A COMPARISON OF PARTICIPATION AND PERFORMANCE WITH STUDENT ENROLLMENT STATUS IN TWO PUBLIC ONLINE K-12 CHARTER SCHOOLS, USING EXTANT DATA

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DISSERTATION ABSTRACT

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In order to understand withdrawal rates in online K-12 schools, it is vital to have detailed documentation of these rates and to describe characteristics of the students who withdraw compared to the students who remain enrolled. Once these characteristics are known schools can develop programs and/or policies that support students who are at risk of withdrawing.

This study was a descriptive analysis of (a) attendance, (b) lessons completed, (c) participation, (d) teacher-student communication, and (e) overall performance percentage comparing the means between the enrolled student population and the withdrawn student population using extant data. Four of the five variables, (a) attendance, (b) lessons completed, (c) teacher-student communication, and (d) overall performance percentage, were significant at the $p < .01$ level. Upon analysis, the results of average lessons per day were not reportable due to problems with the data. The Enrolled group had significantly higher means in the following variables: (a) attendance, (b) lessons completed, (c) teacher-student synchronous contact, and (d) overall performance percentage.

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DEDICATION

Dedicated to Robert R. Byers—without his love, insight, humor, and support, I never would have been able to complete this.

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

On May 7, 2012, President Barak Obama issued a proclamation naming that week National Charter Schools Week. In this proclamation, he stated that charter schools were "incubators of innovation" (White House Office of the Press Secretary, p. 1, 2012). He made a similar claim in 2009 when he cited charter schools as the area of education where innovations are happening (Quaid, 2009). The Alleghany County Charter Schools (Alleghany County Charter Schools, 2009) suggested that the innovation came from competition, which made charter schools try harder. Further, popular opinion has been swaying toward charter schools. A USC Dornsife/Los Angeles Times survey (Orr, 2011) found that 48 percent believed charter schools provided a better education than public schools, while only 24 percent reported that they thought public schools provided a better education than charters.

Online schools have emerged as a part of the charter school movement. In a policy document, Bush and Wise (2010) wrote that "digital learning is the great equalizer. It holds the promise of extending access to rigorous high quality instruction to every student across America, regardless of language, zip code, income levels or special needs" (p.2). For-profit Education Management Organizations (EMO), non-profit EMOs, and school districts themselves are opening public online K-12 charter schools across the nation.

K-12 Online Schools

Watson, Murin, Vashaw, Gemin, and Rapp (2010) provided key definitions and clarifications regarding K-12 online schools. Online learning was defined as instruction

provided through a web-based delivery system, like Learning Management System (LMS). Blended or hybrid learning combined online learning with other modes of learning, such as face-to-face instruction. According to Watson (2009) blended learning combined "online delivery of educational content with the best features of classroom interaction and live instruction to personalize learning, allow thoughtful reflection, and differentiate instruction from student to student across a diverse group of learners" (p. 5).

Online instruction could be synchronous, asynchronous, or a combination of both. Synchronous instruction was instruction that occurs in real time; that is, the teacher and student participate in the instruction together within a structured time frame. Asynchronous was defined as instruction that is delivered in a manner in which students and teachers work at different times (not interacting in real-time) (Watson, et. al., 2010). Most online programs primarily used asynchronous instruction, where students and teachers work at different times. Finally some online programs used a combination of synchronous lessons with online asynchronous curriculum and instruction.

Online School Categories

Most, if not all, operating online programs fell within one of the five categories (Watson et. al, 2010). Watson's five categories were: (a) state virtual schools, (b) multi-district online programs, (c) single district online programs, (d) consortium online programs, and (e) post-secondary online programs. *State virtual schools* generally provided supplemental programs for students within that particular state. *Multi-district online programs*, which could be district-run schools or charter schools, provided full time programs for students across an entire state. *Single district online programs* could be either full time or supplemental and provided educational options for students within that

particular school district. *Consortium online programs* were supplemental programs that provided educational options for either members of that consortium or for students who pay course fees. Finally, *post-secondary online programs* could be either full time or supplemental and served any student who met the entrance requirements and paid course fees.

Online School Formations

Online schools themselves came in various formations. Some schools, such as Virtual High School (VHS) offered part time options for students in numerous school districts who are members of the VHS consortium. Students could take a few courses and supplement their education. Other online school options were blended or hybrid options where students reported to a school building but participated in online courses and teaching. Still others were completely virtual full time programs where all teachers and students interacted in a virtual forum. Researchers who study online K-12 education sometimes compared these programs with each other or combine the online options into one category. This approach has been problematic due to the varied methods of delivery and the purpose of the schooling itself. For example, a student taking a few part time courses online may not feel as compelled to participate and fully engage in his/her online courses because the courses are a supplement to his/her full-time schooling whereas a student who is in a full-time virtual program may feel more compelled to fully engage in his/her online courses.

Growth of Online K-12 Education

Online K-12 education is relatively new. In 2004, the first annual report, *Keeping Pace with K-12 Online Learning,* was created by Learning Point Associates (Watson,

Winograd, & Kalmon, 2004). In this document, 22 states were initially identified for review due to the presence of online K-12 opportunities. In 2010, 48 out of 50 states had online options for K-12 students. Accurately representing how many students participate in online K-12 learning is difficult, however. Growth is occurring so rapidly that reports that include specific data regarding participation and enrollment are at risk of being out-of-date before they are even published (Watson, Murin, Vashaw, Gemin, & Rapp, 2010). The Sloan Consortium (Picciano & Seaman, 2009) conducted two nationwide surveys, one in the 2005-2006 school year and one in the 2007-2008 school year, which replicated their 2005-2006 survey. Picciano and Seaman (2009) estimated that the overall number of K-12 students engaged in online courses was 1,030,000. This number represented a 47 percent increase during the 12 months since their prior study in 2005-2006 (Picciano & Seaman, 2007).

Though this number represents only five percent of the student population nationwide, Christensen, Horn, and Johnson (2011) theorized that online K-12 education was a disruptive innovation that tracked the same pattern that other disruptive innovations have established (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). Instead of progressing in a linear fashion as enrollments increased, Christensen, Horn, and Johnson (2011) predicted that online K-12 education would increase in an *S* curve, which forecasted that by 2019, 50 percent of all high school courses would be delivered online. While the increased enrollments have come to fruition, evaluating online success remains difficult because defined common measures of student outcomes have not been forthcoming.

Lack of Common Metrics

Currently, online schools have varying ways of measuring similar outcomes. This variation may be due to differing state legislation (Watson, et. al., 2012; Watson, et. al., 2010; Rice 2006), to differing corporate policies (Pape, Revenaugh & Wicks, 2007) and/or due to a lack of national common metrics (Hawkins & Barbour, 2010; Pape, Revenaugh & Wicks, 2007; Watson., et. al., 2010, Watson, et.al. 2012). Hawkins and Barbour (2010) reported that though course completion and retention rates are commonly used to measure quality in online schooling, "no common metrics currently exist to calculate course completion and retention rates among virtual schools" (p. 5). State policymakers continue to face the challenge of understanding the effectiveness of online schooling due to the lack of common metrics (Watson, et.al., 2012; Pape, Revenaugh, & Wicks, 2007). Even basic information, such as how many students participated in online schooling across the nation or the demographics of these students were unknown (Watson, Winograd, & Kalmon, 2004). In 2004, Cavanaugh, Gillian, Kromrey, Hess & Blomeyer called for a common descriptive system for online schooling so that comparisons could be made between schools and programs and ensure for greater generalizability and synthesizability of research findings. However, no such system has yet been created (Watson, et. al, 2012; Bakia, Shear, Toyama, & Lasseter, 2012; Watson, Winograd, & Kalmon, 2004).

