*, number of hours spent in direct parent-student learning, and the use of a schedule. Research Question 4 required survey questions to determine characteristics of the hybrid homeschool programs.

### **Data Analysis Procedures**

The method of analysis for the first research question was an ANOVA and two sample t-tests. An ANOVA compares means between multiple groups across a continuous variable (Kent State University, 2020). The second and third research questions used a factorial ANOVA method of analysis. The factorial ANOVA assesses differences between two or more groups with one dependent variable and multiple independent variables (Strunk & Mwavita, 2020). The analysis technique for the fourth research question required a multiple linear regression to assess the impact of hybrid program characteristics on standardized test scores. According to Pedhazur (1997), “Multiple regression analysis (MR) is eminently suited for analyzing collective and separate effects of two or more independent variables on a dependent variable” (p. 3). In this particular case, the standardized test score is the dependent variable. The independent variables were program accreditation, the number of days on-site,

involvement of parents in decision-making, parental support from the program, parent-teacher communication, number of hours spent on school assignments at home, the number of hours per day spent with parents in completing schoolwork, and the use of a specific schedule for *learning at home*.

### **Significance**

A literature review demonstrates a gap in research regarding hybrid homeschool program characteristics and hybrid homeschool student academic achievement. Wearne (2020) noted parents often choose these hybrid homeschool programs because the parents feel the programs offer a better learning environment. Research to fill the gap of hybrid homeschool program characteristics and corresponding academic achievement is significant as it builds on the current literature regarding this alternative education trend. Several dissertations have already attempted to fill the research gap by reviewing standardized test scores for students in University Model Schools (Brobst, 2014; Herndon, 2019). However, their research did not correlate scores with hybrid homeschool program characteristics.

A deeper understanding of this issue through this study makes the following contributions:

- parents who have chosen hybrid homeschool programs will obtain a greater understanding of the expected academic outcomes based on hybrid homeschool program characteristics,
- hybrid homeschool programs will obtain a greater understanding of the impacts of their chosen program characteristics,

- public and private schools hoping to reduce expenses associated with five full days of on-site classes could learn effective methodologies that are successful in a hybrid homeschool format.

### **Limitations, Delimitations, and Assumptions**

Limitations of this study include the difficulty in finding all Georgia hybrid homeschool programs. Efforts were made to discover as many programs as possible. Accurately differentiating between a cooperative and a hybrid program is another limitation. Other limitations include those of the standardized tests, ACT and SAT, and the chosen hybrid homeschool program characteristics. The standardized tests measure a select group of cognitive measures, thereby limiting the study results only to the areas in which these tests measure (ACT, 2015). Confounding variables such as length of time the student was enrolled in a hybrid homeschool program and the demographics of the hybrid population should be considered. Economically disadvantaged students have been shown in prior studies to demonstrate lower scores (Banerjee, 2016). The specific demographics of Georgia hybrid homeschool students is a limitation given prior studies which have shown hybrid homeschool students are not economically disadvantaged. COVID-19 shutdowns prevented some students from taking standardized tests during 2020 (College Board, 2020). Additionally, the study is limited by the boundaries of the survey.

Delimitations define the boundaries of a study (Simon, 2011). Sampling the entire hybrid homeschool population of the United States would be a huge undertaking. The programs are difficult to locate, necessitating a smaller-scale study to produce results within the given timeline. As this researcher has ties to the Georgia hybrid homeschool

community, the delimitations of this study were defined by a sampling of the Georgia hybrid homeschool population. Other delimitations included the selection of Epstein's Theory as compared to others that would have required surveying contributions from the community.

The assumptions for this study include:

- consistent prevalence of hybrid homeschool programs in the state of Georgia. If the number of programs declines significantly or if a law passes that severely limits the function of hybrid homeschool programs, the minimum number of participants might not be met.
- eligible participants of hybrid homeschool programs in Georgia will be accurately identified (Rogers & Richarme, 2009)
- honest, as well as careful responses, from all survey respondents (Meade & Craig, 2012)

### **Definition of Key Terms**

The key terms necessary for this study are listed below.

*Accreditation* - a hybrid homeschool program certified as accredited through multiple accreditation bodies such as Georgia Accrediting Commission, the Southern Association of Independent Schools, Georgia Private School Accreditation Council, the Association of Christian Schools International, and more (Forsyth County Schools, n.d.).

*Academic achievement* - a measure of educational progress and predictor of college success as determined by standardized testing (Yu, Sackett & Kuncel, 2016). The SAT and ACT was the measure of academic achievement in this study.

*Communication* - per Epstein (1995), this theory concept requires “forms of school-to-home and home-to-school communications” (p. 16). Examples include conferences, memos, information packets and regular communication such as phone calls and emails.

*Decision-making* - this process requires programs to “include parents in school decisions” (Epstein, 1995, p. 18). For example, parents may be invited to serve on school committees.

*Hybrid homeschool program* - a formal education program providing primary and secondary school instruction in a physical location up to four days a week with the remaining weekdays requiring instruction at home from a guardian (Wearne, 2017).

*Homeschool day routine* - the routines of hybrid homeschool program students while *learning at home* (see *learning at home* definition below).

*Learning at home* - implementation of parents guiding students at home on schoolwork and “curriculum-related activities” (Epstein, 1995, p. 17). Epstein (1995) also recommends this process include a “regular schedule of homework that requires students to discuss and interact with families on what they are learning in class” (p. 17).

*Support for parents* - assistance provided to parents to increase their understanding of the instruction at home and at school (Epstein, 1986). This assistance may involve workshops or webinars for parents.

## **Chapter II**

### **LITERATURE REVIEW**

#### **History of Homeschooling**

“Education” in the modern United States is often implied to mean instruction given at a brick-and-mortar school with degreed instructors. A closer review of the history of education in the US demonstrates the root of education was in the home (Cai, Reeve & Robinson, 2002; Dwyer & Peter, 2019). Historically, parents in the United States led education from home during colonial times before schools were built in their nearby towns. Compulsory schooling laws in the nineteenth century led to a significant decline in traditional home education. Prior to 1900, only 32 states had compulsory schooling laws but by 1918 all states had adopted a compulsory attendance law (Stambler, 1968). Thus, school attendance became the standard for education in the US.

Dwyer and Peter (2019) define homeschooling as “parent-directed learning in the home that substitutes, partially or completely, for attendance at a regular school” (p. 3). The literature refers to “modern homeschooling” as a movement that began in the late 1970’s with pioneers such as Dr. Raymond Moore and John Holt (Cochran, 1999; Coleman, 2014; Heuer & Donovan, 2017). Interestingly, Dr. Moore advocated for a Christian homeschool approach and Holt advocated for a secular homeschool approach. Both men promoted home education as a means of a better learning environment than the public school system.

The two factions that are attributed with initiating modern homeschooling are commonly viewed as conservative, religious homeschool families and secular, liberal unschoolers (Coleman, 2014). John Holt, founder of the secular homeschool movement, originally petitioned for radical school reform with his book, *How Children Fail* in 1964 (Cochran, 1999). With the publication of eight additional books after his first, Holt became more disillusioned with teaching methods in the school system and the constraints of “modern childhood” as a barrier to learning (Cochran, 1999, para. 14). Ultimately, he abandoned the idea of school reform stating, “My concern is not to improve ‘education’ but to do away with it, to end the ugly and antihuman business of people-shaping and let people shape themselves.” (Holt, 1976, as cited in Cochran, 1999, para. 14). He helped to develop and promote the concept of “deschooling” which was essentially learning outside of the confines of school (Cochran, 1999, para. 12). Holt published a newsletter in 1977 called *Growing Without Schooling* that inspired many homeschool families to educate their children at home in a secular, child-led fashion without a traditional curriculum.

Dr. Raymond Moore spawned the movement for religious homeschooling after originally advocating for delaying the compulsory age of attendance (Heuer & Donovan, 2017). Dr. Moore wrote a research article in opposition to a California proposal to reduce the compulsory age of attendance to less than three years old. Moore was strongly opposed to school attendance prior to age 8. Dr. Moore and his wife decided to homeschool their own children, likely as a means of delaying school attendance (Coleman, 2014). As an early homeschooling family, they contributed to Holt’s newsletter *Growing Without Schooling*. Their Christian perspective on homeschooling

emerged when Dr. Moore and his wife appeared on a popular Christian radio show, *Focus on the Family*. Christian families who did not prefer the secularism of public schools and were unable to attend private schools appreciated the new idea of possibly teaching their children at home.

### **Laws Related to Home Education**

Homeschooling was illegal in some states prior to 1993 (Heuer & Donovan, 2017). Court decisions in the second half of the 20th century determined there was no “constitutional protection for homeschooling” (Raley, 2017, p. 64). Without clear federal guidelines, legal authority for homeschooling fell to the individual states. Georgia enacted a homeschooling law in 1984 to allow for home education under specific provisions (Coalition for Responsible Home Education, 2020). As stated by the Coalition for Responsible Home Education (2020), these provisions required parents to:

1. Provide school officials with a declaration of their intent to homeschool.
2. Provide a list of the names and ages of all students taught in that home school.
3. Hold at least a high school diploma or GED if they teach their own children—they were not allowed to teach children besides their own—or employ a tutor with a baccalaureate degree.
4. Include at least these subjects: reading, language arts, mathematics, social studies, and science.
5. School the children for 180 days, 4.5 hours per day, each year.
6. Keep and submit attendance records monthly.
7. Take nationally standardized tests once every three years.

8. Write and keep an annual progress report with individualized assessments for each student. (Coalition for Responsible Home Education, 2020)

The provisions have been modified slightly over the years to less stringent requirements. Attendance records are no longer required to be submitted monthly (GA DOE, 2019).

### **Homeschool Sociological Categories**

Dr. Jane Van Galen (1988) proposed an initial sociological categorization of homeschool families. Through immersing herself in the homeschool community and following groups of homeschool families at meetings, Van Galen observed over 20 families and interviewed 16 families in a southeastern state. The homeschool families consisted mostly of self-identified "conservative Christians." Approximately half of the children from these families had never attended a formal school while the remaining children had been homeschooled after withdrawing from a formal institution. Van Galen's research ultimately led her to publish two main sociological categories of homeschool families: *idealogues* and *pedagogues*. Van Galen attempted to use these broad categories to describe a theme of religious *idealogues* who desire the family to be at the center of society and child-centered *pedagogues*. Van Galen's *idealogues* opposed the ideals being taught in a formal school. The *pedagogues* were not opposed to the content but disliked the way instruction occurred at a formal school. *Pedagogues* viewed the method of teaching in school to be "inept" so they took over the teaching at home (Van Galen, 1988, p. 55).

Jennifer Lois (2013) interviewed 24 homeschool families in 2002 to provide another detailed sociological perspective of homeschool families. Lois described

homeschool mothers as “first choice” and “second choice” homeschoolers (Lois, 2013, p. 47). The first-choice homeschool mothers (n = 19) decided to homeschool primarily as a lifestyle choice. The second-choice homeschool mothers (n = 5) homeschool as an alternative to an unsatisfactory school environment and not because it is a lifestyle they preferred. Lois (2013) recognized her classification system appeared to contradict the classic sociological groups at times. For example, all idealogues would expect to fall into her “first choice” category, and yet she discovered some idealogues had not chosen homeschooling as a first choice and were technically second-choicers. Lois (2013) also noted an unexpected group of second-choice families who were pedagogues.

The importance of these sociological groups is noted in Wearne’s (2017) research on hybrid homeschool families. Some of the families (8%) preferred a full-time private school yet stated they could not afford it. This group of families would represent a second-choice homeschool category as described by Lois (2013). Based on these similarities, the motivations indicating sociological categories for homeschooling would appear to be consistent with those of hybrid homeschool families.

### **Variations in Homeschooling**

While the modern homeschool movement in the 1970’s was born out of a desire to remove children from the standard classroom, homeschooling in the twenty-first century appears to utilize more classroom resources (Cheng & Hamlin, 2022). Parents who choose to homeschool are supplementing their home instruction with learning opportunities outside of the home such as tutors, online classes, homeschool cooperatives, university courses, and hybrid homeschool programs. A homeschool cooperative is a similar concept to hybrid homeschooling given that both groups

essentially involve homeschool students coming together for classes. The main difference between the two is that a hybrid homeschool program is less parent-directed in the classroom. As per Cheng & Hamlin (2022), a homeschool cooperative is “where families pool expertise and resources to deliver classes to small groups of homeschooled children” (p. 5). A cooperative is primarily run by parents whereas a hybrid homeschool program could look more similar to a private school.

### **History of Hybrid Homeschooling**

Hybrid homeschool programs have existed and grown in popularity for more than 25 years, yet there is limited research regarding this phenomenon (Brobst, 2013; Herndon, 2019; Wearne, 2016, 2017, 2019a, 2019b, 2020). As Wearne’s (2016) definition of hybrid homeschools implies, hybrid homeschool programs have a range of days and characteristics. All require an increased amount of parental involvement, but the range of hybrid homeschool program characteristics may result in a higher level of parental involvement when comparing one hybrid homeschool program to another. This dissertation primarily addresses the problem of unknown Georgia hybrid homeschool student academic outcomes in terms of hybrid homeschool program characteristics.

A detailed history of hybrid homeschool programs is unpublished in the literature. Gaither (2017) describes an extensive history of homeschooling in the US, yet includes only a small portion of his book on the hybridization of homeschooling in recent years. According to Gaither (2017), hybrids “blend elements of formal schooling into the usual pattern of a mother teaching her own biological children at home” (p. 264). Lyon (2016) claims one of the first descriptions of a hybrid homeschool program was described in the literature by Allahyari in 2012. Allahyari (2012) provided an example of a public school

in New Mexico that reached out to the homeschool community by offering half-day instruction. Wearne (2016) published the first research describing aspects of the hybrid homeschool community across multiple hybrid programs in the state of Georgia.

Even though several hybrid homeschool program websites state their schools started in the 1990's (King's Academy, n.d.; UMSI, 2020b), little proof exists in the literature to suggest exactly when the first hybrid homeschool program opened or how quickly the educational trend spread to other parts of the country. Wearne (2020) states, "Hybrid homeschools are, generally, new schools. The very oldest among them date to the 1990's, with the vast majority much younger than that" (p. 9). At this time, the history of these programs as a collective is unpublished likely due to multiple reasons. The hybrid program concept is much younger than homeschooling. Further research and growth are needed to inspire the publication of an in-depth historical review. There is also a lack of a registry or even consistency in the terminology of hybrid homeschooling. Some scholars prefer the term "flexischooling" when a student is partly homeschooled while also attending classes at a brick-and-mortar school (Kunzman & Gaither, 2020).

One might argue a historical perspective has been muddled by confusion over the term "hybrid." This dissertation focuses only on a specific type of hybrid program where students alternate between traditional school and homeschooling throughout the week. Alternately, some charter schools use the term hybrid to suggest home instruction is online, thereby nearly removing the need for parent instruction (Borup, Graham, & Davies, 2013). This supplementation of online learning with in-class instruction is also gaining popularity as a "hybrid" approach (Means, Toyama, Murphy, Bakia, & Jones, 2009), but it is distinguished from "hybrid homeschooling" based on the online

instructional component (Wearne, 2016). Parent instruction at home is a vital part of the type of programs chosen for this dissertation in testing Epstein's Theory.

### **COVID-19 Pandemic and Homeschooling**

On March 16, 2020, all Georgia schools complied with mandatory building closures during the COVID-19 pandemic (Klosky et al., 2022). Instruction for the remainder of the 2019-2020 school year was done remotely. At that point in time, all students were learning at home and no longer receiving in-person instruction within a school building. This included students in hybrid homeschool programs (Wearne, 2021). In Fall of 2020, some Georgia districts re-opened "utilizing a hybrid model of virtual and in-person modalities" (Klosky et al., 2022, p. 657).

There is an important distinction to make between these temporary public and private pandemic-induced hybrid models and the hybrid homeschool programs described in this study. First, the schools involved in this study did not start as five-day programs and evolve into hybrid learning during the pandemic. A majority of the hybrid homeschool programs surveyed in the National Hybrid Schools Project existed as hybrid models prior to the pandemic (Wearne & Thompson, 2022). Second, a hybrid homeschool program requires parents to implement lesson plans at home with the parent taking on the role of a teacher (Wearne, 2020). The pandemic-induced hybrid models required remote learning with instruction directly administered by the school while learning at home (Klosky et al., 2022). These pandemic-induced hybrid models eventually converted back to in-person instruction as COVID cases declined. Wearne (2021) found that hybrid homeschool program administrators perceived their programs as less affected by the pandemic shutdowns as compared to the five-day conventional

schools. Conventional schools did report significant barriers to remote learning due to the unexpected nature of the mandatory building closures (Klosky et al., 2022).

### **Operations and structure of hybrid homeschool models**

Hybrid homeschool programs are not typical or well-known in the education community (McShane, 2021). Despite continued growth of these programs over the past 30 years, families outside of these programs may be unfamiliar with the concept of hybrid homeschooling. There are few regulations for hybrid homeschool programs in the private sector because most do not fit their state’s definition of a “school” (McShane, 2021; Wearne, 2020). There are charter schools outside of Georgia that fit the definition of hybrid homeschooling and would follow regulations outlined by the school district. Yet most Georgia hybrid programs are independent. Additionally, hybrid homeschool families consider themselves as following a homeschool model rather than attending a formal school model (Wearne, 2020). Freedom from the standard school regulations allows hybrid homeschool programs to be varied in their daily operations.

Attempting to define what a standard Georgia hybrid homeschool day looks like is challenging when so many different hybrid program styles exist. Some programs may operate only one day a week, requiring parents to homeschool for the remaining four days. Other programs may operate four days a week, requiring parents to homeschool only one day. Wearne (2020) describes a portion of these programs as appearing very similar to conventional schools on in-person days. “These students are enrolled in formal institutions, with classmates and teachers, often wear uniforms, follow a curriculum with others, are given grades by teachers, and pay tuition...” (Wearne, 2020, p. 19). Wearne

suggested there is a debate as to whether a structure so similar to conventional school should contain the term homeschooling at all.

Families interviewed by McShane (2021) described assignments designed to be interchangeably done at home or at school so parents at home and teachers in the classroom are following the same daily lesson plans for an entire class. McShane also explains how educators in a hybrid homeschool program partner with the parents to provide the desired curriculum and accountability in a partial homeschool setting. Parents are frequently provided with resources to be a “coteacher” at home. Even though there are clear expectations regarding what the parent and student should be doing on homeschool days, McShane states repeatedly that days learning at home are flexible in terms of schedule. The days learning at school are more structured and involve a teacher, frequently trained educators, leading students in a classroom setting.

How the programs operate often depend on the program characteristics. Variations in hybrid program characteristics will be discussed more extensively later in this chapter.

### **Hybrid homeschool prevalence, demographics, and motivations**

With the absence of a formal registry for hybrid homeschool programs, researchers such as Schafer and Khan (2017) used statistical analyses from the National Household Education Surveys Program to estimate the number of “flexischooled” students. Flexischooling was defined as “an approach involving at least some instruction both at home and at school” (Schafer & Khan, 2017, p. 525). Schafer and Khan (2017) stated the US student population consisted of nearly 4 percent who “received all or part of their schooling at home, an estimated 2 million students in 2012. Of these, about

900,000 were fully homeschooled, while 1.1 million were flexischooled” (p.531). Thus, it is suggested by these statistics that more than half of the reported homeschool population are potentially students of a hybrid homeschool program. This interesting statistic is acknowledged by Kunzman & Gaither (2020),

One statistic that often goes overlooked in the popular conception of homeschooling is the significant number of students whose education includes both institutional schooling and homeschooling. In many cases, for example, students supplement their homeschooling with public or private school classes, or local college coursework. This approach, sometimes called flexischooling, was examined by Schafer and Khan (2017), who found that a majority (55%) of homeschoolers were actually being flexischooled. (p. 260)

Other statistical analyses using the NCES homeschool dataset contradict Schafer & Khan’s (2017) estimation. Redford, Battle & Bielick (2017) stated only 18% of homeschool families surveyed by NCES were students who attended school part-time with over 25 hours per week in a brick-and-mortar institution. The major distinction between Schafer and Khan’s (2017) estimation and Redford, Battle & Bielick’s (2017) is the amount of time spent in the classroom. Schafer and Khan did not specify any number of hours spent homeschooling or in the classroom.

The National Hybrid Schools Survey (Wearne & Thompson, 2022) provided additional insight into hybrid program history and characteristics. With 73 schools surveyed throughout the US, 17 were found to be located in Georgia. Programs surveyed opened as early as 1995, the average reported to be 2012. The average program in the survey had 227 students. A majority of these programs had high school students

attending 2-3 days a week. Also, 39% of schools in the survey had no accreditation or affiliations.

There are no demographics published for the hybrid homeschool population as a whole in the state of Georgia, however, Wearne (2016) published the demographic results of four Georgia hybrid homeschool programs he surveyed. This study consisted of 136 volunteer hybrid program families in Georgia. By surveying hybrid homeschool parents, he was able to compare their demographics and motivations to a similar full-time, traditional tax-credit scholarship study. Wearne (2016) determined most of the hybrid homeschool parents made \$100,000 or more (68.2%), 96.7% were married, 84.4% reported having an undergraduate degree, and 92.2% were White.

The participants in Wearne's (2016) study reported they chose a hybrid program for religious reasons (81.7%), because they desired an improved learning environment (79.4%), and because the school had smaller class sizes (79.4%). Only 19% chose a hybrid program due to inability to afford a full-time private school. Interestingly, many parents did prefer an accredited hybrid program (72.8%), indicating their desire for characteristics similar to full-time private schools. When compared to results of the study with full-time tax credit scholarship private school families, Georgia hybrid families lack diversity, tend to be well-educated, and have a relatively higher income.

Wearne (2017) continued his work with hybrid homeschool parents outside of Georgia in a University-Model Schools (UMS) study. This research produced similar results to Wearne's first study, demonstrating that most participating hybrid families were married (95.7%), White (92.4%), and well-educated (83.7% attained a college degree). Many UMS families also had an income exceeding \$100,000 a year (61.1%). The UMS

parents' motivations for choosing hybrid programs nearly mirrored his previous study. The parents preferred hybrid program's small class sizes (81%), religious aspects (80%), and an improved learning environment (68%). Wearne concluded that UMS parents represented a somewhat more diverse population compared to his previous, smaller study.

A hybrid charter school in California showed even greater diversity than the Georgia and UMS schools (Wearne, 2019a). These California hybrid families also tended to be less wealthy and fewer parents had obtained an undergraduate degree. Their motivations for attending a hybrid program differed as well. The California hybrid families did not place as much emphasis on religion and academics but rather preferred a hybrid setting based on small class sizes and an improved learning environment.

The distinction between the demographics in Wearne's (2016, 2017, 2019a) studies confirms that national hybrid statistics are similar yet not fully applicable to Georgia hybrid homeschool programs. These demographics must still be noted because the small number of academic achievement studies for hybrid homeschool programs focus on programs outside of Georgia.

### **Academic achievement studies for hybrid homeschool students and a mixed homeschool and hybrid homeschool population**

It should be noted that academic achievement in this study is an attempt to indicate whether hybrid homeschool students are successful from a traditional educational perspective. This perspective is a narrow and singular measure but often used for college admissions, thereby making it an important indicator for programs which are college-prep.

Brobst (2014) and Herndon (2019) published the only two studies regarding the academic achievement of hybrid homeschool students. Brobst (2014) studied 90 hybrid homeschool students within University Model Schools in Texas. This study compared the UMS students with a group of traditional private school students who were predominantly White. The UMS group was 2.22% African American while the traditional high school group was 1.94% African-American, 1.94% Pacific-Islander, and 96.77% White. SAT composite scores were 32.081 points higher (95% confidence intervals from -63.665 to -1.937) for the UMS students when compared to students who attended five-day Christian schools. Alternately, the UMS students did not perform better on the SAT Writing section ( $\beta = -.046$ ). Brobst attempted to compare ACT scores as well but her results were inconclusive. Ultimately, her research suggested the UMS group scored better than the traditional students on the SAT composite test only.

The only other research to evaluate academic achievement of hybrid homeschool students was published in 2019 by Herndon. Herndon (2019) evaluated ACT scores of UMS students when compared to other traditional school groups. Per his research, UMS students scored higher on the ACT score than all other groups. The UMS mean ACT score was 26.45 which was significantly higher than mean of all ACT test takers in 2017.

A review of pertinent homeschool studies over the past 20 years reveal some which likely included hybrid homeschool students. These studies are relevant to understanding the hybrid homeschool population because hybrid students often classify themselves as homeschool students (Wearne 2020), thereby inadvertently being included in some of the homeschool studies. Inclusionary wording examples in these studies to suggest hybrid students were involved include “students who...identified themselves as

being homeschooled” (Ray & Eagleson, 2008, p. 8) and “7.7% of the respondents were enrolled in a full-service curriculum program” (Rudner, 1999, p. 12). Hybrid homeschool students also meet these criteria. Many also include a definition of academic achievement based on how well the students performed on standardized tests.

The first homeschool study which may also include hybrid homeschool students was published in *Academic Leadership: The Online Journal* (Ray & Eagleson, 2008). The purpose of this large-scale study (n = 6,170) was to determine the achievement of homeschool students on the SAT based on state homeschool regulations. Each state has a varying level of regulation for homeschool families, ranging from low to high. Hybrid homeschool students sometimes need to register as a homeschool student in states with a moderate or high level of regulation (Wixom, 2015). The average verbal SAT score for all participants in this study was found to be 582.4, and the average math score was 538 (Ray & Eagleson, 2008). While they did not seek to compare results of the homeschool population with the average student, the scores are notably higher based on the national averages of 502 verbal and 515 mathematics in 2007-2008 (NCES, 2019). Ray and Eagleson (2008), therefore, provide some evidence of prior academic achievement studies with both homeschool students and possibly hybrid homeschool students combined.

A similar, yet smaller, study reviewing only the ACT mathematics scores might have also included hybrid homeschool students if the students marked themselves as homeschooled (Qaqish, 2007). Academic achievement, according to Qaqish (2007), was determined by standardized test scores, similar to Ray and Eagleson (2008). Qaqish (2007) found non-homeschooled students correctly answered approximately two more

questions out of 60 compared to homeschool students (n = 1,477). He concluded homeschool students might have a variable arithmetic instructional method which accounts for the differences in math scores.

Another study which may represent some of the hybrid homeschool population, examined academic achievement through the standardized test scores for 20,760 homeschool students (Rudner, 1999). Rudner (1999) noted that a small percentage of his homeschool participants used a full-service curriculum. The results of Rudner's research demonstrated significantly higher standardized test scores for homeschool students. The average homeschool performance was in the 70th-80th percentile. By comparison, students who attended public or private school had a standardized test average of 65th-75th percentile. The students whose parents chose a full-service curriculum had no significant difference in test scores compared to the other homeschool students ( $F$  enrollment = .24;  $df = 1,9750$ ). Students who attend hybrid homeschool programs may fall into this full-service curriculum category, and thus it may be implied their scores could be similar to other homeschool students.

### **Hybrid homeschool program characteristics**

While there is little known about the consistent features of hybrid homeschool programs, University Model Schools represent a growing chain of characteristically similar hybrid homeschool programs throughout the United States (Herndon, 2019, Wearne, 2017, 2020). Research on University Model Schools show improved academic achievement and college readiness (Brobst, 2013; Herndon, 2019), yet University Model Schools appear to represent less than 1% of the hybrid homeschool programs in the state of Georgia. As the current literature is limited in describing all hybrid homeschool

programs in Georgia, both University Model and non-University Model (Wearne, 2016), this study builds on the knowledge of hybrid homeschooling as a whole instead of focusing only on University Model Schools.

Hybrid program characteristics chosen for this study were based on a parental involvement theory from Joyce Epstein (1995). Epstein's (1995) Model of Parental Involvement theorized students are more successful when parents and schools collaborate across six levels, four of which were tested in this hybrid homeschool program inquiry. These four levels are parenting, communication, learning at home, and decision-making, each of which links directly to questions on the survey. Ultimately, the varying levels of hybrid homeschool program characteristics may hinder or support parental involvement. As increased parental involvement has been well-established in the literature as improving student outcomes (Walker, Wilkins, Dallaire, Sandler & Hoover-Dempsey, 2005), the hybrid homeschool program characteristics that support higher levels of parental involvement would theoretically improve student standardized test scores.