Student Withdrawals in Online Schools

As online education has grown significantly, both at the university level and at the K-12 level over the past 10 years, one of the critical concerns of online programs has been the significantly higher level of withdrawn students when compared to brick-and-

mortar schools (Rice, 2006). Researchers who studied online higher education have documented this higher rate repeatedly (Carter, 1996; Doherty, 2006; Frankola; 2001; Parker, 2003; Xenos, 2004). It is estimated that online university student attrition rates are 25-40 percent higher than the 10-20 percent rates of brick-and-mortar courses (Lykourentzou, Giannoukos, Nikolopoulos, Mpardis, Loumos 2009).

In K-12 online education, "student attrition is believed to be a significant problem among virtual schools" (Hawkins & Barbour, 2010, p. 5). Roblyer, Davis, Mills, Marshall, and Pape (2008) reported that attrition rates tended to be significantly higher for distance students than for brick-and-mortar students. Numerous studies compared online student achievement to brick-and-mortar achievement and reached the conclusion that due to speculated high levels of attrition, or withdrawals, the achievement data were skewed (Barbour & Reeves, 2010; Hughes, McLeod, Brown, Maeda, & Choi, 2007; Roblyer, Davis, Mills, Marshall & Pape, 2008). Researchers postulated that students who withdrew from the program, and were then not included in studies that focused on course completion, had low levels of achievement (Hawkins & Barbour, 2010). To add to the confusion, Willgang and Johnson (2009) reported that student withdrawal information "in online programs is often anecdotal and vague" (p. 117).

Lack of Research for Online Schools

Although there was an abundance of research regarding students who drop out of brick-and-mortar high schools (Bridgeland, Dilulio, & Balfanz, 2009; Aud, Hussar, Planty, Snyder, Bianco, Fox, Frohlich, Kemp, & Drake, 2010; Meeker, Edmonson, & Fisher, 2008; Rodriguez & Conchas, 2009; Dalton, Glennie, Ingels, & Wirt, 2009; Cataldi, Laird, & KewalRamai, 2009; Zvoch, 2006; McNeil, Coppola, Radigan, &

Vasquez-Heilig, 2008), there was little research examining online high school students (Rice, 2006). Rice stated that the "research base is smaller still when the population of students is furthered narrowed to the elementary grades" (p. 430). Much of the research regarding online learning studied adult learners in post-secondary institutions. Thus, there was a clear need to document and describe the withdrawal rate of K-12 online students. Interestingly, there were no studies other than program evaluations that described the students who are enrolled in online schools, nor were there studies that identified relationships among possible indicators and students who chose to withdraw from online schools.

The Problem of Student Withdrawals in Online K-12 Schools

Researchers who have studied online university programs found that there was a higher attrition rate of students who participated in the online courses when compared to the attrition rate of students who participated in the brick-and-mortar courses (Willgang & Johnson, 2010; Lykourentzou, et. al., 2009; Pierrakeas, Xenos, Panagiotakopoulos, & Vergidis, 2004). While this phenomenon was believed to continue in the online K-12 schools, there was little empirical evidence of this. Lary (2002) estimated that attrition rates ranged between 12-40 percent; Rice (2006) stipulated that the attrition rates might be as high as 50 percent. Due to the lack of common metrics, online K-12 schools and programs have a variety of definitions for withdrawal. One example showed 68.6 percent of schools surveyed by Hawkins and Barbour (2010) having trial period policies that range from one day to 185 days. If students withdrew from the online program during these trial periods, they were not counted as withdrawals nor were they counted in the course completion rates for those schools. Student withdrawals from online programs

were inherently problematic due to the lack of information about the students who attended the online programs and, more specifically, the lack of information about the students who withdrew from online programs.

Withdrawal Rates

In K-12 education, withdrawal rates were significantly different from dropout rates. High school dropout rates described students who have withdrawn and have not enrolled in another school. Moreover, dropout rates have not generally included students enrolled in grades K-8. Withdrawal, within a bricks-and-mortar school, is defined as any student who enrolls and leaves during the course of the school year. Online School withdrawal rates described students who enroll in online programs, had attendance or completed at least one lesson and/or assignment, and withdrew from the program.

Identifying Possible Factors that Contribute to Student Withdrawals from Online K-12 Schools

Various studies have been conducted in which characteristics of online students are examined. Roblyer and Marshall (2002-2003) studied the characteristics of online learners who pass courses as compared to those who fail. In the same study, Roblyer and Marshall tried to determine if there were predictors that indicated whether students would be successful in online programs. Roblyer, et. al. (2008) identified four factors that predicted student success in online 9-12. Nistor and Neubauer (2010) studied a number of indicators trying to predict participation and persistence in online university courses. Pierrakeas, Xenos, Panagiotakopoulos, and Vergidis (2004) and Willgang and Johnson (2009) studied factors and root causes of why students drop out of online university courses. Two findings were consistent across the two studies. First, GPA appeared to be a

somewhat reliable and significant predictor of online student success. Second, students who withdrew were most likely to do so in the first 14 to 28 days of a course. Other findings included (a) student demographics (Pierrakeas et al. 2004; Willgang & Johnson, 2009); (b) student engagement, including lesson completion and participation (Pierrakeas, et al. 2004); and (c) student communication with others (Pierrakeas, et al., 2004; Nistor & Neubauer, 2010; and Hughes, et. al., 2007).

Based upon my review of the literature, three indicators of student withdrawal emerged: (a) student demographics, (b) participation, and (c) performance. In the next section, I examined the findings around these indicators in an effort to gain more insight and understanding into the problem of student withdrawals from K-12 online programs. Figure 1 visually depicts the three indicators, while also accounting for other factors that may not have been identified yet through unexplained variance.

Student Demographics

A number of researchers asserted that students who enroll in online courses are students who are self-motivated and have a strong internal locus of control (Stevens, 1999; Clark, Lewis, Oyer, & Schriber, 2002; Roblyer & Marshall, 2002-2003). Because much of the research regarding K-12 online schools were related to prior studies conducted regarding online university courses, most students who participate in online K-12 education were believed to be similar to university students, having strong internal locus of control, self-motivation, and high levels of achievement (Barbour & Reeves, 2009; Roblyer & Marshall 2002-2003; Roblyer, et. al., 2008; Cavanaugh, Gillan,

Bosnick, Hess, & Scott, 2005; Ronsisvalle & Watkins, 2005).

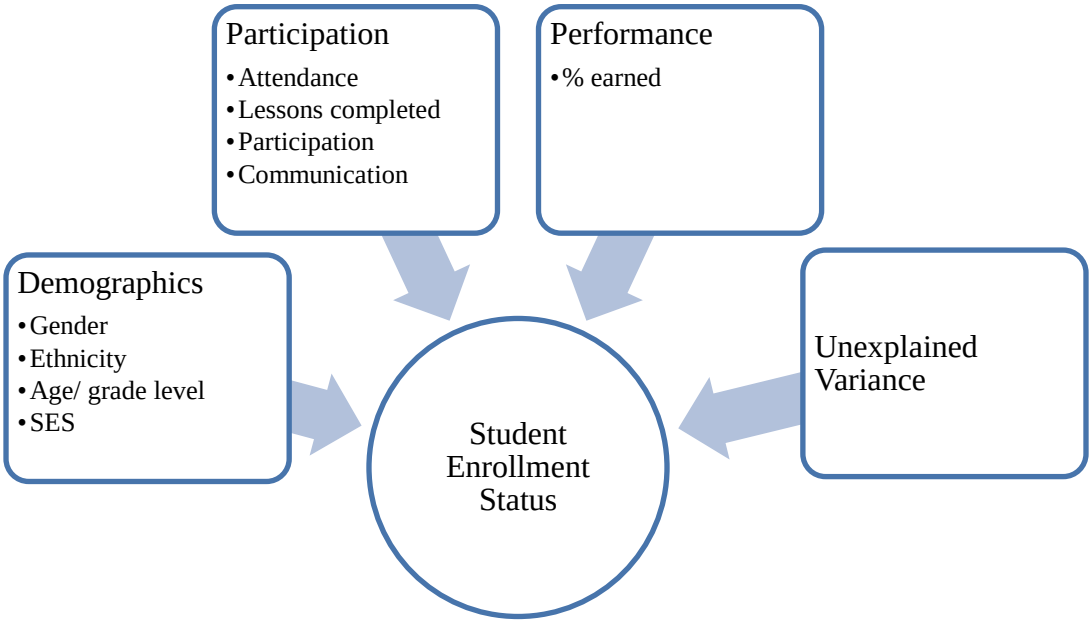

Figure 1. Theoretical model of possible factors influencing student enrollment in online K-12 schools.