One goal of this dissertation is to identify predictors of academic achievement for hybrid homeschool students while comparing hybrid homeschool program characteristics. A review of the literature for these characteristics and how they may pertain to student academic achievement provides insight for several possible outcomes.

### ***Number of days on-site***

Wearne's (2019) study showed a variation of program characteristics just between four hybrid homeschool programs he studied. "Three of the four schools involved follow a weekly structure of two or three days on campus (depending on grade level), and the

rest of the week at home. (The fourth school has several campuses; some campuses follow this weekly schedule, while others have either more or fewer days on campus).” (p.188). It is clear the number of classroom days provided by hybrid programs are quite inconsistent. Some programs meet for one day a week while others meet four days (Wearne, 2020). Few studies have specifically correlated the number of days at school with academic achievement. Some public school districts recently reduced their number of days in the classroom to only four days a week, thereby allowing some researchers to review outcomes from fewer days of classroom instruction (Anderson & Walker, 2015). Anderson and Walker (2015) determined there were improvements in standardized test scores with a four-day week in Colorado. Other studies (Lefly & Penn, 2009; Hewitt & Denny, 2011) have shown no significant improvements or decline in test scores with a four-day week.

### ***Accreditation***

Accreditation is another hybrid homeschool program characteristic reviewed in this dissertation. Accreditation of private schools is not required in the state of Georgia (US DOE, 2016) and not all Georgia hybrid programs are accredited (Wearne, 2020). Accreditation was highly valued by the parents surveyed by Wearne (2016) when choosing a Georgia hybrid homeschool program. There are no current studies linking school accreditation to improved standardized test scores. However, a small sample of hybrid and traditional program websites claim their accreditation status results in higher SAT scores (Foundation Christian Academy, n.d.; Veritas Classical Academy, n.d.).

Possible reasons for parents seeking out accredited hybrid homeschool programs may include easier admission into colleges (Evans, 2005), eligibility for state

scholarships (Wearne, 2020), and easier transferability of school credits to other schools (Forsyth County Schools, n.d.). According to the Forsyth County Schools website, transfer from an accredited home study program or nontraditional educational center, as many hybrid homeschool programs are classified (Wearne, 2020), requires a review of the course materials and test scores. A hybrid homeschool program often maintains all of the student's records (Newton, 2020) making for an easier transition to other academic settings as needed. Yet, some hybrid homeschool programs choose not to seek accreditation. Homeschool families may purposely choose a non-accredited program for personal and financial reasons (GHEA, 2020).

### ***Communication***

Communication, a hybrid homeschool program characteristic chosen for this study, varies among hybrid programs. According to a UMS study, UMS parents “have a responsibility to establish and sustain pathways for communication” (Martin, 2017, p.98). Other non-UMS hybrid homeschool programs reflect the need for strong communication, not just from the teacher but also from the parent who takes over as teacher on homeschool days. Coastal Christian Academy (n.d.) states directly on their website, “In the hybrid program, parents communicate closely with their child’s teacher and receive lesson plans for their home days.” (para. 2).

While expectations for parent-teacher communication exist in the hybrid homeschool setting, Martin (2017) reported parents perceived communication in UMS schools were sometimes lacking. Walters and Baker (2020) note the shared responsibility between both parents and teacher in the hybrid format based on the alternating environments. Walters and Baker (2020) state:

Communication is the first step in all educational decisions in this model. In fact, teachers and parents work from the same lesson plans, picking up where the other left off the day before. Parents and teachers work together to teach the same concept and often continue lessons that were left unfinished. A strong communication and collaboration is therefore necessary in order for this model to work. (p. 494-495)

Several recent studies support increased academic achievement when parent-teacher communication is increased through technology such as text messages and email (Bergman & Chan, 2017; Kraft & Rogers, 2015). Bergman and Chan (2017) studied text messaging reminders sent to parents regarding academic progress and found this increase in communication "reduced course failures by 38%" (p. 1). Kraft and Rogers (2015) found a significant reduction in course dropouts when parents were sent weekly student updates from the teachers, thereby prompting parent-student interactions for individual improvement. Hybrid homeschool programs often implement an internet-based shared lesson plan and communicate with parents electronically (Wearne, 2020).

### ***Parental involvement***

The involvement of parents in decision-making was identified by Epstein (1995) as important in the success of students. Hybrid homeschool programs appear to include this in variable amounts (Cornerstone Prep, n.d.; Wearne, 2020). Parental involvement is a topic that has been researched and largely supported for many years. Recent studies have both refuted and supported the theory of successful education as parental involvement increases (Goodall & Montgomery, 2014; Khanh & Rush, 2016). Huat See and Gorard (2015) describe a review containing greater than 1,000 studies which

investigated student attainment outcomes. The analysis determined parental involvement a success despite varying definitions. The studies included any strategy providing parent and child educational interaction.

When educational activities incorporate parent ownership, as one might expect to find in a hybrid homeschool program, the involvement becomes engagement (Goodall & Montgomery, 2014). Goodall and Montgomery (2014) described a model for parental engagement which includes “parental involvement with the school” (p.402), “parental involvement with schooling” (p.404), and “parental engagement with children’s learning” (p.405). At each level, the parent is included in their child’s education to promote successful academic outcomes for their child.

### ***Parental support from the program***

Given that partnership between home and school is highly valued in a hybrid homeschool program, it is no surprise these programs have increased parental support. UMS programs are expected to provide training for parents to assist them on homeschool days (UMSI, 2020a). Per Martin's (2017) study, one hybrid she studied required a six-hour parent orientation at the start of the school year.

Public school systems also highly value parent training and support (Mapp & Kuttner, 2013). Parent workshops are provided publicly in several states to train parents to empower other parents in their involvement at school. These types of parental training programs were prompted by a Supreme Court ruling in 2003 (Henderson, 2004). The Abbott Mandates called for parent training to promote parent involvement both at home and at school. Henderson and Berla (1994) published a review of 66 studies reflecting the importance of families in school. Per their review, "Major findings indicate that the

family makes critical contributions to student achievement from the earliest childhood years through high school, and efforts to improve children's outcomes are much more effective when the family is actively involved." (Henderson and Berla, 1994, p. 1).

### **Homeschool factors considered**

#### ***Parental assistance***

Studies have shown successful education as parental involvement increases (Goodall & Montgomery, 2014; Khanh & Rush, 2016). Parental involvement in a student's education may include many student and parent interaction levels. Choi, Chang, Kim, and Reio (2015) used a complex definition of parental involvement including a broad spectrum of activities. Their review included 8,000 high school students experiencing various parental interactions. Some studies have demonstrated parental involvement boosts future student college attendance (Khanh & Rush, 2016). The involvement described was as simple as the expected intent to attend college. First-generation students were studied, finding parents who had little or no college experience could provide encouragement and support. Despite lacking academic knowledge, parent expectations made a significant, positive impact. A separate study, though, showed negative consequences when parents were not well educated (Choy, 2001). Parental engagement at the school level as well as parental control of homework may also not be beneficial for academic achievement according to a review of 75 studies between 2003 and 2017 (Boonk, Gijsselaers, Ritzen & Brand-Gruwel, 2018).

It is a general assumption that homeschooling requires parents to assist their children in some form. Goodall & Montgomery (2014) reviewed many positive studies and published a parental engagement recommendation. Parental engagement may be

alternately viewed as “parental assistance” as it requires the parents to direct the learning. Thus, parent-directed education becomes parental engagement. As the parent directs the child’s education, they may also spend a significant amount of time assisting the child with their homeschool work. For the purpose of this research, parental assistance was examined in both homeschool and hybrid homeschool students to determine the level of parental assistance and how it affects the standardized test scores of the student.

### ***Homeschool routines***

All hybrid homeschool students spend a portion of their time learning at home, regardless of the number of days a week they are enrolled in school. Wearne (2020) noted most hybrid homeschool families identify themselves as homeschool families. Understanding the effect of homeschool routines on hybrid homeschool student academic achievement is one goal of this inquiry. No known studies have reviewed homeschool routines of hybrid homeschool families but Martin-Chang et al. (2011) reviewed correlations between academic achievement and homeschool routines for self-identified homeschool families. Martin-Chang et al. (2011) demonstrated homeschool students with a structured homeschool day had improved standardized test scores compared to matched public-school students ( $n = 74$ ,  $p = .015$ ). Homeschool students in this study who lacked a structured homeschool routine scored worse than public-school students. Thomas (2016) researched homeschool routines exclusively. His research revealed 73% of homeschool families spent four hours or less on homeschool work. Thomas's (2016) survey participants reported widely variable structure in their homeschool routines, some with very strict schedules and others with a flexible or absent schedule.

## **Chapter III**

### **METHODOLOGY**

In this chapter, the methodology for the proposed study will be reported. The research design will be identified along with independent and dependent variables. The population and sampling procedures will be identified. The survey instruments will be described and justified for use in the current study. The data collection procedures for the study will be delineated. The chapter concludes with statistical considerations and assumptions as well as a summary of the chapter.

#### **Research Questions**

The following research questions guided the study:

**Research Question 1:** Is there a significant difference between 11th and 12th Georgia students in homeschool, hybrid homeschool, public high school, and private high school on SAT and ACT scores?

**Research Question 2:** Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of set homeschool day schedules on SAT and ACT scores?

**Research Question 3:** Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of parental assistance on SAT and ACT scores?

**Research Question 4:** Are Georgia hybrid homeschool program characteristics (program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the program; parent-teacher communication; use of set schedule; and levels of parental assistance) significant predictors of Georgia hybrid homeschool students' performances on the SAT and ACT?

### **Research Design**

The current study utilized a nonexperimental survey design with group comparisons and correlational methods to examine the relationship between hybrid homeschool program characteristics and standardized test scores. A nonexperimental correlational design allowed the researcher to observe variables that naturally occur in groups (Price et al., 2022). Research using a nonexperimental design requires no manipulation of the variables but rather describes relationships between variables. This study employed quantitative methods to establish the relationships between variables or explain causality as implemented with steps that guide the research process (Howell, 2013). Quantitative methods incorporate the collection and analysis of numerical data to describe, explain, and establish relationships between the variables of interest (Creswell, 2018). All the data were numerically measurable through the use of close-ended multiple-choice responses on a self-report survey. Therefore, a quantitative method was deemed appropriate for the research.

Multiple independent variables were involved in this inquiry. The recurring independent variable used for each research question is method of schooling. Method of schooling is a nominal-level independent variable, with four possible categories:

homeschooling, hybrid homeschooling, public schooling, and private schooling. Levels of homeschooling were a nominal-level variable, with five possibilities: 20%, 40%, 60%, 80%, and 100%. The use of a specific schedule for homeschooling was a nominal level variable with an initial response option of Yes or No and then a scale of responses including no, not strict, little strict, strict, and very strict. Level of parental assistance at home was an ordinal-level variable consisting of three possibilities: < 1 hour, 1-3 hours, or > 3 hours. Program accreditation was a nominal-level variable consisting of Yes or No. Involvement of parents in decision-making, parent-teacher communication, and parental support from the program were ordinal-level variables with a standard Likert scale. Number of days on-site was an interval-level variable, ranging from 1 to 4. The dependent variable for all questions was standardized test scores which were measured on an interval scale. The ACT score ranges from 0-36 and the SAT score ranges from 400-1600. Table 2 correlates the variables with each research question.

**Table 2***Variables and Level of Measurement*

Variable	Research Question	Independent or Dependent	Level of measurement	Categories or Range of Scores
Method of schooling	1, 2, 3	Independent	Nominal	Homeschool, hybrid, public, private
Levels of homeschooling	2, 3, 4	Independent	Nominal	20%, 40%, 60%, 80%, 100%
Use of set schedule	2, 4	Independent	Ordinal	No, not strict, little strict, strict, very strict
Levels of parental assistance at home	3, 4	Independent	Ordinal	< 1 hour, 1-3 hours, > 3 hours
Program accreditation	4	Independent	Nominal	Yes or No
Number of days on-site	4	Independent	Interval	1-4
Involvement of parents in decision making	4	Independent	Ordinal	Likert
Parental support from the program	4	Independent	Ordinal	Likert
Parent-teacher communication	4	Independent	Ordinal	Likert
SAT and ACT scores	1, 2, 3, 4	Dependent	Interval	SAT 400-1600 ACT 1-36

## **Population**

The hybrid homeschool population is challenging to estimate given the lack of a registry for homeschoolers (Coalition for Responsible Home Education, 2017). Some states require homeschool students to register, but most states do not report the statistics (Coalition for Responsible Home Education, 2017). Despite the lack of hybrid student statistics, the National Center for Education Statistics (NCES) appears to include hybrid program students in their estimation of homeschool students (Grady, 2017). Their definition of a homeschool student included any student who received home education with up to 25 hours a week of school outside the home. They estimated there were 1,689,726 children homeschooled in 2016. Eighteen percent of homeschool families surveyed by NCES had students who attended school part-time with over 25 hours per week in a brick-and-mortar institution (Redford, Battle & Bielick, 2017).

The sample of interest consisted of hybrid homeschool programs in the state of Georgia, thereby requiring the estimation of hybrid homeschool students only in this state. According to the International Center for Home Education Research (2023), Georgia reported 66,149 registered homeschool students in 2018. Using the national statistic of 18% of homeschool students enrolled part-time (Redford, Battle & Bielick, 2017), Georgia is estimated to have 11,906 hybrid homeschool students. The limited research available regarding hybrid homeschool programs in Georgia provided evidence of approximately 700 families contained within only four programs (Wearne, 2016). As of 2022, at least 63 hybrid homeschool programs had been identified through a basic internet search and advertising. The population numbers are not published, and there is

no attempt to distinguish the hybrid population from the homeschool population. Not all hybrid homeschool families register with the state as homeschoolers.

### **Selection Procedure**

This study accessed hybrid homeschool programs as identified in an Internet search of “hybrid schools” within Georgia. A preliminary search discovered 63 hybrid schools. The criteria for selection included any program which offered on-site instruction 1-4 days a week, expected the parents to homeschool their children on the remaining days, and had 11th and 12th-grade students. An informative email was sent to all 63 hybrid program administrators describing the study provided the programs with an option to participate. Those who agreed to participate were emailed a survey link. Additionally, a link was posted to private social media groups and emailed to groups of homeschool and hybrid homeschoolers. A survey response of at least 249 respondents with a 15% response rate required sending the survey to 1,973 hybrid homeschool parents. Ideally the goal was to reach 400 respondents to ensure the sample represents the population.

### **Instrumentation**

The study instruments were standardized tests and an online survey. The limited homeschool studies reviewing college success suggest standardized test scores (particularly the SAT) predict first-year college GPA more significantly than high school GPA (Yu, Sackett, Kuncel, 2016). The standardized tests, the ACT and SAT, are achievement tests that more than 2.8 million graduating seniors took in 2021 to determine college readiness (ACT, 2021; College Board, 2022). Both the ACT and SAT are administered to millions of students throughout the United States yearly (ACT, 2018; College Board, 2022) and have been researched for over 50 years (Ferguson & Maxey,

1976; Lawrence, Rigol, Essen, & Jackson, 2003; Lins, Abell, & Hutchins, 1966). The tests are employed by state departments and school districts to assess high school knowledge (Allensworth & Clark, 2020; Cho, Steedle, Woodruff, & Colton, 2020). National statistics for the SAT and ACT are readily available and often publicized in each state (Nayar, 2015).

The requirement for standardized testing during college admissions declined in 2020 as many colleges became test-optional during the COVID-19 Pandemic (Jaschik, 2022; Rosinger, 2020). Standardized testing remains a vital component of state-sponsored scholarships such as HOPE (Helping Outstanding Pupils Educationally) and Zell Miller (Georgia Student Finance Commission, 2022). All students, including public, private, homeschool, and hybrid homeschool students, must take the SAT or ACT in order to qualify for these popular scholarships. Homeschool students are conceivably more motivated to take standardized tests multiple times for HOPE and Zell Miller given the higher ACT and SAT scores required by homeschool students to obtain the scholarships immediately upon graduation. Homeschool students must score 3 points higher on the ACT and 140 points higher on the SAT to qualify for Zell Miller as a high school senior.

Standardized tests should ideally be both valid and reliable. Validity is determined by how well the content measures the intended variables (Price et al. 2022). Examples of types of validity include content validity, concurrent validity, and predictive validity. The SAT and ACT are often reviewed for predictive validity as these tests are used for college admissions (Cho, et al., 2020; Huh & Huang, 2016; Marini, Westrick, & Shaw, 2021; Sawyer, 2013; Marini et al., 2019). A positive correlation when reviewing

predictive validity suggests the test predicts success for college measures such as first-year college GPA (Cho et al., 2020; Huh & Huang, 2016; Sawyer, 2013). Reliability refers to the consistency of the test questions (College Board, 2015; Powers, Li, Suh, & Harris, 2016). A reliable test has a correlation coefficient of  $+0.80$  or greater (Price et al., 2022). When the test is taken repeatedly and students score consistently on the individual questions and sections, this indicates high reliability.

The ACT was created using the assistance of subject-matter experts, a national survey of standards frameworks, and data from prior testing (ACT, 2022). The test consists of four categories: English, mathematics, reading, and science (ACT, 2018). These sections were chosen by the developers of the ACT because the sections are core subjects of the standard high school (ACT, 2022). The English section contains 75 items, is administered in 45 minutes, and tests the student's ability to employ conventions of standard English. The mathematics section contains 60 items, is administered in 60 minutes, and tests the student's ability to solve problems one might find in a high school Algebra, Geometry, and Statistics class. The Reading section contains 40 items, is administered in 35 minutes, and tests a student's ability to understand a source text. The Science section contains 40 items, is administered in 35 minutes, and tests a student's knowledge and reasoning of natural sciences. Each section is calculated for correct responses and a final score for the individual sections are converted to a scale score from 1-36. A composite score is reported which represents the average of all sections. For the purposes of this research inquiry, the ACT composite score was treated as a continuous variable, with possible scores ranging from 1-36.

The predictive validity of the ACT is cited by multiple studies which suggest a positive correlation to first-year college grade point average (Cho et al., 2020; Huh & Huang, 2016; Sawyer, 2013). Several studies reported correlation coefficients between 0.44 and 0.51 (Allen & Robbins, 2010; Sawyer, 2013). Cho et al. (2020) researched the predictive validity of low ACT scores and reported a correlation coefficient of 0.31. ACT reviewed composite scores and FYGPA for college students across 50 colleges and reported an adjusted correlation coefficient of 0.51 (ACT, 2022).

The ACT Technical Manual reports a single-test administration set of reliability scores for each section (ACT, 2022). Using Cronbach's alpha, the average reliability score for the English section was reportedly 0.94, the Mathematics section was 0.92, the Reading section was 0.88, and the Science section was 0.87. Reliability scores reported separately by ACT researchers who analyzed 12 forms of the ACT in 2015 suggest the testing subcategories average from 0.35 to 0.86 (Powers, Li, Suh, & Harris, 2016). The reliability scores below 0.80 on individual subsections account for 13 out of 17 subsections yet the number of questions in those subsections are small.

The SAT was created with the assistance of classroom teachers and content experts. The College Board states the subjects were chosen because, "the best available evidence indicated...reading, writing, language, and mathematics for readiness...and success in postsecondary education (College Board, 2017, p.6). The test sections are titled Reading, Writing and Language, and Math. The Reading section is 52 questions and allows a student to finish within 65 minutes. This section requires the student to read and analyze passages. The Writing and Language section is 44 questions and has a time limit of 35 minutes. This section requires the student to employ Standard English

Conventions and identify Expression of Ideas. The Math section is 58 questions and has a time limit of 80 minutes. The Math section tests the student's ability to solve problems using algebra, data analysis, and advanced math. The SAT also contains an optional 50-minute essay portion. SAT scoring is dependent on the section. The Math section scores range from 200 to 800 while the Reading and Writing and Language sections range from 400 to 1600. A total score of 400-1600 is calculated based on the sum of the Math score and Evidence-Based Reading and Writing score (Reading and Writing and Language sections combined). For the purpose of this research inquiry, the SAT score was treated as a continuous variable, with possible scores ranging from 400-1600.

The predictive validity of the newest version of the SAT (2016 to present) was reported by Marini et al. (2019) with a correlation coefficient of .51 between SAT scores and first-year college GPA. A subsequent study of 2018 graduates demonstrated a correlation of .54 between the SAT and first-year college GPA (Marini, Westrick, & Shaw, 2021). The SAT Suite of Assessments Technical Manual (College Board, 2017) outlines their predictive validity pilot study which was used to obtain the initial predictive validity of the newest SAT version. Over 2,000 college freshmen took the new SAT after being admitted to college. The College Board subsequently followed those students to determine their First Year GPA. Their results demonstrated a correlation of .51 between the Evidence-Based Reading and Writing score and FYGPA. They also reported a correlation of .49 between the Math score and FYGPA.

The reliability coefficients for the SAT questions range from .89 to .94 (College Board, 2015). More specifically, the Reading section reliability coefficient was reported as 0.89, the Writing section was reported as 0.89, and the Math section was reported as

0.90 (College Board, 2017). The entire Evidence-Based Reading and Writing reliability score was 0.94. Table 3 compares the characteristics of the SAT and ACT.

**Table 3**

*Characteristics of ACT and SAT*

	ACT	SAT
Number of questions	215	154
Sections	English Mathematics Reading Science	Reading Writing and Language Math Part 1 Math Part 2
Score Range	1-36	400-1600
Predictive Validity	0.31-0.51	0.49-0.51
Reliability	0.35-0.86	0.89-0.94

A concordance table provided on the ACT website permits the ACT score to be converted to an equivalent SAT score (ACT, 2018). The Math portion of both tests exhibits concordance with a correlation of 0.89 (College Board, 2015). The SAT Reading, Writing, and Language portions of the SAT exhibit concordance with the ACT Reading and English portions based on a correlation of 0.88. With both ACT and SAT scores comprising the final data point of the standardized test score, the analysis of this inquiry's results required a conversion of the ACT scores to an SAT score.

The other instrument, an online survey, contained customized survey questions. The uniqueness of this study negates the ability to use any full existing survey. All of the questions were newly designed. The survey questions were grouped into categories based on each research question. The question categories aligned with the first research

question were the types of schooling. The second research question aligned with survey questions regarding levels of homeschooling and homeschool schedules. The survey question categories for the third research question included levels of parental assistance. The fourth research question determined the survey categories of parental program support, parent-teacher communication, program accreditation, and instruction at school. All research questions led to the final survey category regarding standardized testing. This ultimately resulted in the parent reporting their child's SAT or ACT scores.

The survey was tested for validity and reliability through multiple steps. First, the survey underwent a validation study. The survey questions were reviewed by five hybrid homeschool experts to determine content validation. Their feedback was used to adjust the questions for accuracy in a hybrid setting and to ensure there was clear verbiage for the target population. Their recommendations guided edits and changes to questions for optimal clarity and relevance.

A pilot test consisting of approximately 25 hybrid homeschool families was conducted and the results analyzed for reliability using Cronbach's alpha. A follow up survey requesting feedback for the pilot test questions was distributed. Each item was evaluated by the families performing the pilot test after they completed the survey. Recommended changes to the final survey were again reviewed by the experts.

### **Data Collection**

All research must be approved by the Institutional Review Board (IRB). With meticulous data collection expected, the survey instrument (located in Appendix A) was inspected by the IRB. Before permission was granted to use the survey instrument, the researcher and IRB determined any potential risks to the survey participants. The IRB

approval is found in Appendix B. Obtaining the answers to this hybrid homeschool inquiry required a survey protocol with procedures designed to protect the identity of all participants. An email to administrators of Georgia hybrid homeschool programs (located in Appendix C) provided a Parent Survey Letter (located in Appendix D) with an invitation link to the survey. No identifiers were collected in the survey, thereby allowing for respondent anonymity. Dissemination of the survey through Qualtrics provided respondents easy access through a web link while protecting the respondents' identity. A brief consent explanation before administration of the survey guaranteed the respondent was allowed to opt in or out of the survey questions prior to entering any information. Participants were screened through survey questions to verify whether they met the criteria for the study.

Through a purposeful selection of groups identified as attending "hybrid schools" within Georgia, the survey was intended to target parents of hybrid homeschool students. After approval from the IRB, survey links were sent to the administrators, which were subsequently sent to the appropriate hybrid homeschool families. The survey was designed to be completed within 10-15 minutes. It was open for responses for up to twelve weeks. Respondents who completed the survey were not contacted for follow-up questions as this would require the collection of their contact information. Some respondents who were disqualified reached out voluntarily to the researcher to provide feedback.

### **Data Analysis**

The raw data was uploaded from Qualtrics into R. The data was first examined to account for nonresponses. Participants that failed to respond to a majority of the survey

(> 25%) were removed from further analysis. Potential outliers were identified through the use of standardized values, or  $z$ -scores. Tabachnick & Fidell (2019) indicates that outliers correspond to  $z$ -scores exceeding  $\pm 3$  standard deviations from the mean. Participants with outlying standardized scores were reviewed and considered for removal from further analysis. Frequencies and percentages were used to summarize the trends in the nominal-level and ordinal-level variables, such as methods of schooling, homeschooling schedule use, levels of parental assistance, program accreditation, involvement of parents in decision-making, parental support from a hybrid homeschool program, and parent-teacher communication. Means and standard deviations were used to examine the trends in the interval-level data, such as number of days on-site at a hybrid homeschool and standardized scores. Bar graphs and histograms were used to visually represent the trends in the data.

### **Research Question 1**

To address research question 1, an ANOVA was planned to be conducted to examine for differences in SAT and ACT scores by type of schooling (homeschool, hybrid homeschool, public high school, and private high school). An ANOVA is appropriate when assessing for differences in a continuous variable between multiple groups (Field, 2013). The independent grouping variable corresponded to type of schooling, with four possibilities – homeschool, hybrid homeschool, public high school, and private high school. The continuous dependent variable corresponded to SAT and ACT scores. The purpose of research question 1 was to establish a baseline for comparison of hybrid homeschool student scores prior to analysis of other variables in this study.

Prior to analysis, the assumptions of normality and homogeneity of variance were assessed along with visualization of the data in bar graphs and histograms. Normality was planned to be tested with a Shapiro-Wilk test, Q-Q plots, and the Jarque-Bera test. A Shapiro-Wilk test compares the test data (SAT and ACT scores) to an empirical bell-shaped distribution (Ghasemi & Zahediasl, 2012). Significance on the Shapiro-Wilk test ( $p < .05$ ) indicates the assumption of normality is not met. The data in the Q-Q plots was visually inspected to verify whether the data follow the normality trend line. The Jarque-Bera test was planned to be conducted to assess whether the skewness and kurtosis statistics significantly deviate from a normal distribution. Significance on the Jarque-Bera test ( $p < .05$ ) indicates the assumption of normality is not met. All normality tests were to be reviewed to make an overall decision of whether normality was present. To assess homogeneity of variance, Levene's test was planned to be utilized. Levene's test verifies whether the spread of the data (SAT and ACT scores) is approximately equal between the groups of the independent variable (type of schooling). Significance on the Levene's test ( $p < .05$ ) indicates the assumption for homogeneity of variance is not met. If homogeneity of variance was not met, data transformation was to be attempted. In the situation that the assumptions of normality and homogeneity of variance were not met, a non-parametric Kruskal-Wallis test was planned to be conducted as a backup test. A Kruskal-Wallis test is appropriate when assessing for differences in a continuous or ordinal level variable between groups, or when the statistical assumptions of an ANOVA are not supported (Pallant, 2020).

The  $F$  test was used to make the overall determination on whether significant differences exist in SAT and ACT scores between types of schooling. Post-hoc analyses

were conducted through the use of Tukey comparisons to determine specifically which type of schooling has higher or lower scores. The Games-Howell procedure was planned if the homogeneity of variance is not met. Statistical significance on the  $F$  test and post-hoc comparisons were evaluated at the generally accepted level,  $\alpha = .05$ . The findings of the  $F$  test, post-hoc Tukey comparisons, and associated  $p$ -values were reported. The means and standard deviations were also reported for SAT and ACT scores by group.