Ronsisvalle and Watkins (2005) postulated that students who have been the first to use online education in the K-12 setting are either alternative students with a strong internal locus of control (e.g. home-schooled, professional actors or athletes, or have health conditions) or, seemingly contrary to this ideal, students who are perceived to lack self-motivation or internal locus of control (e.g. at-risk for withdrawing) recognizing that these descriptions of students are not mutually exclusive. Finding consistent descriptors of the students who are served by this format is difficult due to the lack of information in this new field. Identifying the characteristics of K-12 students who took and were successful in online courses is important to understanding the online K-12 school setting.

In 1999, Stevens described an actual student from an online Advanced Placement course. In this description, he noted that the student worked diligently on his online

course for three hours each weeknight and again on Sunday. The student worked on this course from his home in a roomy setting that includes his own computer and desk. The student's mother was an ex-teacher so she diligently monitored his progress in the course.

This description carried through time as describing the types of students that online education most frequently serves. Barbour and Reeves (2009) postulated that if this were a true description of students who participated in online schooling, that it "presents a rather selective view of the potential audience for online learning opportunities at the K-12 level" (p. 407). This description of a successful online student, however, has permeated much of the research regarding online K-12 schooling.

Clark, Lewis, Oyer, and Schriber (2002) conducted a program evaluation of Illinois Virtual High School (IVHS) in 2000-2001. IVHS was not a full time school and did not offer a diploma. Instead, students took courses through IVHS to enhance or support their full-time schooling. The findings published by Clark and his colleagues showed that administrators and counselors consistently found that students who were highly motivated, self-directed and/or who liked to work independently were the students who tended to experience success in the IVHS courses.

Roblyer and Marshall (2002-2003) created an instrument based on their literature review and on Virtual High School (VHS) teachers' assessments of successful high school student behaviors in online classes. VHS is a consortium of school districts that pay to be members so their students can use the online courses that VHS provides. Students take courses online part time to complete their schooling experience (a typical VHS student is also attending another school full-time). Roblyer and Marshall identified the following nine constructs related to successful behavior by surveying online teachers:

locus of control, internal versus external motivation, self-confidence and esteem, responsibility, willingness to take risks, time management, ability to set goals, achievement motivation, and self-reported computer/ technology skills. Their nine constructs suggested that successful high school students in online schools may have similar characteristics to their successful college student peers.

To investigate the nine constructs, Roblyer and Marshall (2002-2003) created a survey, called the *Educational Success Prediction Instrument* (ESPRI), and had students from 13 different schools around the country complete it. The survey included questions that gathered self-reported data on demographic and personal characteristics, using a seven-point Likert scale. The researchers aligned the survey data with achievement data collected from teachers as students completed the online courses. They found the data did not confirm a relationship between demographic factors (age, previous experience with distance education courses, and outside school responsibilities) or personal characteristics with academic achievement, but they could predict student success, failure or withdrawal using other factors, like study environment, motivation, and computer confidence. Those three factors (study environment, motivation, and computer confidence) were the best predictors of successful and unsuccessful students in an online course.

Contrary to both the findings published by Clark et al. (2002) and Roblyer and Marshall (2002-2003), Hughes, et. al. (2007) found that "online courses can provide successful alternative learning opportunities for Algebra students . . . even for students who are on less rigorous paths" (p. 208). Their research compared student learning and student perception of the learning environment within online and traditional courses. In the Hughes et al. study, students self-reported demographic information via a survey.

While the demographics of the online students and traditional students were very similar, 81 percent of the traditional students reported that they were on a college preparatory path, while only 33 percent of the online students reported this, suggesting that students in the traditional classroom are more likely to have college aspirations than students in online courses.

At the university level, Pierrakeas, et al. (2004) used a mixed method design to study dropout rates for specific online courses. They used three sources of data. First, they analyzed demographic information from student records. Second, they surveyed the tutors who worked with those students enrolled in the online courses for information, such as number of face-to-face meetings, and grades recorded. Finally, they interviewed students who had dropped out to ascertain the reason for their withdrawal. Using multivariate statistics and correlations, they found that student characteristics such as gender and employment were not relevant to student retention in an online university setting. They did not find any characteristics that predicted retention.

In another study using university students, Willgang and Johnson (2009) examined why students dropped out of an online university program by surveying students who left the program during their first course. Using a logistic regression analysis of the student demographic data, they found that males were more likely to drop online university courses than females. No explanation for this finding emerged from their study. Theirs was the first known study to examine the influence of gender on success or withdrawal rates in online education.

Varying Descriptions of Online Students

Descriptions of who attended online K-12 schools vary greatly, from students who were self sufficient (as evidenced by strong motivation and engagement) to students who were at-risk or homebound. As described earlier, Roblyer and Marshall (2002-2003) developed an instrument that predicted which students would be successful in online high schools; however, since 2002, online K-12 education has grown significantly, with 213,926 course enrollments in Florida Virtual School in 2009-2010 alone (Watson, Murin, Vashaw, Gemin, & Rapp, 2010). Currently, there is not a consistent description of the students who attended online schools and with such large growth, it was possible that the student characteristics and demographics change significantly over time.

Student Participation in K-12 Online Schools

In K-12 online schools, student participation looks significantly different from brick-and-mortar schools. In brick-and-mortar schools, student participation can be measured by attendance in a physical classroom, on-task behavior, such as answering questions, participating in a real-time discussion, or other such measures. In online schools, student participation is measured in different ways, such as lesson completion and/or hours of attendance.

Participation has been identified as an integral component of online schooling if students are to be successful. Paloff and Pratt (1999) stated that "without the support and participation of a learning community, there is no online course" (p. 29). As with course completion, however, there is not a common definition of what participation means in an online school, nor is there a common measure to represent participation in online schools.

Online standards for participation. One of the standards identified by the North

American Council for Online Learning (NACOL, 2007) as a standard that would ensure quality online teaching was to plan, design, and incorporate strategies to "encourage active learning, interaction, participation and collaboration in the online environment" (p. 4). The two benchmarks that specifically address participation under this standard maintain that online teachers should mandate participation by "setting limits if participation wanes or if the conversation is headed in the wrong direction" and that teachers should use "best practices to promote participation" (p. 4), although no definition of what is meant by *participation* was offered by NACOL.

One of the aspects of online schooling that is appealing to students is the flexibility of time. Students can complete the course at their own pace (within reason) and on their own schedule. Participation becomes increasingly important for teachers to monitor to ensure that students are completing lessons, turning in assessments, and continuing on to complete the course as a whole. Based on the NACOL standard, participation and interaction or collaboration with the teacher created high quality learning experiences for online students.

Factors predicting collegiate online course completion. Nistor and Neubauer (2010) studied participation patterns in an online university course and defined participation as the learner accomplishing "all activities required by the underlying didactical concept" (p. 663). Nistor and Neubauer asserted that unlike other variables that are difficult to measure, such as study habits, participation is "directly and easily observable" (p. 663). To study the participation rates in the university course chosen for their study, Nistor and Neubauer identified five variables of online learning to define participation: (a) registration, (b) organization tasks, (c) email contact with the

instructors, (d) active participation in online discussions, and (e) participation in the course evaluation. They found that three of their five variables displayed significant differences between the completion and the dropout sub-groups: (a) email contact with instructors, (b) participation in the course evaluation, and (c) only some of the organizational tasks (participation in one certain session, personal introduction in the directory).