The ANOVAs incorporate the examination of four types of schooling (homeschool, hybrid homeschool, public high school, and private high school). A medium effect size ( $f = 0.25$ ), an alpha of .05, and a power of .80 was to be utilized, although a small effect size may also be acceptable. Applying the above parameters, it was determined 180 participants would be sufficient for the ANOVAs, with approximately 45 ( $180/4$ ) participants in each schooling group.

### **Research Questions 2 and 3**

To address research questions 2 and 3, two factorial ANOVAs were conducted. A factorial ANOVA is appropriate when assessing for differences in a continuous variable between multiple independent variables (Field, 2013). For research question 2, the independent variables correspond to levels of homeschooling and levels of set homeschool day schedules. Levels of homeschooling consist of five groups based on percent of homeschooling: no outside classes = 100% homeschooling, 1 day hybrid program = 80% homeschooling, 2 day hybrid program = 60% homeschooling, 3 day hybrid program = 40%, and 4 day hybrid program = 20%. Levels of set homeschool day schedules consist of two possibilities: yes or no. The dependent variable corresponds to SAT and ACT scores.

For research question 3, the independent variables correspond to levels of homeschooling and levels of parental assistance. Levels of homeschooling consist of five groups based on percent of homeschooling: no outside classes = 100% homeschooling, 1 day hybrid program = 80% homeschooling, 2 day hybrid program = 60% homeschooling, 3 day hybrid program = 40%, and 4 day hybrid program = 20%. Levels of parental assistance consist of three possibilities: < 1 hour, 1-3 hours, > 3 hours. The dependent variable corresponded to SAT and ACT scores.

Similar to research question 1, the assumptions of normality and homogeneity of variance were planned to be tested. Normality was already assessed in the previous research questions through the planned use of a Shapiro-Wilk test, normal Q-Q plots, and the Jarque-Bera test. Levene's tests were planned on the independent variables to assess the homogeneity of variance assumption. If the assumptions were violated, a nonparametric aligned ranks transformation procedure was to be done. The value of  $W$  and the  $p$  value associated with it was to be reported for the Shapiro-Wilk test. The  $X$ -squared value and associated  $p$ -value were to be reported for the Jarque-Bera test. The value of  $F$  with associated  $p$ -value and degrees of freedom were reported for the Levene's test.

For each of the research questions 2 and 3, three  $F$  tests were conducted. For research question 2, an  $F$  test was used to explore for differences in levels of homeschooling, levels of set homeschool day schedules, and the interaction levels of homeschooling/levels of set homeschool day schedules. For research question 3, an  $F$  test was used to explore for differences in levels of homeschooling, levels of parental assistance, and the interaction levels of homeschooling/levels of parental assistance.

Post-hoc analyses were conducted through the use of Tukey comparisons to determine specifically which groups are significantly different. Statistical significance on the  $F$  test and post-hoc comparisons was evaluated at the generally accepted level,  $\alpha = .05$ . The means and standard deviations were also reported for SAT and ACT scores by group. The findings of the  $F$  test, post-hoc Tukey comparisons, and associated  $p$ -values were reported.

The factorial ANOVAs incorporated a 5x2 comparison (levels of homeschooling and levels of set homeschool day schedules) and a 5x3 comparison (levels of homeschooling and levels of parental assistance). The 5x3 comparison has a larger sample size requirement. A medium effect size ( $f = 0.25$ ), an alpha of .05, a power of .80, numerator  $df = 8$ , and eight groups were utilized. A small effect size is possible and was applied as needed. Applying the above parameters, it was determined 249 participants were sufficient for the factorial ANOVAs.

#### **Research Question 4**

To address research question 4, a multiple linear regression was conducted to examine the relationship between Georgia hybrid homeschool program characteristics (program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the program; parent-teacher communication; learning at home routines) and Georgia hybrid homeschool students' performances on the SAT and ACT. A multiple linear regression is appropriate when testing the predictive strength between a group of independent variables on a continuous criterion variable (Tabachnick & Fidell, 2019). The predictor variables correspond to program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the

program; parent-teacher communication; learning at home routines. Parent-teacher communication and level of parental assistance at home were dummy coded due to the categorical nature of the variables. The continuous criterion variables correspond to SAT and ACT scores.

Before the regression analyses, the assumptions of a multiple linear regression were tested. The first assumption of a multiple linear regression is that there are multiple independent variables. This assumption was supported due to the examination of several independent variables. The second assumption of a multiple linear regression is that the dependent variable is a continuous measurement. The assumption was to be supported due to the dependent variable, SAT and ACT scores, being an interval-level measurement. The assumptions of normality, homoscedasticity, and the absence of multicollinearity were also tested (Navarro, 2018). Normality and homoscedasticity were to be tested with a normal Q-Q scatterplots and a residuals scatterplots, respectively. Normality was met if the data in the Q-Q scatterplot closely followed the normality trend line. Homoscedasticity was assessed with a residuals scatterplot. If the data in the scatterplot display random spread, then the assumption for homoscedasticity would be supported. Absence of multicollinearity was evaluated with Variance Inflation Factors (VIFs). VIF values below 5 suggest the absence of multicollinearity assumption was met. Multivariate normality was planned to be verified with Mardia's multivariate skewness statistic. Multivariate outliers were planned to be identified through use of Mahalanobis Distances. All findings of the assumption checks were presented with figures and tables.

The  $F$  test was used to assess if a collective predictive relationship exists between the independent variables on SAT and ACT scores. Type of schooling, learning at home routines, program accreditation, number of days on-site, involvement of parents in decision-making, parental support from the program, and parent-teacher communication were analyzed collectively. The coefficient of determination,  $R^2$ , identified the amount of variance in SAT and ACT scores that can be explained by these predictor variables. Individual  $t$ -tests were used to examine the predictive ability of each independent variable on SAT and ACT scores. For the significant predictor variables, the unstandardized beta ( $B$ ) was reported to identify how SAT and ACT scores fluctuate based on changes to the predictor variables. Statistical significance was reported at the generally accepted level,  $\alpha = .05$ , for the  $F$  test and  $t$  tests. The findings of the  $F$  tests,  $t$ -tests, unstandardized beta ( $B$ ), standardized beta ( $\beta$ ), and  $p$ -values were reported.

The multiple linear regressions incorporated the examination of nine predictor variables. A medium effect size ( $f^2 = 0.15$ ), an alpha of .05, and a power of .80 was utilized. Applying the above parameters, it was determined 114 participants would be sufficient for the multiple linear regressions.

### **Summary**

The purpose of this study was to examine the relationship between hybrid homeschool program characteristics and standardized test scores. In this chapter, the methodology for the proposed study was described. The selection of a quantitative, correlational-predictive research design was justified. The variables of interest were operationalized in terms of the level of measurement and possible values. The size of the population of interest was estimated due to limited studies in the literature. This inquiry

consisted of a purposive sampling of known hybrid homeschool programs in the state of Georgia. The self-reported survey instrument and use of SAT and ACT scores were described for use in the current study. The data collection occurred through administration of the newly-designed survey through Qualtrics. Validity and reliability of the survey was assessed through expert panel review and a validity study. The data analysis plan involved the use of ANOVAs, factorial ANOVAs, and multiple linear regression. Power analyses were conducted to identify the minimum sample size requirements for each analysis assuming a medium, and possibly small effect size.

## **Chapter IV**

### **RESULTS**

The overall purpose of this study was to examine the relationship between hybrid homeschool program characteristics and standardized test scores. In this chapter, the findings of the survey and data analysis will be presented. Descriptive statistics were used to summarize the demographics and program characteristics of the sample. To address the research questions, a series of ANOVAs and a multiple linear regression were utilized. Statistical significance was evaluated at the generally accepted level,  $\alpha = .05$ .

#### **Descriptive Statistics**

The sample included 175 survey responses. A response rate was undeterminable given the distribution of an anonymous link in private social media groups. The completion rate was 55%. The sample consisted of 98 males (56%) and 77 females (44%). A majority of the sample included White students ( $n = 145, 82.86\%$ ) and non-Hispanic ( $n = 152, 87.36\%$ ). A total of 47 students were enrolled in 11th grade and 128 students were enrolled in 12th grade. Most students had completed only the SAT ( $n = 112, 64\%$ ). The entire sample was homeschooled at least once a week ( $n = 175, 100\%$ ). Yearly household income fluctuated among the students' families. Most students were homeschooled two days per week ( $n = 126, 72\%$ ). A total of 136 students attended a hybrid homeschool program and 39 students reported they homeschooled without using a hybrid program. A majority of students were not enrolled in a la carte classes outside of the home. Almost all students were enrolled in accredited homeschool programs ( $n = 133, 97.79\%$ ) and were granted accredited diplomas ( $n = 135, 99.26\%$ ). A majority of

students attended a hybrid homeschool program for 4 years or more ( $n = 100, 73.53\%$ ). Most students were formally registered as homeschool students ( $n = 113, 83.70\%$ ). Students predominantly attended hybrid homeschool programs three days per week ( $n = 124, 91.18\%$ ). Most students spent 7 or more hours per day receiving in-person instruction from an instructor at their hybrid homeschool program ( $n = 116, 85.29\%$ ). Most parents agreed their children’s homeschool program allowed them to be involved in important educational decisions. A majority of parents indicated parental support was provided through the hybrid program and teachers communicated with them. Parents agreed they should assist their children with their homeschool work each day. The survey descriptive statistics are outlined in Appendix E.

SAT scores for students ranged from 700 to 1,540, with  $M = 1,238.69$  and  $SD = 169.14$ . ACT scores ranged from 16 to 36, with  $M = 28.02$  and  $SD = 5.14$ . The summary statistics can be found in Table 4.

**Table 4**  
*Summary Statistics for SAT and ACT Scores*

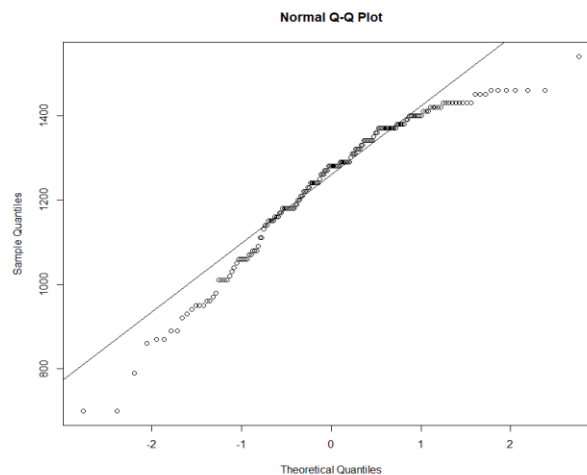
Variable	$n$	Min	Max	$M$	$SD$
SAT	175	700	1,540	1,238.69	169.14
ACT	61	16	36	28.02	5.14

**Research Question 1-** Is there a significant difference between 11th and 12th Georgia students in homeschool, hybrid homeschool, public high school, and private high school on SAT scores?

To address research question one, a one-way ANOVA was conducted to assess for differences in SAT scores by type of schooling (homeschool, hybrid homeschool,

public high school, and private high school). Due to the raw data not containing public high school and private high school cases, the ANOVA only compared homeschooled and hybrid homeschooled students. A series of one-sample  $t$ -tests were conducted to further examine for differences with public and private schools using summary statistics.

**ANOVAs.** Prior to analysis, the assumptions of an ANOVA were verified – normality and homogeneity of variance. Normality was tested with a Shapiro-Wilk test and a Q-Q scatterplot. The Shapiro-Wilk test was statistically significant ( $p < .001$ ), indicating the data may deviate from a normal distribution. Through visual examination of the Q-Q scatterplot, the data appeared to roughly follow the normality trend line (see Figure 2). Howell (2013) indicates violations of normality are not problematic when the sample size exceeds 50 cases. Homogeneity of variance was tested with Levene’s test. The Levene’s test was not statistically significant ( $p = .080$ ), indicating the assumption for homogeneity of variance was supported.



*Figure 2. Normal Q-Q plot for SAT scores.*

Table 5 below demonstrates the findings of the ANOVA were not statistically significant,  $F(1, 173) = 0.53, p = .468$ , indicating there were no significant differences in

SAT scores between homeschooled students and hybrid homeschooled students. The hybrid homeschool sample ( $M = 1243.68$ ) had slightly higher mean SAT scores in comparison to the homeschool sample ( $M = 1221.28$ ). Descriptive statistics for SAT scores by type of schooling are presented in Table 6.

**Table 5**

*ANOVA for SAT Scores by Type of Schooling*

Independent variable	Num df	Den df	<i>F</i>	<i>p</i>
Type of Schooling (Homeschool vs Hybrid Homeschool)	1	173	0.53	.468

**Table 6**

*Descriptive Statistics for SAT Scores by Type of Schooling*

Variable	SAT Scores		
	<i>n</i>	<i>M</i>	<i>SD</i>
Type of schooling			
Homeschool	39	1221.28	134.99
Hybrid homeschool	136	1243.68	177.85

### One-Sample *t*-Tests

A series of one-sample *t*-tests were conducted to assess for differences in SAT scores between homeschool and hybrid schools in comparison to public and private schools. Due to a lack of raw data for public and private schools, summary statistics were used to make the comparisons to the raw data for homeschool and hybrid schools. For each of one-sample *t*-tests, two-tailed examinations were utilized.

**Homeschool vs Public Schools.** A one-sample *t*-test was conducted for SAT scores between homeschool and public schools. The findings of the one-sample *t*-test

were statistically significant,  $t(38) = 8.16, p < .001$ , indicating significant differences in SAT scores between homeschool ( $M = 1221.28$ ) and public schools ( $\mu = 1045$ ). Table 7 presents the one-sample  $t$ -test for homeschool and public schools.

**Table 7**

*One-Sample t-tests for SAT Scores Between Homeschool and Public Schools*

Type of School	Homeschool			Public Schools			
	<i>N</i>	<i>M</i>	<i>SD</i>	SAT $\mu$	<i>t</i>	<i>df</i>	<i>p</i>
SAT scores	39	1221.28	134.99	1045	8.16	38	<.001

**Hybrid Homeschool vs Public Schools.** A one-sample  $t$ -test was conducted for SAT scores between hybrid homeschool and public schools. The findings of the one-sample  $t$ -test were statistically significant,  $t(135) = 13.03, p < .001$ , indicating significant differences in SAT scores between hybrid homeschool ( $M = 1243.68$ ) and public schools ( $\mu = 1045$ ). Table 8 presents the one-sample  $t$ -test for hybrid homeschool and public schools.

**Table 8**

*One-Sample t-tests for SAT Scores Between Hybrid Homeschools and Public Schools*

Type of School	Hybrid homeschool			Public Schools			
	<i>N</i>	<i>M</i>	<i>SD</i>	SAT $\mu$	<i>t</i>	<i>df</i>	<i>p</i>
SAT scores	136	1243.68	177.85	1045	13.03	135	<.001

**Homeschool vs Private Schools.** A one-sample  $t$ -test was conducted for SAT scores between homeschool and private schools. The findings of the one-sample  $t$ -test were not statistically significant,  $t(38) = 1.26, p = .215$ , indicating there were no significant differences in SAT scores between homeschool ( $M = 1221.28$ ) and private

schools ( $\mu = 1194$ ). Table 9 presents the one-sample *t*-test for homeschool and private schools.

**Table 9**

*One-Sample t-tests for SAT Scores Between Homeschool and Private Schools*

Type of School	Homeschool			Private Schools			
	<i>N</i>	<i>M</i>	<i>SD</i>	SAT $\mu$	<i>t</i>	<i>df</i>	<i>p</i>
SAT scores	39	1221.28	134.99	1194	1.26	38	.215

**Hybrid Homeschool vs Private Schools.** A one-sample *t*-test was conducted for SAT scores between hybrid homeschool and private schools. The findings of the one-sample *t*-test were statistically significant,  $t(135) = 3.26$ ,  $p < .001$ , indicating significant differences in SAT scores between hybrid homeschool ( $M = 1243.68$ ) and private schools ( $\mu = 1194$ ). Table 10 presents the one-sample *t*-test for hybrid homeschool and private schools.

**Table 10**

*One-Sample t-tests for SAT Scores Between Hybrid Homeschools and Private Schools*

Type of School	Hybrid homeschool			Private Schools			
	<i>N</i>	<i>M</i>	<i>SD</i>	SAT $\mu$	<i>t</i>	<i>df</i>	<i>p</i>
SAT scores	136	1243.68	177.85	1194	3.26	135	<.001

**Research Question 2-** Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of set homeschool day schedules on SAT scores?

To address research question two, a factorial ANOVA was conducted to assess for differences in SAT scores by levels of homeschooling and levels of set homeschool

day schedules. The independent variables corresponded to levels of homeschooling and levels of set homeschool day schedules. Levels of homeschooling had five categories: one day, two days, three days, four days, and five days. Levels of set homeschool day schedules contained two possibilities: yes or no. The dependent variable corresponded to SAT scores. An interaction effect was also examined between levels of homeschooling and levels of set homeschool day schedules.

Normality was verified and supported for SAT scores in the previous research question given the results of the normal Q-Q plot and the sufficient sample size. Levene’s test was not statistically significant ( $p = .643$ ), indicating the homogeneity of variance assumption was supported. As reported in Table 11 below, the findings of the ANOVA were statistically significant for the number of days attending hybrid programs,  $F(4, 128) = 3.32, p = .013$ , indicating there were significant differences in SAT scores by the number of days attending a hybrid program.

**Table 11**

*ANOVA for SAT Scores by Number of Days Attending Hybrid Program, Follow Set Schedule, and Interaction Effect*

Independent variable	Num df	Den df	<i>F</i>	<i>p</i>
Number of days attending hybrid program (1, 2, 3, 4, 5 days)	4	128	3.32	.013
Follow set schedule (Yes or No)	1	128	3.28	.073
Number of days attending hybrid program/Follow set schedule	2	128	2.17	.118

Upon examination of the Tukey pairwise comparisons, students who attended hybrid programs for three days ( $M = 1255.65$ ) had significantly higher mean SAT scores in comparison to students who attended hybrid programs for two days ( $M = 996.00$ ).

Descriptive statistics for SAT scores by number of days attending a hybrid program and following a set schedule are presented in Table 12. Table 13 presents the Tukey pairwise comparisons for mean SAT scores by number of days attending the program.

**Table 12**

*Descriptive Statistics for SAT Scores by Number of Days Attending Hybrid Program, Follow Set Schedule, and Interaction Effect*

Variable	SAT Scores		
	<i>n</i>	<i>M</i>	<i>SD</i>
Number of days attending hybrid program			
1 day	5	1164.00	218.70
2 days	5	996.00	218.01
3 days	124	1255.65	168.88
4 days	1	1400	-
5 days	1	1240	-
Follow set schedule			
Yes	86	1268.84	196.42
No	50	1200.40	162.03
Number of days attending hybrid program/Follow set schedule			
1 day – follow set schedule	2	1030.00	70.71
1 day – do not follow set schedule	3	1253.33	251.48
2 days – follow set schedule	2	1125.00	261.63
2 days – do not follow set schedule	3	910.00	181.93
3 days – follow set schedule	81	1276.67	157.34
3 days – do not follow set schedule	43	1216.05	184.16
4 days – follow set schedule	1	1400	-
4 days – do not follow set schedule	0	-	-

5 days – follow set schedule	0	-	-
5 days – do not follow set schedule	1	1240	-

**Table 13**

*Tukey Pairwise Comparisons for Mean SAT Scores by Number of Days Attending Program*

Number of days attending program	SAT Scores	
	MD	<i>p</i>
2 Days vs. 1 Day	-168.00	0.520
3 Days vs. 1 Day	91.65	0.759
4 Days vs. 1 Day	236.00	0.709
5 Days vs. 1 Day	76.00	0.994
3 Days vs. 2 Days	259.65	<b>0.009</b>
4 Days vs. 2 Days	404.00	0.195
5 Days vs. 2 Days	244.00	0.682
4 Days vs. 3 Days	144.35	0.915
5 Days vs. 3 Days	-15.65	1.000
5 Days vs. 4 Days	160.00	0.963

Students following a set schedule was not a statistically significant factor,  $F(1, 128) = 3.28, p = .073$ , indicating there were no significant differences in mean SAT scores based on students following a set schedule. Students who followed a set schedule ( $M = 1268.84$ ) had slightly higher mean SAT scores in comparison to students who did not follow a set schedule ( $M = 1200.40$ ). In addition, the interaction effect (number of days attending hybrid program/follow set schedule) was not statistically significant,  $F(2, 128) = 2.17, p = .118$ , indicating there were not significant differences in SAT scores by

the combination of number of days attending program and following a set schedule. Due to non-significance of the main effect, following a set schedule, and the interaction effect, Tukey pairwise comparisons were not conducted for these variables.

**Research Question 3-** Is there a significant difference between 11th and 12th Georgia students' levels of homeschooling and levels of parental assistance on SAT scores?

To address research question three, a factorial ANOVA was conducted to assess for differences in SAT scores by levels of homeschooling and levels of parental assistance. The independent variables corresponded to levels of homeschooling and levels of parental assistance. Levels of homeschooling had five categories: one day, two days, three days, four days, and five days. Levels of parental assistance contained three possibilities: < 1 hour, 1-3 hours, and > 3 hours. The dependent variable corresponded to SAT scores. An interaction effect was also examined between levels of homeschooling and levels of parental assistance.

Normality was verified and supported for SAT scores in research question one, given the results of the normal Q-Q plot and the sufficient sample size. Levene's test was not statistically significant ( $p = .801$ ), indicating the homogeneity of variance assumption was supported. Table 14 below and similar to research question two, the findings of the ANOVA were statistically significant for number of days attending hybrid program,  $F(4, 127) = 3.37, p = .012$ , indicating there were significant differences in SAT scores by the number of days attending a hybrid program.

**Table 14**

*ANOVA for SAT Scores by Number of Days Attending Hybrid Program, Level of Parental Assistance, and Interaction Effect*

Independent variable	Num df	Den df	<i>F</i>	<i>p</i>
Number of days attending hybrid program (1, 2, 3, 4, 5 days)	4	127	3.37	.012
Levels of parental assistance (< 1 hour, 1-3 hours, > 3 hours)	2	127	2.98	.055
Number of days attending hybrid program/Follow set schedule	2	127	2.38	.097

As presented in the Tukey pairwise comparisons for research question two, students who attended hybrid programs for three days ( $M = 1255.65$ ) had significantly higher mean SAT scores in comparison to students who attended hybrid programs for two days ( $M = 996.00$ ). Descriptive statistics for SAT scores by number of days attending a hybrid program and levels of parental assistance are presented in Table 15.

**Table 15**

*Descriptive Statistics for SAT Scores by Number of Days Attending Hybrid Program, Level of Parental Assistance, and Interaction Effect*

Variable	SAT Scores		
	<i>n</i>	<i>M</i>	<i>SD</i>
Number of days attending hybrid program			
1 day	5	1164.00	218.70
2 days	5	996.00	218.01
3 days	124	1255.65	168.88
4 days	1	1400	0
5 days	1	1240	0
Levels of parental assistance			

< 1 hour	57	1252.46	191.45
1-3 hours	64	1260.00	163.95
> 3 hours	15	1140.67	156.64

Number of days attending hybrid program/Levels of parental assistance

1 day – < 1 hour of parental assistance	5	1164.00	218.70
1 day – 1-3 hours of parental assistance	0	-	-
1 day – > 3 hours of parental assistance	0	-	-
2 days – < 1 hour of parental assistance	3	910	181.93
2 days – 1-3 hours of parental assistance	1	1310	-
2 days – > 3 hours of parental assistance	1	940	-
3 days – < 1 hour of parental assistance	48	1283.33	170.00
3 days – 1-3 hours of parental assistance	62	1256.94	165.50
3 days – > 3 hours of parental assistance	14	1155.00	152.00
4 days – < 1 hour of parental assistance	0	-	-
4 days – 1-3 hours of parental assistance	1	1400	-
4 days – > 3 hours of parental assistance	0	-	-
5 days – < 1 hour of parental assistance	1	1240	-
5 days – 1-3 hours of parental assistance	0	-	-
5 days – > 3 hours of parental assistance	0	-	-

Levels of parental assistance were not a statistically significant factor,  $F(2, 127) = 2.98, p = .055$ , indicating there were no significant differences in mean SAT scores by levels of parental assistance. Mean SAT scores for the three levels of parental assistance were 1252.46 for less than 1 hour of parental assistance, 1260.00 with 1-3 hours of parental assistance, and 1140.67 for more than 3 hours of parental assistance. In addition,

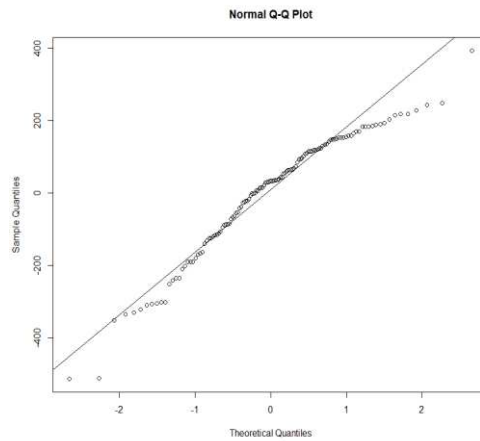
the interaction effect (number of days attending hybrid program/levels of parental assistance) was not statistically significant,  $F(2, 127) = 2.38, p = .097$ , indicating there were no significant differences in SAT scores by the combination of number of days attending the program and levels of parental assistance. Due to non-significance of the main effect, levels of parental assistance, and the interaction effect, Tukey pairwise comparisons were not conducted for these variables.

**Research Question 4-** Are Georgia hybrid homeschool program characteristics (program accreditation; number of days on-site; involvement of parents in decision-making; parental support from the program; parent-teacher communication; use of set schedule; and levels of parental assistance) significant predictors of Georgia hybrid homeschool students' performances on the SAT?

To address research question four, a multiple linear regression was conducted to examine the predictive relationship between hybrid homeschool program characteristics on SAT scores. The independent variables corresponded to number of days on-site, involvement of parents in decision-making, parental support from the program, parent-teacher communication, and learning at home routines. Number of days on-site was a continuous-level variable. Involvement in decision-making, parental support from the program, and parent-teacher communication were nominal-level variables, with "disagree" being treated as the reference category. Learning at home routines was a nominal-level variable, with "neutral" being treated as the reference category. Accreditation was not included in the model due to lack of variability in the responses.

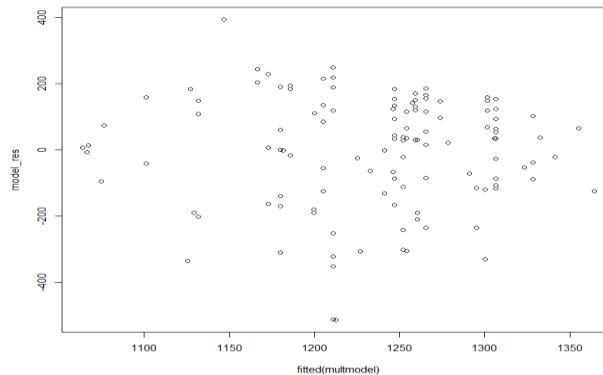
Prior to analysis, the assumptions of a multiple linear regression were addressed. Normality of the residuals was tested with a normal Q-Q plot, in which the data closely

followed the normality trend line (see Figure 3). Multivariate normality was tested with Mardia's multivariate skewness statistic. The Mardia's skewness statistic was 21.07, which indicates potential deviations for multivariate normality. However, the sample size in the regression model was sufficiently large to bypass violations of normality.