Factors predicting high school online course completion. Dickson (2005) identified measures of student participation when analyzing the data available from Michigan Virtual High School (MVHS) and found that total student participation was strongly predictive of students' final scores in the MVHS courses. He used the total number of clicks of the student driven mouse on a computer as a measurement of participation. Each student's computer behaviors were recorded by the learning management system giving a proxy for measurement of student participation.

While participation, in its various forms, has been identified as a component or predictor of student performance, it has not yet been determined if a lack of participation is related to student withdrawals. Participation may be directly related to withdrawals if a student is not participating or progressing through the online course or school. These types of students have the potential to lose hope for completion and may feel overwhelmed about falling behind – thus, creating a situation where withdrawal may seem to be the best solution.

Indicators of Participation and Withdrawal from Online School or Course

Participation might be a critical factor in determining if a student was likely to withdraw from an online school or course. In this section, I examined components of

participation that may be related to student withdrawals: (a) attendance, (b) course and lesson completion, and (c) teacher-student communication.

Attendance

Attendance is a measure that has been linked to students withdrawing or dropping out of brick-and-mortar schools entirely (Schoeneberger, 2011; Balfanz, Herzog, & Mac Iver, 2007; Neild & Balfanz, 2006; Alexander, Entwisle, & Horsey, 1997; Kaplan, Peck, & Kaplan, 1997; Rumberger, 1987, 1995; Ensminger & Slusavcick, 1992; Rumberger, Ghatak, Poulos, Ritter, & Dornbusch, 1990; Barrington & Hendricks, 1989). Attendance in a brick-and-mortar setting has been defined as physically attending the classroom or school building for the duration of the class or of the school day. Attendance itself is problematic; a student can attend a brick-and-mortar classroom but be entirely disengaged from school. This disengaged student would most likely turn in very few assignments and would not demonstrate on-task behaviors, such as participating in discussion or taking notes, in the classroom. For the online student, attendance as a measure to predict student withdrawals is even more problematic. Students are not required to attend a physical classroom, so attendance in an online program needs to be carefully defined. For example, attendance could be defined as a student talking on the phone to a teacher without necessarily completing any coursework or it could be defined if a student attends an online synchronous lesson but does not complete any coursework. I was unable to find any studies conducted that defined attendance in online schools or that examined attendance in any method.

Course and Lesson Completion

Course and/or lesson completion is commonly used as a measure of student engagement or "persistence of effort" (Pape, Revenaugh, & Wicks, 2007, p. 4). However, there is no agreement among online schools as to the definition of course or lesson completion or to the way to accurately measure this (Pape, Revenaugh, & Wicks, 2007). While course completion rates are defined and measured differently across online school programs, comparisons using these rates are futile (Hawkins & Barbour, 2010). A few of the factors that impact course completion rates are the school's administrative policy relating to the period of time in which a student can withdraw without penalty and without being counted in the rate (Hawkins & Barbour, 2010) and the administrative policy that defines how a course is counted as completed.

Trial periods as part of course/lesson completion. Hawkins and Barbour (2010) looked at 86 K-12 virtual schools of all kinds (charter, for profit, multi-district, state-led, etc.) in the United States and found that 68 percent of them had trial period policies. Trial period policies effect enrollment data as students who withdraw during a trial period may or may not be included in withdrawal data. Students who withdraw during a trial period may or may not be included in course completion data either. Trial periods ranged from 1 to 185 days. They also found that all but one of the respondents had definitions of course completion. These definitions fell into three main categories: (a) time-based (student earned any grade, passing or not, within a certain amount of time), (b) grade-based (students who passed the course within the allotted time), and (c) brick-and-mortar based (school relied on brick-and-mortar school the student attends to define course completion) (Hawkins & Barbour, 2010).

Watson and Ryan (2007) also found that there was significant variability in how online schools defined course completion from completing a course with a passing grade to deferring to how the local brick-and-mortar schools define course completion. Using a Fisher's exact probability test, Hawkins and Barbour (2010) found that full-time online schools were prone to not calculate course completion rates. Nistor and Neubauer (2010) defined completion as those students who were still enrolled in a university course at the end of the course.

Even with the variety of definitions and ways of measuring course and/or lesson completion, Pierrakeas, et. al. (2004) found that course and lesson completion was a significant indicator of dropout students in an online university. Eighty percent of the students who dropped out of their online courses had not completed a single assignment, and an additional 16 percent of the sample dropped out after having completed only two written assignments.

Roblyer, and his colleagues (2008) used a revised ESPRI (Roblyer & Marshall, 2002-2003) with 2,880 virtual high school students in grades 9-12 to attempt to replicate the findings of Roblyer and Marshall of a significant relationship between student success and this instrument. While Roblyer and Marshall (2002-2003), found that they could predict success based on the ESPRI, they had a more difficult time predicting failure. Roblyer, et. al. (2008) findings were similar and confirmed that they were able to predict success more easily than they could predict withdrawal. These findings speak to the difficulty of identifying students who may be at risk for withdrawing from an online course or school. They found that initial active involvement in online courses predicts success in the course; however, research in K-12 online schools to date has not indicated

if the opposite is true as well – that initial lack of involvement predicts student withdrawal from the online course or school. The relationship of course completion to student withdrawal from online K-12 schools has not been established.

Teacher-Student Communication

Researchers have found that different types of communication between student and instructors/tutors are indicators of either student success in online programs or of student withdrawal from online programs (Nistor & Neubauer, 2010; Pierrakeas, et. al, 2004; Rice, 2006; Ronsisvalle & Watkins, 2005). Ronsisvalle and Watkins (2005) indicated that two factors, which contribute to building online community, are participation and interaction. Pierrakeas, et. al. (2004) found that when online university students were asked their opinion of the tutor they worked with, 23 percent reported communication problems with the tutor. Nistor and Neubauer (2010) found that while frequency of email contact with instructors was not a good predictor of dropping out among university students, overall the dropout subgroup of the population had lower frequency of communication when compared with students who stayed in their online courses.

In K-12 education, communication between student and instructors/tutors may even be more important than in the collegiate studies conducted about university online courses with adults due to the developmental needs of those younger students. Cavanaugh, Gillian, Kromey, Hess and Bloymeyer (2004) asserted that younger students need "more supervision, fewer and simpler instruction, and a more extensive reinforcement system than older students" (p. 7) as well as frequent teacher contact and lessons divided into smaller chunks. They assert that adults have moved through all of the

stages of development identified by Piaget, while K-12 students are still moving through them and instruction should be tailored to their development.

K-12 online teacher-student communication. Hughes, et. al. (2007) used a student survey and found that online high school students perceived more communication support from their teacher than their brick-and-mortar counterparts did. Their study also indicated that the students' self-perceptions of being college-oriented was lower for online students than it was for students who participated in traditional or brick-and-mortar classes. Rice (2006) studied online K-12 schools and found that the "amount of engagement by the adult supervisor seemed to influence the amount of and quality of participation by students" (p 435). Cavanaugh, Gillan, Kromrey, Hess and Blomeyer (2004) asserted that K-12 online teachers must help students become more autonomous and self-regulating in order to increase retention of students at the online school and also to increase student achievement.

Student Academic Performance in Online Versus Traditional Courses

Researchers have repeatedly found that there is no significant difference between student performances in online courses when compared to traditional, or brick-and-mortar courses (Dickson, 2005; Russell, 1999; Bernard, Abrami, Lou, Borokhovski, Wade, Wozney, Wallet, Fiset, & Huang, 2004; Cavenaugh et al, 2004). However, grade point average (GPA) is a significant factor in student success and retention in online courses (Diaz, 2002; Morris, Wu, & Finnegan, 2005; Roblyer, et. al., 2008; Willgang & Johnson, 2009; Wojciechowski & Palmer, 2005). As the online K-12 courses and schools are all options, or choice for students, it seems logical to postulate that students who do

not experience success in the online setting would withdraw from it, unless it is the only option left for them.