*Figure 3. Normal Q-Q Plot for Regression Model.*

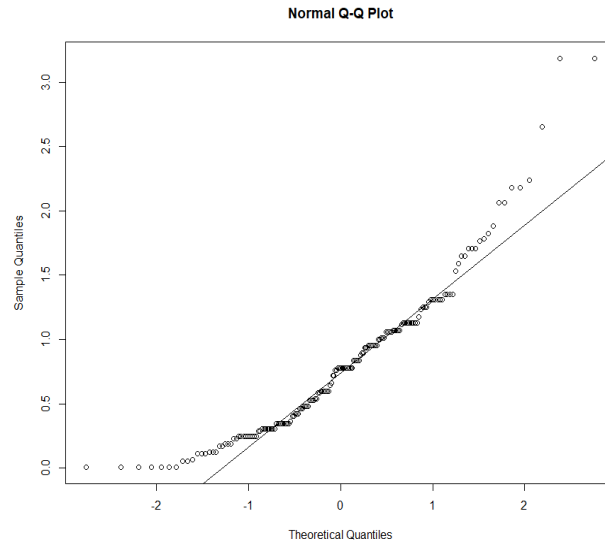
The assumption of homoscedasticity was tested with a residuals scatterplot (see Figure 4). The residuals scatterplot did not depict a recurring pattern, providing evidence for homoscedasticity.



*Figure 4. Residuals Scatterplot for Regression Model.*

Multivariate outliers were evaluated with Mahalanobis Distances. By examination of a normal Q-Q plot of Mahalanobis Distances there appeared to be

deviations from the normality trend line (see Figure 5). However, no further reductions were made to the spreadsheet due to the insufficient group sizes in the nominal-level predictors.



*Figure 5. Normal Q-Q Plot of Mahalanobis Distances in Regression Model.*

Absence of multicollinearity was verified with variance inflation factors (VIFs). All the VIFs were lower than 10, providing evidence for the absence of multicollinearity assumption (Table 16).

**Table 16**

*Variance Inflation Factors*

Variable	VIF
Number of days on-site	1.21
Involvement in decision-making	2.03
Parental support from the program	2.31
Parent-teacher communication	2.39
Learning at home routines	1.31

The overall findings of the multiple linear regression were not statistically significant,  $F(12, 115) = 1.43, p = .134, \text{Adjusted } R^2 = .039$ , indicating that collectively the hybrid program characteristics did not significantly predict SAT scores. Upon further examination of the individual predictors in the model, none of the independent variables were significant predictors of SAT scores (Table 17).

**Table 17**

*Multiple Linear Regression with Hybrid Program Characteristics Predicting SAT Scores*

Variable	<i>B</i>	$\beta$	<i>t</i>	<i>p</i>
(Intercept)	1094.25	1094.25	9.93	<.001
Number of days on-site	52.62	0.14	1.46	.147
Involvement in decision-making (reference: Disagree)				
Neutral	-8.75	-0.01	-0.06	.954
Agree	-67.49	-0.19	-0.52	.606
Strongly agree	-13.17	-0.04	-0.10	.919
Parental support from program (reference: Disagree)				
Neutral	-22.35	-0.04	-0.17	.864
Agree	-44.14	-0.12	-0.36	.723
Strongly agree	-50.26	-0.13	-0.39	.694
Parent-teacher communication (reference: Disagree)				
Neutral	30.04	0.03	0.18	.857
Agree	180.89	0.51	1.27	.208
Strongly agree	139.92	0.39	0.95	.345
Learning at home routines (reference: Neutral)				
Agree	5.04	0.01	0.12	.902
Strongly Agree	-74.43	-0.16	-1.43	.157

*Note.* Overall model fit:  $F(12, 115) = 1.43, p = .134, \text{Adjusted } R^2 = .039$ .

## **Chapter V**

### **CONCLUSIONS AND INTERPRETATIONS**

Four research questions regarding hybrid homeschool and homeschool student academic achievement guided this inquiry. It was hypothesized increased parental involvement using Epstein's theory would result in higher academic performance when examining hybrid program characteristics and the spheres of influence in Epstein's model. Additional factors which could influence SAT scores were examined such as number of days homeschooled, hours spent during a school/homeschool day as well as assistance from the parents on homeschool work. While hybrid homeschool student SAT scores were significantly higher compared to public and private school scores, the remaining research questions failed to prove any significant differences in scores based on levels of homeschooling, set schedule on homeschool days, parental assistance, or variations in hybrid program characteristics. Essentially, the most prevalent factor in this study which is suggestive of influence on academic achievement is homeschooling.

#### **Summary**

Research Question 1 was designed to evaluate significant differences in 11th and 12th grade Georgia student SAT scores among four groups: homeschool, hybrid homeschool, public, and private students. The results showed there were significant differences in scores across the groups. Based on parent-reported scores, 175 Georgia hybrid homeschool and homeschool students demonstrated significant differences in SAT scores compared to public and private school students. The average SAT score for the

hybrid homeschool student group in this survey was 198.68 points higher than the Georgia public school average and 49.68 points higher than the Georgia private school average. The average SAT score for the homeschool student group in this survey was 176.28 points higher than the Georgia public school average and 27.28 points higher than the Georgia private school average. However, the homeschool group needed to be bigger for adequate power. In comparing the homeschool SAT scores ( $M = 1221.28$ ) and hybrid homeschool SAT scores ( $M = 1243.68$ ), there were no statistically significant differences, suggesting these groups performed similarly.

Research Question 2 analyzed SAT scores based on levels of homeschooling and set homeschool day schedules between homeschool and hybrid homeschool students. Neither variable (level of homeschooling or set homeschool day schedule) resulted in significant differences in SAT or ACT scores. Upon initial examination, the factorial ANOVA was significant for the number of days attending a hybrid program, suggesting a significant difference in SAT scores between the homeschool level groups. Students who attended a hybrid homeschool program three days a week as opposed to two days a week did appear to score significantly better on the SAT based on pairwise comparisons. This result is unreliable due to the very limited sample size of students attending only two days a week. The sample size for the two-day group was only five students while the sample size for the three-day group was 124 students. Based on the sample size limitations, the initial conclusion of a significant difference in SAT score based on the number of days attending a hybrid homeschool program was rejected. The factorial ANOVA for set homeschool day schedules was also not significant.

Research Question 3 was designed to examine differences in levels of homeschooling and levels of parental assistance on SAT scores. The factorial ANOVA demonstrated a significant difference in SAT scores for students attending three days a week compared to two, but this was again rejected due to an insufficient sample size of five students in the two-day-a-week group. Levels of parental assistance did not result in statistically significant SAT scores. There were also no significant differences in SAT scores when analyzing the combination of number of days attending the program and levels of parental assistance.

Research Question 4 was designed to predict SAT scores based on hybrid homeschool program characteristics. Ultimately, the goal was to test Epstein's Theory of Parental Involvement as it applied to hybrid programs. The hybrid program characteristics reviewed included number of days on-site, involvement of parents in decision-making, parental support from the program, parent-teacher communication, and learning at home routines. An analysis using multiple linear regression showed no statistical significance overall implying none of the hybrid program characteristics were significant predictors of SAT scores.

### **Interpretation**

The effect of parental involvement through homeschooling at least one day a week appears to be beneficial in terms of academic achievement of 11th and 12th-grade students. Both homeschool and hybrid groups had statistically significant scores compared to public school averages and the hybrid homeschool group also had statistically significant scores compared to the private school averages. When compared to each other, the hybrid and homeschool groups performed similarly. Homeschooling is

the main finding in this study which seemed to have an impact on academic achievement. The number of days students are homeschooled and their homeschool routines or parental assistance did not affect academic achievement in this study but the sample size of 175 participants fell short of the 249 participants needed for the factorial ANOVA.

A possible reason why this study did not show differences in SAT scores based on hybrid program characteristics may be related to the strong similarities in hybrid programs sampled. The sampling of highly similar hybrid programs was unexpected since Wearne's (2020) research reported greater variation with programs meeting anywhere from one to four days a week. Hybrid programs are not strongly regulated by the state, which allows for more freedom in their daily operations (Wearne, 2021). Hybrid program characteristics were expected to be variable, yet the results of this survey show many of the programs that the respondents attend operate almost uniformly. A majority of the hybrid students (91%) attend school three days per week and 85% spend seven or more hours per day receiving in-person instruction at the school. Similar to prior studies, more than 80% of the survey respondents formally register with the state as a homeschool family. Ninety-eight percent of hybrid homeschool respondents attend an accredited program.

With a high number of similarities in these Georgia-accredited programs, additional studies could be done to purposely sample more students of unaccredited programs, which would potentially have more variability. Overall, the only statistically significant findings in this study were homeschool and hybrid homeschool SAT scores in comparison to public and private school averages. The hybrid homeschool student averages ( $M = 1243.68$ ) were statistically significant compared to the public ( $M = 1045$ )

and private school peers ( $M = 1194$ ). Yet there were no significant differences in averages SAT scores when taking into account parental assistance, set homeschool schedules, or hybrid program characteristics. In general, this implies increased parental involvement in education supports higher academic achievement, regardless of the number of days homeschooled. A confounding finding in this study was a neutral position from 38% of the parents regarding parental assistance with homeschool work. This may be related to the advanced grade levels of the sample students.

Even though the final research question did not result in significant differences in SAT scores based on program characteristics, examining hybrid program characteristics from the survey responses still provides useful information and ultimately still supports Epstein's Theory. Epstein's spheres of influence and levels of parental involvement are prominently displayed in the survey results. As evidence of Epstein's *parenting* level, the hybrid parents agreed they are provided *support for parents* given that 88% stated their child's hybrid program provided parental support to assist them in hybrid education and 93% feel they are included in important educational decisions. Indeed, a review of a major hybrid chain website states training is provided yearly for hybrid parents (UMSI, 2020a).

Epstein's *communication* level involves increased communication between the school and the family. Ninety-five percent of hybrid parents state their hybrid program communicates well with them. With a lack of available data to indicate how well all Georgia public and private school parents feel about school/teacher communication, it is impossible to compare this characteristic between hybrid schools and a compilation of Georgia public/private schools. Hanson and Pugliese (2020) conducted and reported a

national study which generally reported if a public/private school parent receives school-initiated communication but their impression of whether the communication is adequate was not reported. A separate national study stated public/private school parents reported themselves as engaged but they desired more communication from the school (Benner & Quirk, 2020).

### **Limitations**

Limitations of this study include the difficulty in locating willing homeschool respondents and the selected definition of homeschooling. The survey had a poor completion rate, possibly due to many respondents being disqualified through the qualifying questions. The inadequate completed response from homeschool families was a significant limitation. Feedback voluntarily provided from homeschool families suggested many homeschool students are taking advantage of the “test-optional” colleges or not planning to attend college soon. Some homeschool families were eager to respond to the survey but could not complete it because their child did not take the SAT or ACT. This was a common theme among homeschool families who provided feedback about the survey. The University System of Georgia has resumed the admissions requirement for standardized testing but other colleges outside of this system continue to offer a test-optional application. If all colleges resume standardized testing requirements for admissions, future studies may be more successful in obtaining SAT and ACT scores from the Georgia homeschool population.

The survey was limited by a lack of variation in the hybrid sample, thereby preventing analysis which had been planned in the original proposal. The limited sample of students who attended more or less than three days a week prevented additional

analysis. Also, despite sharing the survey with unaccredited hybrid schools, nearly all hybrid families who responded had students in an accredited program. Accreditation is expected to create standardized characteristics of programs, thereby decreasing the variability of program characteristics in this survey. All but three of the hybrid families who responded to this anonymous survey reported being in an accredited hybrid program. Accreditation was initially intended to be a measured predictor of academic achievement but could not be included due to a lack of unaccredited hybrid student responses. While there are hybrid schools in Georgia that are not accredited, one could infer a majority of the 11th and 12th-grade hybrid students attend accredited programs based on this survey. Wearne (2020) noted parents often choose hybrid homeschool programs because of a better learning environment. Homeschool families who purposely seek accreditation may be doing so to help their child immediately qualify for the state-specific scholarship called HOPE. HOPE likely plays a role in high testing rates for the public and private school students as well, increasing the variability of students tested.

Other limitations include those of the standardized tests, ACT and SAT. The standardized tests measure select cognitive measures, thereby limiting the study results only to the areas in which these tests measure. Prior studies have shown economically disadvantaged students score less on standardized tests (Banerjee, 2016). However, most families included in this survey do not represent an economically disadvantaged population, as more than 70% of respondents reported an income of \$100,000 per year or higher. This finding is consistent with prior Georgia hybrid program surveys, where approximately 68% of respondents reported an income of \$100,000 per year or higher (Wearne, 2016). Additional analysis of hybrid and homeschool scores based on reported

income demonstrates an average SAT score of 1141 with a reported income of less than \$100,000 per year for both groups combined, however, this is a low-power analysis due to insufficient sample sizes for the low-income groups. This score is still higher and statistically significant compared to the public school average but is lower than the private school average.

Despite this study demonstrating hybrid homeschool parents are highly satisfied with their chosen programs in the areas of Epstein's spheres of influence, it was difficult to compare this satisfaction with the public and private school parent groups. The Georgia public school climate surveys are not available to see comparable parent satisfaction rates in the public school.

Bias and geographical boundaries were also limitations in this study as this researcher is highly involved in the Atlanta hybrid homeschool environment as an education entrepreneur, hybrid parent, and hybrid educator. While being involved in the homeschool community provided exclusive access to this hidden population, the groups accessed may not necessarily represent the average Georgia hybrid homeschool population as the entire population is not known. Furthermore, bias may have been introduced in the way this research was planned given the prior knowledge of how this educational method is implemented.

Overall, this study had limitations due to challenges in sampling, decrease in standardized testing numbers resulting in low-power analyses, and lack of program variability from the hybrid homeschool respondents. Even with limitations taken into consideration, the results of this study can build on the existing literature for hybrid

homeschool programs. Pertinent information about the Georgia hybrid homeschool population and programs has been discovered.

### **Recommendations**

As the literature continues to document alternative education such as homeschooling and hybrid homeschooling, future studies may be beneficial to choose an alternate method of academic achievement when comparing these two groups. Homeschool students likely have alternate means of assessing academic achievement based on the feedback that some of the homeschool respondents had chosen not to take the SAT or ACT. Establishing the preferred method of defining academic achievement in the homeschool population may result in a higher response rate. However, the preferred homeschool method of assessment may decrease the number of hybrid homeschool responses. This study suggests hybrid homeschool programs function more similarly to private schools based on the high number of accredited hybrid program respondents. While a majority of the Georgia hybrid homeschool respondents register as homeschool families with the Georgia DOE, their educational values may not necessarily be similar to a typical Georgia homeschool family. Future studies to examine these two groups from a pedagogical perspective would be useful to define their vision for education and discover similarities. This would direct any future studies for comparable outcomes that are valued by both groups.

### **Conclusion**

This study highlights the benefits of hybrid homeschooling on the academic achievement of 11th and 12th graders. Although variations in homeschool days, routines, and parental assistance showed no additional impact on academic achievement, parental

involvement in the form of homeschooling itself proved central to student success. Given that a 2023 EdChoice survey reported 58% of parents preferred at-home learning at least one day per week, hybrid schools may continue to grow. Experts agree that more families from the public and private school sectors are enrolling in hybrid schools than in previous years (Wearne, 2020). Studies such as this demonstrate hybrid student academic achievement could play a key role in future school choice policies to widen access to hybrid schools.

Even though Epstein's Model of Parental Involvement as applied to hybrid homeschool characteristics did not collectively or even individually demonstrate any benefit on standardized test scores, hybrid family responses to the survey are strongly correlated with Epstein's Model when viewed holistically. Parent satisfaction with these program characteristics was high among hybrid parents in this survey and 73% had enrolled their children for four years or more.

Hybrid schools have demonstrated an effective approach to parental involvement which could be considered in more traditional environments. The statistically significant test scores of hybrid students serve as evidence of this one measure of success, validating hybrid homeschooling as an effective educational method. The potential to deliver strong educational outcomes in partnership with parents should be more extensively researched for use in other educational settings that have a broader range of demographics and can reach a wider population of students.

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**APPENDIX A**  
**Survey Questions**

## APPENDIX A

### Survey Questions

#### An Analysis of Georgia Hybrid Program Characteristics and Hybrid Homeschool Student Academic Achievement Survey Questions

1. Does your family currently reside in Georgia?
  - a. Yes
  - b. No (*response opts out of survey*)
  
2. In what grade is your child currently enrolled for 2023-24?
  - a. 11<sup>th</sup> grade
  - b. 12<sup>th</sup> grade
  - c. None of the above (*response opts out of survey*)
  
3. Which of the following has your child completed and received results?
  - a. Scholastic Aptitude Test (SAT)
  - b. American College Test (ACT)
  - c. None of the above (*response opts out of survey*)
  
4. Is your child homeschooled at least one day a week? For University Model School families, does your child have at least one satellite day a week?
  - a. Yes
  - b. No (*response opts out of survey*)

5. What is your child's gender?
  - a. Male
  - b. Female
  
6. What is your child's race?
  - a. American Indian or Alaska Native
  - b. Asian
  - c. Black or African American
  - d. Native Hawaiian or Pacific Islander
  - e. White
  - f. Prefer not to respond
  
7. Is your child Hispanic or Latino?
  - a. Yes
  - b. No
  - c. Prefer not to respond
  
8. What is your annual household income before taxes?
  - a. Less than \$50,000 per year
  - b. \$50,000 to \$100,000 per year
  - c. More than \$100,000 but less than \$150,000 per year
  - d. \$150,000 or more per year
  - e. Prefer not to respond

9. \*How many days each week is your child homeschooled? (If your child is enrolled in a University Model School, how many satellite days are there each week?)

- a. 1 day
- b. 2 days
- c. 3 days
- d. 4 days
- e. 5 days
- f. None of the above

10. \*Which of the following programs does your child attend outside the home?

- a. A hybrid homeschool program
- b. A cooperative homeschool program with classes taught by parents or hired tutors
- c. A dual enrollment program
- d. None of the above

11. \*Is your child enrolled in classes using an a la carte option in addition to homeschooling other classes?

- a. Yes, my child takes some classes a la carte.
- b. No, my child does not take a la carte classes.

12. \*Is your child's hybrid homeschool program accredited? (Wearne, 2023)

- a. Yes
- b. No
- c. Unsure

13. Does the homeschool program grant an accredited high school diploma?

- a. Yes
- b. No
- c. Unsure

14. \*If your child is in a hybrid homeschool program, how many years has he/she attended? (Include the 2023-2024 school year)

- a. 1 year
- b. 2 years
- c. 3 years
- d. 4 or more years
- e. Did not attend in a hybrid program

15. Are the students at your hybrid homeschool program formally registered as homeschool students, private school students, or something else?

- a. Homeschool students
- b. Students enrolled in a private school
- c. It depends on the grade level
- d. Something else

16. \*How many days per week do high school students physically attend your hybrid homeschool program?

- a. 1
- b. 2
- c. 3
- d. 4

- e. 5
- f. Other

17. Which days do students in high school attend your school? (Wearne, 2023)

- a. Monday
- b. Tuesday
- c. Wednesday
- d. Thursday
- e. Friday

18. What is the average number of hours per day that students receive in-person instruction from an instructor at your hybrid homeschool program? (Wearne, 2023)

- a. Less than 1 hour
- b. 1 - 2 hours
- c. 3 - 4 hours
- d. 5 - 6 hours
- e. 7 or more hours

19. \*What is the average number of hours per day you assist your child with their homeschool work?

- a. Less than 1 hour
- b. 1 - 2 hours
- c. 3 - 4 hours
- d. 5 - 6 hours
- e. 7 or more hours

20. What is the average number of hours per day your child works on their homeschool work?

- a. Less than 1 hour
- b. 1 - 2 hours
- c. 3 - 4 hours
- d. 5 - 6 hours
- e. 7 or more hours

21. \*When completing homeschool work at home, does your child follow a schedule or routine?

- a. Yes
- b. No

22. How strictly does your child follow a homeschool schedule?

- a. Very strict daily homeschool schedule
- b. Strict daily homeschool schedule
- c. A little strict daily homeschool schedule
- d. Not strict at all daily homeschool schedule
- e. No daily homeschool schedule

For Questions 23-27, indicate how strongly you agree or disagree with each of the statements.

23. When homeschooling, a child should follow a schedule or routine.

- a. Strongly agree

- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

24. Your child's hybrid homeschool program allows you to be involved in important educational decisions.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

25. Parental support is provided through your child's hybrid homeschool, e.g., workshops, training, curriculum presentations

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

26. Teachers at your child's hybrid homeschool communicate with you as the parent.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree

e. Strongly disagree

27. One should assist their child with their homeschool work each day.

a. Strongly agree

b. Agree

c. Neutral

d. Disagree

e. Strongly disagree

28. What was your child's total SAT score? If taken more than once, please report only the highest total score.

29. What was your child's total ACT score? If taken more than once, please report only the highest total score.

**APPENDIX B**

**IRB Approval**

## APPENDIX B



### *Institutional Review Board (IRB) For the Protection of Human Research Participants*

#### PROTOCOL EXEMPTION REPORT

Protocol Number: 04413-2023

Responsible Researcher(s): Sharon Masinelli

Supervising Faculty: Dr. Michael Bochenko

Project Title: *An Analysis of Georgia Hybrid Program Characteristics and Hybrid Homeschool Student Academic Achievement.*

#### INSTITUTIONAL REVIEW BOARD DETERMINATION:

This research protocol is **exempt** from Institutional Review Board (IRB) oversight under 45 CFR 46.101(b) of the federal regulations, **category 2**. If the nature of the research changes such that exemption criteria no longer apply, please consult with the IRB Administrator ([tmwright@valdosta.edu](mailto:tmwright@valdosta.edu)) before continuing your research study.

#### ADDITIONAL COMMENTS:

- *Upon completion of the research study, collected data must be securely maintained and accessible only by the researcher(s) for a minimum of 3 years. At the end of the required time, collected data must be permanently destroyed.*

*If this box is checked, please submit any documents you revise to the IRB Administrator at [tmwright@valdosta.edu](mailto:tmwright@valdosta.edu) to ensure an updated record of your exemption.*

*Elizabeth Ann O'Phie*      *04.28.2023*  
Elizabeth Ann O'Phie, IRB Administrator

*Thank you for submitting an IRB application.  
Please direct questions to [irb@valdosta.edu](mailto:irb@valdosta.edu) or 229-253-2947.*

Revised: 04.02.10

**APPENDIX C**

**Principal/School Director Invitation Letter**

## APPENDIX C

### Principal/School Director Invitation Letter

Dear Principal/School Director,

My name is Sharon Masinelli, and I am a doctoral candidate at Valdosta State University. I am researching 11th and 12th grade hybrid homeschool families as part of an inquiry for hybrid homeschool student academic achievement. I would like to invite your families to participate in a survey regarding their experience in a hybrid school environment.

This survey is unique and designed to test theories of parental involvement within a hybrid homeschool program. It is anticipated your families could complete the survey within five to ten minutes. The survey is anonymous and voluntary. Valdosta State University will neither penalize nor reward the families or your school based on the responses to the survey.

On or before June 1, 2023, I will send you a separate email with a link to the survey and an invitation for your 11th and 12th grade families to take part in the survey.

If you are willing to help with this study, please simply forward the invitation email when it arrives. The families will need to complete the survey by August 1, 2023.

Sincerely,

Sharon Masinelli, MCMS, PA-C

## **APPENDIX D**

### **Parent Survey Letter**

## **APPENDIX D**

### **Parent Survey Letter**

Dear Parent,

You are being asked to participate in a survey research project entitled “An Analysis of Georgia Hybrid Program Characteristics and Hybrid Homeschool Student Academic Achievement,” which is being conducted by Sharon Masinelli, a doctoral student at Valdosta State University. The purpose of the study is to examine effects of parental involvement in a hybrid and homeschool environment on SAT or ACT scores. You will receive no direct benefits from participating in this research study. However, your responses may help us learn more about parental involvement in homeschooling. There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life. Participation should take approximately 5-10 minutes to complete. This survey is anonymous. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer. Participants must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older. You may print a copy of this statement for your records.

Questions regarding the purpose or procedures of the research should be directed to Sharon Masinelli at [samasinelli@valdosta.edu](mailto:samasinelli@valdosta.edu). This study has been exempted from Institutional Review Board (IRB) review in accordance with Federal regulations. The IRB, a university committee established by Federal law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator at 229-253-2947 or [irb@valdosta.edu](mailto:irb@valdosta.edu).

## **APPENDIX E**

### **Frequency Table for Nominal Variables**

**APPENDIX E**  
**Frequency Table for Nominal Variables**

Variable	<i>n</i>	<i>%</i>
Child's gender		
Male	98	56
Female	77	44
Child's race		
White	145	82.86
Black or African American	13	7.43
Asian	9	5.14
Other	6	3.43
Prefer not to say	2	1.14
Hispanic or Latino		
Yes	20	11.49
No	152	87.36
Prefer not to respond	2	1.15
Grade enrolled		
11th grade	47	26.86
12th grade	128	73.14
Tests completed		

American College Test (ACT)	51	29.14
Scholastic Aptitude Test (SAT)	112	64
Scholastic Aptitude Test (SAT), American College Test (ACT)	12	6.86
Homeschooled at least once a week		
Yes	175	100
No	0	0
Yearly household income before taxes		
Less than \$50,000 per year	2	1.14
\$50,000 to \$100,000 per year	30	17.14
More than \$100,000 but less than \$150,000 per year	65	37.14
\$150,000 or more per year	58	33.14
Prefer not to respond	20	11.43
Days per week homeschooled		
1 day per week	1	0.57
2 days per week	126	72.00
3 days per week	10	5.71
4 days per week	16	9.14
5 days per week	22	12.57
Programs attending outside home		
A hybrid homeschool program	136	77.71

A cooperative homeschool program with classes taught by parents or hired tutors	6	3.43
None of the above	33	18.86
Enrolled in classes outside of home using a la carte option		
Yes, my child takes some classes a la carte.	31	17.71
No, my child does not take a la carte classes.	144	82.29
Homeschool program accredited		
Yes	133	97.79
No	2	1.47
Unsure	1	0.74
Program grants accredited diploma		
Yes	135	99.26
No	1	0.74
Years attended hybrid homeschool program		
1 year	7	5.15
2 years	16	11.76
3 years	13	9.56
4 years or more	100	73.53
Formally registered as homeschool students		
Yes	113	83.70
No	17	12.59

I don't know	5	3.70
Days per week physically attending hybrid homeschool program		
1	5	3.68
2	5	3.68
3	124	91.18
4	1	0.74
5	1	0.74
What is the average number of hours per day that your child receives in-person instruction from an instructor at their hybrid homeschool program?		
1-2 hours per day	1	0.74
3-4 hours per day	9	6.62
5-6 hours per day	10	7.35
7 or more hours	116	85.29
What is the average number of hours per day you assist your child with their homeschool work? (rounded to the nearest hour)		
Less than 1 hour	68	38.86
1-2 hours	85	48.57
3-4 hours	20	11.43
5-6 hours	2	1.14

What is the average number of hours per day your child works on their homeschool work? (rounded to the nearest hour)

Less than 1 hour	4	2.29
1-2 hours	14	8.00
3-4 hours	82	46.86
5-6 hours	69	39.43
7 or more hours	6	3.43

Child follows set schedule when completing homeschool work at home

Yes	104	59.43
No	71	40.57

How strictly does your child follow a homeschool schedule?

No daily homeschool schedule	17	9.71
Not strict at all homeschool schedule	36	20.57
A little strict daily homeschool schedule	70	40.00
Strict daily homeschool schedule	46	26.29
Very strict daily homeschool schedule	6	3.43

When homeschooling, a child should follow a schedule or routine.

Neutral	33	24.26
Agree	79	58.09

Strongly agree	24	17.65
Your child's hybrid homeschool program allows you to be involved in important educational decisions		
Disagree	2	1.49
Neutral	8	5.97
Agree	58	43.28
Strongly agree	66	49.25
Parental support is provided through your child's hybrid homeschool		
Disagree	3	2.26
Neutral	13	9.77
Agree	78	58.65
Strongly agree	39	29.32
Teachers at your child's hybrid homeschool communicate with you as the parent.		
Disagree	2	1.52
Neutral	5	3.79
Agree	65	49.24
Strongly agree	60	45.45
Parents should assist their child with their homeschool work each day.		
Disagree	10	7.52

Neutral	51	38.35
Agree	65	48.87
Strongly agree	7	5.26

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