Dickson's (2005) work with Michigan Virtual High School (MVHS) pertained to performance as well. MVHS was a selection of courses offered online that issue a percentage score at the end of the course that the student's local school analyzed and decided (a) what grade to issue and (b) if the performance and curriculum were credit worthy. The local school personnel then entered the information onto the student's transcript. Students who took courses through MVHS did so to supplement their full-time school experience in their local school setting. Dickson found that performance in online courses was bimodal; there was a cluster of students whose final scores ranged from 70-100 percent and another cluster of students whose final scores were low, failing scores, including scores of 0, which potentially indicated that the student withdrew from the course (Dickson, 2005).

Hughes, et. al. (2007) conducted a comparative study of students in online and traditional Algebra 1 courses. All students who participated in the study took the *Assessment of Algebraic Understanding*, a 50-question exam aligned with the National Council of Teachers of Mathematics (NCTM) algebra standards. They used *t*-tests and multiple regression to examine differences in algebra performance. They observed higher algebra achievement among the online students, despite that these students were generally older and less inclined to identify themselves as on a college preparatory path (as discussed previously). This conclusion, however, is made without access to *a priori* algebra knowledge, as the researchers asserted, and it was made without any reference to withdrawal policies. If students had the ability to withdraw from the online courses

without consequence, this could potentially explain the higher level of achievement. When analyzing performance in online courses, withdrawal policies should be considered as they may affect the results.

As discussed as it related to course and lesson completion, the findings of Roblyer, et. al. (2008) were even more relevant to performance. They found that students' grade point averages (GPA) were a significant predictor of success in online programs; but that when this predictor was combined with certain learning conditions (such as having a computer at home), it was stronger. Therefore, a higher GPA was a significant predictor of greater success in online courses. Again, Robleyer, et al. (2008) worked with VHS to conduct this study. VHS was an online course provider for a consortium of schools. Students take online courses through VHS to supplement their full-time schooling in a traditional setting.

Student Withdrawals Versus Course Grades

Student withdrawals have a significant impact on studies regarding student performance depending on the withdrawal policy of the online school or program. Some studies reported that student performance in online courses was comparable to traditional courses (Dickson, 2005; Russell, 1999; Bernard, et. al., 2004; & Cavenaugh et al, 2004), while others reported that student performance in online courses was higher than in traditional courses (Hughes, et. al., 2007). However, the withdrawal policy and/or attrition rate may impact these findings significantly. Importantly, no research has directly studied a relationship between student grade performance and student withdrawal.

Research Summary

In order to understand withdrawal rates in online K-12 schools, it is vital to have detailed documentation of these rates and to describe characteristics of the students who withdraw compared to the students who remain enrolled. Once these characteristics are known schools can develop programs and/or policies that support students who are at risk of withdrawing. Student communication with teachers in the online K-12 schools has not yet been linked to student withdrawals; however, because of the links that have been reported in the university setting, it is important to investigate to discover if there is a relationship between student communication with K-12 online teachers or not.

Research Questions

Based upon my literature review, I have chosen five questions in the areas of (a) student attendance, (b) student lesson completion, (c) average lessons completed per day, (d) teacher-student communication, and (e) student performance as it applies to student enrollment status (enrolled versus withdrawn).

Participation

1. Is there a difference between students with differing enrollment status (enrolled, withdrawn) and student attendance?
2. Is there a difference between students with differing enrollment status (enrolled, withdrawn) and student lesson completion?
3. Is there a difference between students with differing enrollment status (enrolled, withdrawn) and student average lesson completion per day?
4. Is there a difference between students with differing enrollment status (enrolled, withdrawn) and teacher-student communication?

Performance

5. Is there a difference between students with differing enrollment status (enrolled, withdrawn) and student performance?

CHAPTER II

METHODOLOGY

Setting

Both schools used in this study were multi-district online charter schools that provided full time programs for students across their respective states (Watson, et. al. 2010). They both used the same Education Management System (EMS) and Adobe Connect synchronous lesson platform. All students were required to have an adult Learning Coach (LC) in their home with them who guided them through the curriculum and set up physical components of the lessons. The EMS contained all of the instruction and supports for students; however, if a student needed help or clarification, the teacher could supplement the curriculum with written instruction, synchronous lessons, phone instruction, and pre-recorded lessons. There were also many supportive programs that teachers could assign to students to help them with skills or concepts that they struggled with—from Head Sprout (a phonics based reading program) to Discovery Education (subject-specific videos). The EMS captured student related data: lesson completion, days enrolled, emails sent between teacher and student, performance specific to subject areas, performance across subject areas, last login date, and other key dates (date first assessment completed, last assessment completed, etc). LCs entered the amount of hours students worked each day as some of the work—especially in the lower grades—was completed on paper rather than online. All student demographic information was entered into the EMS by administrative assistants based on the enrollment documents collected as a part of the enrollment process.

In accordance with No Child Left Behind (2001), all teachers were highly qualified and fully licensed in the state. Teachers graded all assignments using the grade-book in the EMS. Some assessments were more automated than others, but all assessments had components that required teacher grading and automated grades could be changed by the teacher (for example, a teacher could have issued half of a point for getting a portion of the answer correct). Teachers also communicated with students by email (all within the EMS and in the student information), by phone, or via synchronous lessons. Teachers entered phone and synchronous contact information into the EMS. Teachers also provided synchronous lessons for students. These ranged from drop-in office hours to targeted direct instruction for students.

In the same way that school personnel could view and use these student level data, the EMS captured data regarding teacher performance as well. Data such as last login, amount of ungraded assessments, oldest ungraded assessment, contact with students by phone, contact with students by email, and other similar items are all captured and reported on documents provided. Any synchronous lesson could be recorded if the teacher chose to do so and attendance to synchronous lessons was automated; however the lesson software did not import this information directly into the EMS, so teachers entered it manually.

The curriculum accessed by the students through the EMS was built around textbooks that brick-and-mortar schools also use from well-known publishers such as Prentice Hall and Glencoe. Asynchronous lessons included instructions for the LCs, instructions for the student, online tools and tutorials, and directions regarding the textbook for the course. Assessments varied from portfolio assessments that were

scanned or mailed to teachers to multiple-choice tests that included short answer questions.

Operationalization of Variables

In this study, *enrollment status* was the dependent variable. *Enrollment status* was coded as ES2 and was a nominally scaled variable with two levels: *enrolled and withdrawn. Enrolled* referred to students who had fully enrolled in the school and completed at least one assessment. *Withdrawn* referred to students who had withdrawn from the school and completed at least one assessment while they were enrolled.

Attendance, lesson completion, average lessons completed per day, teacher-student communication, and student achievement were the independent variables. *Attendance* was the number of hours each day that represents the amount of time the student spent on his/her schoolwork that day. *Lesson completion* represented the amount of lessons a student completed when compared to the total in a percentage. *Average lessons completed per day* was portrayed as a percentage, with most recent days enrolled over lessons completed. Teachers were required to have synchronous contact with their core-area students at least two times per semester for a minimum of 8 synchronous contacts each semester (2 from each core-area teacher—English, Social Studies, Science, and Math). *Teacher-student communication* was represented as a percentage of teacher-student contacts completed compared to those required. Finally, *student performance* was measured as an overall percentage earned in all of the courses for which the student is active.

Participants

The participants of this study were students from two online full time K-12 public charter schools with similar structure in separate states, with approximately 1700 enrolled students each school (3500 students total including enrolled and withdrawn over the course of one full school year). Both schools were in the central region of the United States. Table 1 displays the total number of enrollments (including both enrolled and withdrawn students) for each school during the course of the 2011-12 school year. These data were extracted on March 23, 2012.

Table 1

Characteristics of Schools A and B

Characteristic	School A	School B
Grades K-6 Enrollment	752 students	673 students
Grades 7-8 Enrollment	407 students	379 students
Grades 9-12 Enrollment	632 students	657 students
Total Enrollment	1791 students	1709 students

Figure 2 shows the ratio of students who remained enrolled versus those who withdrew. In School A, 28.5 percent (n = 511) of the total student enrollment withdrew whereas 20.7 percent (n = 354) of the total student enrollment withdrew in School B.

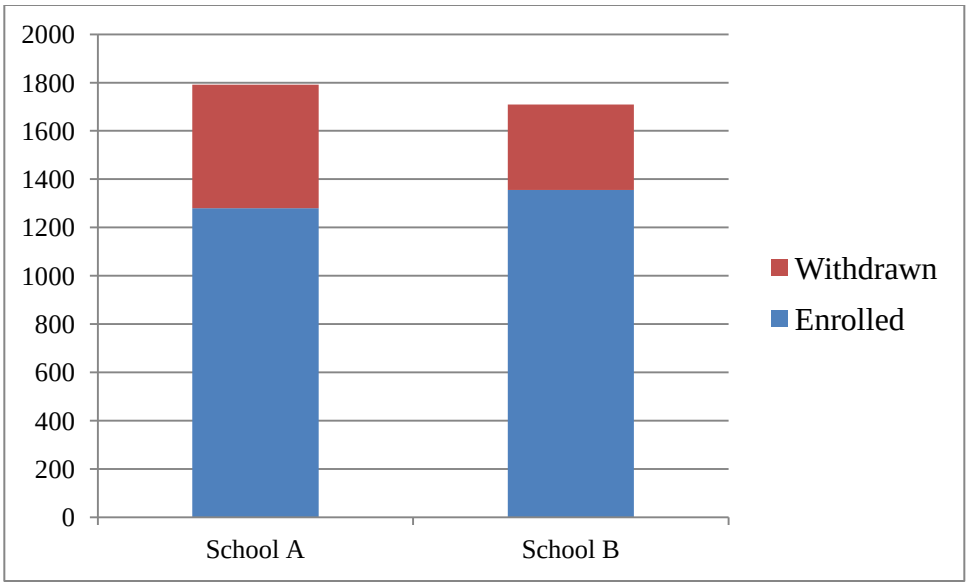

Figure 2. Number of Enrolled and Withdrawn students at each school, shown as a part of the total student population.

Gender of Participants

Table 2 shows the gender of the students in both schools was almost evenly distributed. Fifty-one percent of the total student enrollment when both schools are combined were female (*n* =1785). Forty-nine percent (*n* = 1715) of the total student enrollment were male. Table 2 lists the exact breakdown of student gender by school and by enrollment status.

Table 2

Gender of Total Student Enrollment in Schools A and B

Characteristic	Female	Male	Total
School A Enrolled	648	632	1280
School A Withdrawn	258	253	511
School B Enrolled	699	656	1355
School B Withdrawn	180	174	354
Total Enrollment	1785	1715	3500

Figure 3 visually displays the distributions shown in Table 2. Again, you can see that almost half the students were male and half were female.

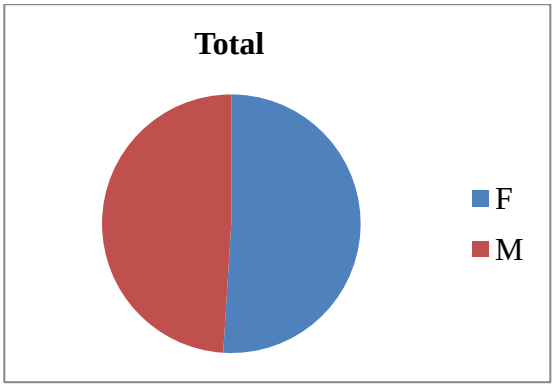

Figure 3. Gender of participants, shown as part of total student participation.

Ethnicity of Participants

Table 3 shows the breakdown of the ethnicity of the student participants by both school and enrollment status with 74.89 percent (*n* = 2621) of the total student enrollment in both schools combined identified themselves as White, 12.1 percent (*n* = 425) of the total student enrollment in both schools combined identified themselves as Hispanic, 5.57 percent of the total student enrollment in both schools combined identified themselves as Multiple Race, and 4.6 percent (*n* = 161) of the total student enrollment in both schools combined identified themselves as Black/African American. The rest of the total student enrollment in both schools combined identified themselves as American Indian or Alaskan Native (*n* = 47), Asian (*n* = 43), and Native Hawaiian or Other Pacific Islander (n = 8).

Table 3

Ethnicity of Total Student Enrollment in Schools A and B

School	Ethnicity	Enrolled	Withdrawn	Total
School A	American Indian or Alaskan Native	13	9	22
	Asian	16	3	19
	Black/ African American	53	20	73
	Hispanic or Latino	215	106	321
	Multiple Races	51	24	75
	Native Hawaiian or Other Pacific Islander	6	2	8
	White	926	347	1273
School B	American Indian or Alaskan Native	15	10	25
	Asian	18	6	24
	Black/ African American	58	30	88
	Hispanic or Latino	75	29	104
	Multiple Races	95	25	120
	Native Hawaiian or Other Pacific Islander	0	0	0
	White	1094	254	1348
Total Enrollment		2635	865	3500

Figure 4 displays the ethnicity of all of the student participants combined. The majority of the students and families in School A and School B identified themselves as white.

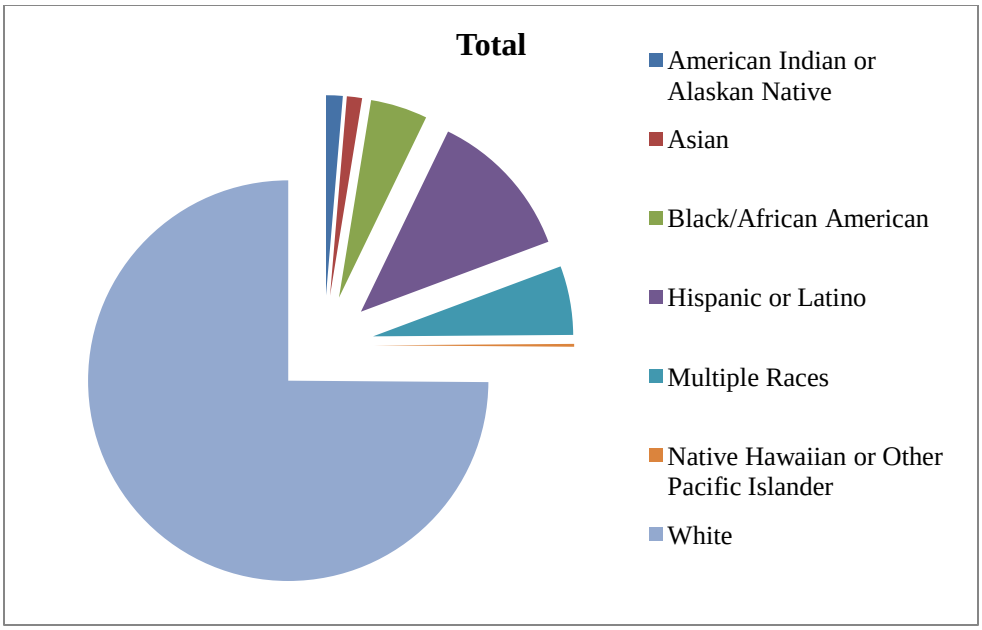

Figure 4. Ethnicity of participants, shown as part of total student population.

Socio-economic Status of Participants

Approximately 44 percent (*n* = 1547) of the total student enrollment in both schools combined qualified for free or reduced lunch. In School A, 42 percent (*n* = 756) of the enrolled students qualified for free or reduced lunch. In School B, 46.2 percent (*n* = 791) of the enrolled students qualified for free or reduced lunch. Figure 4 shows the Socio-economic status of the students by school and by enrollment status (enrolled or withdrawn). The amount of students who qualified for free and reduced lunch status and withdrew from both School A and School B were similar in number to those who withdrew and did not qualify for free and reduced lunch status. However the number of students who were enrolled from School A and School B and qualified for free and reduced lunch was much lower than the amount of students who were enrolled in School A and School B and who did not qualify for free and reduced lunch, as shown in Figure 5.

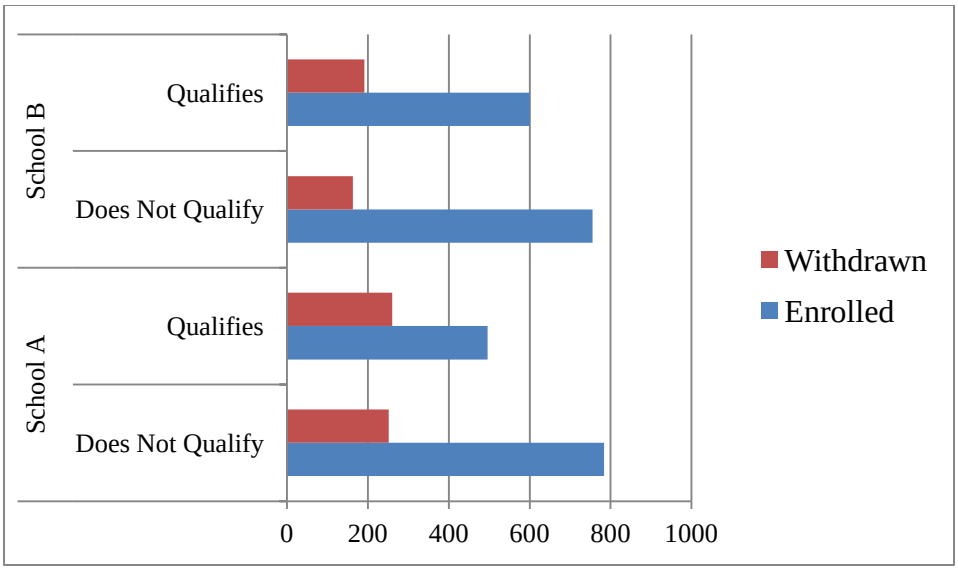

Figure 5. Comparison of Enrolled and Withdrawn students by school who qualify for free and reduced lunch and are enrolled or withdrawn.

Overview of Research Design

This was a descriptive quantitative analysis using extant data. Data was pulled on March 23, 2012 to capture students with the status of *enrolled or withdrawn* for that school year.

Procedures

Data were collected from students during the enrollment process (demographic data) and then throughout their time with the school. Socio-economic status data were collected during the enrollment process; however, each family had the option not to complete the associated form. Families that did so were rewarded by the school and given a computer for in-home use if they qualified for free or reduced lunch. A Learning Coach entered attendance data into the EMS. Learning Coaches all received the same asynchronous orientation training regarding how to input attendance; however, not all of them completed the orientation. While the attendance marked by the Learning Coach was flexible, each state had a certain number of hours per week that they recommended

students work to meet state reporting guidelines. The hours recommended by each school for full time enrollment are on Table 4.

Table 4

Recommended Attendance Hours per Week

Grade(s)	School A: Recommended Hours per week	School B: Recommended Hours per week
K	13	12
1 – 5	28	27
6 – 12	30	30

Full time students should have completed at a minimum 5 lessons per school day, with the school year having 180 school days total. Kindergarten students were part time students and therefore should have completed a minimum of two lessons per day. The lessons a student completed were captured in the EMS automatically. Teachers entered detailed information about synchronous contacts in each student's log. Student achievement data was collected from student grade books as teachers graded and recorded the grades of their assessments and portfolios.

Data Analysis

To analyze the variables relating to student participation, I conducted a series of independent samples *t*-tests. I verified that the population met the criteria for the independent samples *t*-test by drawing a histogram of the populations and using simple descriptive statistics (mean scores, and standard deviation). To account for performing multiple *t*-tests on the same data, I adjusted the *p*-value using the Bonferroni method. Table 5 displays the data and analysis of the variables related to participation: attendance, lesson completion, participation (average lessons completed/ days enrolled), and teacher-student phone contact.

Table 5

Data Analysis for Student Participation

Relationship	Data Description	Analytic
ES2/Attendance	Nominal 2 Category to Attendance Mean Hours by Category (In Percentage of Total Possible)	*t*-test
ES2/Lesson Completion	Nominal 2 Category to Mean Lesson Completion Rate by Category (In Percentage of Total Possible)	*t*-test
ES2/Average Lesson Completion per Day	Nominal 2 Category to Mean Participation Completion Rate by Category (In Percentage of Total Possible)	*t*-test
ES2/Student-Teacher Phone Contact	Nominal 2 Category to Mean Contact rate	*t*-test

To determine if there was a statistically significant difference between enrollment status and overall performance, I performed an independent samples *t*-test. To ensure that the study population met the criteria for this test, I determined that the study population was drawn from a normally distributed population and reviewed descriptive statistics, including the mean, and standard deviation. Table 6 below shows the analysis and variables as related to student performance.

Table 6

Data Analysis for Student Achievement

Relationship	Data Description	Analytic
ES2/Student Performance	Nominal 2 Category to Percentage Student Achievement Score Mean by Category (In Percentage of Total Possible)	*t*-test

CHAPTER III

RESULTS

In this chapter, I present statistical data that answers each research question in their numbered order. For each question, a means table followed by a graphical display of the score distributions is provided. Tests of the five analyses using independent samples t-tests were conducted using the Bonferroni adjusted alpha levels of .01 per test (.05/5).

Question One – Student Attendance

I used an independent samples *t*-test to compare student enrollment status by mean hours of attendance (in percentage of total possible). There was a significant difference in mean hours of attendance on enrollment status of enrolled and withdrawn. Results indicated that the Enrolled group had significantly higher mean hours of attendance versus the Withdrawn group. These results showed that attendance hours were a factor in student enrollment status in online K-12 schools. Table 7 provides a complete means table.

Table 7

Means Table for Student Attendance

Student Enrollment Status	*n*	Range of hours	*M*	SD
Enrolled	2639	0-150	106.60	17.83
Withdrawn	861	0-150	85.54	33.61

$t(3498) = 23.596$, $p = <.01$

Figure 6 shows the distribution of the mean attendance hours of enrolled students and withdrawn students. The attendance means of the students with a status of enrolled were normally distributed while the attendance means of the students with a status of withdrawn were positively skewed.

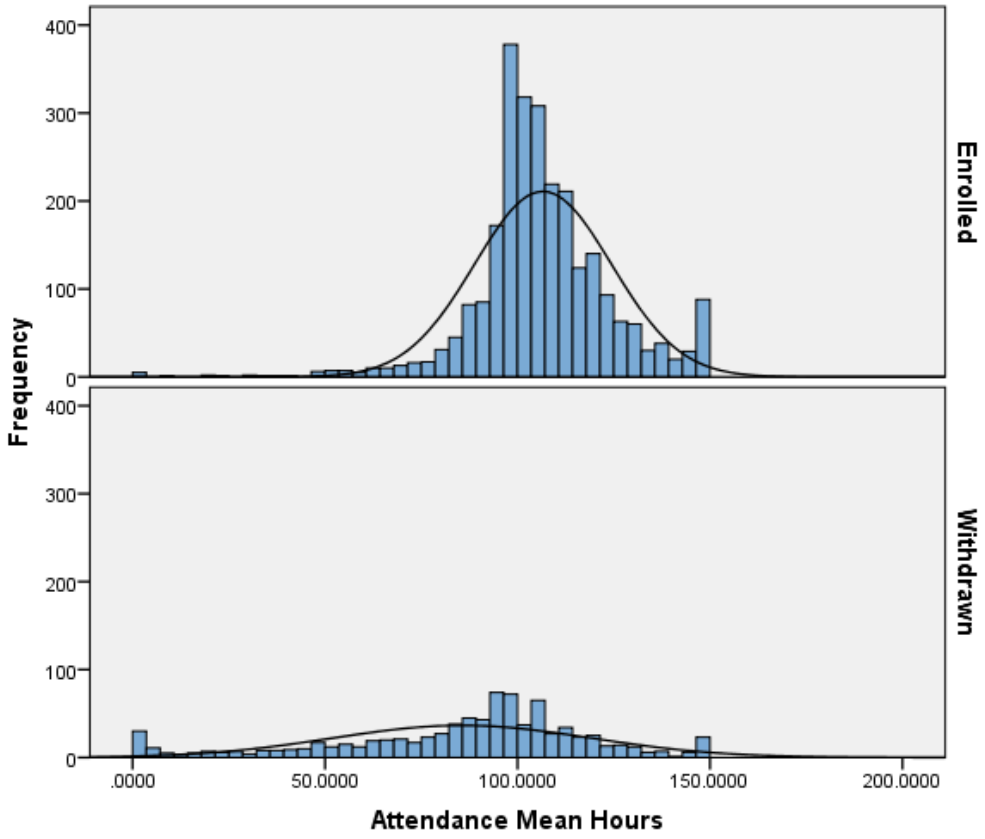

Figure 6. Histogram of mean hours of attendance for Enrolled and Withdrawn groups.

Question Two – Lesson Completion

There was a significant difference in mean lessons completed (in percentage of total possible) for enrollment status of enrolled versus withdrawn. Results indicated that the Enrolled group had significantly higher percentage of mean lessons completed versus the Withdrawn group. These results showed that the percentage of lessons completed is a factor in student enrollment status in online K-12 schools. Table 8 provides a complete means table.

Table 8

Means Table for Lessons Completed

Student Enrollment Status	*n*	Range of lessons completed	*M*	SD
Enrolled	2639	0-100	64.45	19.09
Withdrawn	861	0-100	47.86	32.01

t(3498)= 18.413, *p*=<.01

Figure 7 shows the distribution of the mean percentage of lessons completed of enrolled students and withdrawn students. The mean percentage of lessons completed by students with a status of enrolled were negatively skewed while the mean percentage of lessons completed of the students with a status of withdrawn were bimodal.

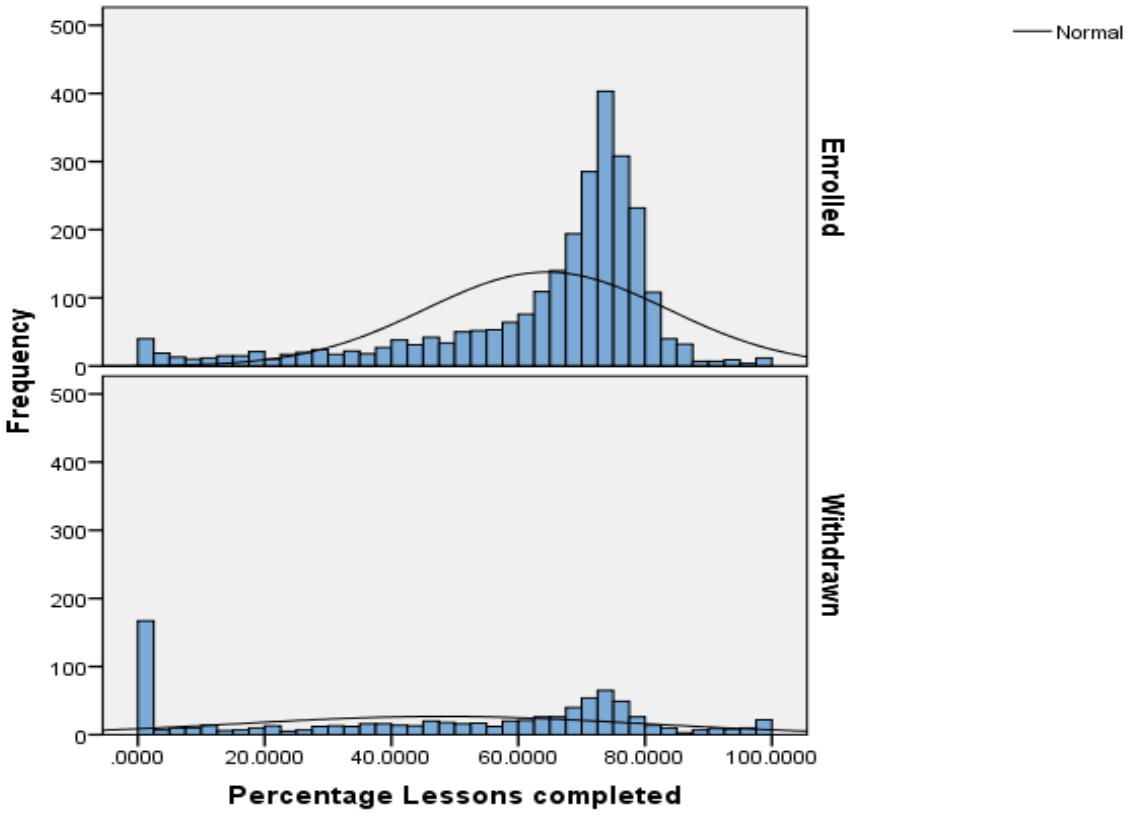

Figure 7. Histogram of mean number of lessons completed by Enrolled and Withdrawn groups.

Question Three – Average Lessons Completed per Day

After running the independent samples *t*-test it became apparent that the data for average lessons completed were not sufficient to test this question. I needed two types of data that could not be appropriately combined. Data for average lessons completed was cumulative throughout the school year. This was a benefit to students who withdraw and later return to the school. When they did so they were able to either start on the lesson that followed the last one they completed or their teacher was able to make adjustments to reflect the additional student learning acquired while they were enrolled at another school. But the data for days enrolled reflected only the most recent days enrolled. The mean average lessons completed per day by the students with a status of enrolled and withdrawn were normally distributed; however, there was an unusual range in the withdrawn variable. Completing 666.4 lessons during the school year until March 23 indicates problems with the data. The calculation of enrolled days included only the most recent consecutive enrolled days during the school year; that is, if a student withdrew and re-enrolled, the days that the student was enrolled prior to the first (or more) withdrawal were not added into the 'days enrolled' calculation. However, the lessons completed metric included the lessons a student completed throughout the course of the year (in total). Though these data were captured in this way, it was reasonable to use the means of the data as the mean lessons completed of the enrolled group was approximately what students should be completing (M= 5.83, SD = 7.87). The withdrawn student data showed that there were quite a few students whose lesson completion rates were either skewed or unreasonable (M= 13.06, SD = 38.03). Because I used extant data that did not include

student identity, I was not able to further analyze these data to review the reasons why these data were skewed.

Question Four – Teacher-Student Communication

An independent samples *t*-test compared mean teacher-student synchronous contact rate (communication) for enrollment status of enrolled versus those with the enrollment status of withdrawn. There was a significant difference between enrolled and withdrawn. Results indicated that the Enrolled group had significantly higher mean of teacher-student synchronous contact versus the Withdrawn group. Table 10 provides a complete means table.

Table 9

Means Table for Mean of Teacher-Student Synchronous Contact

Student Enrollment Status	*n*	Range	*M*	SD
Enrolled	2639	0-398	66.89	57.13
Withdrawn	861	0-172	21.25	25.33

$t(3498)=22.724$, $p=<.01$

Figure 9 shows the distribution of the mean of synchronous contacts between teachers and enrolled students and withdrawn students. The mean of synchronous contacts between teachers and students with a status of enrolled were positively skewed in much the same manner that they were for students with a status of withdrawn.

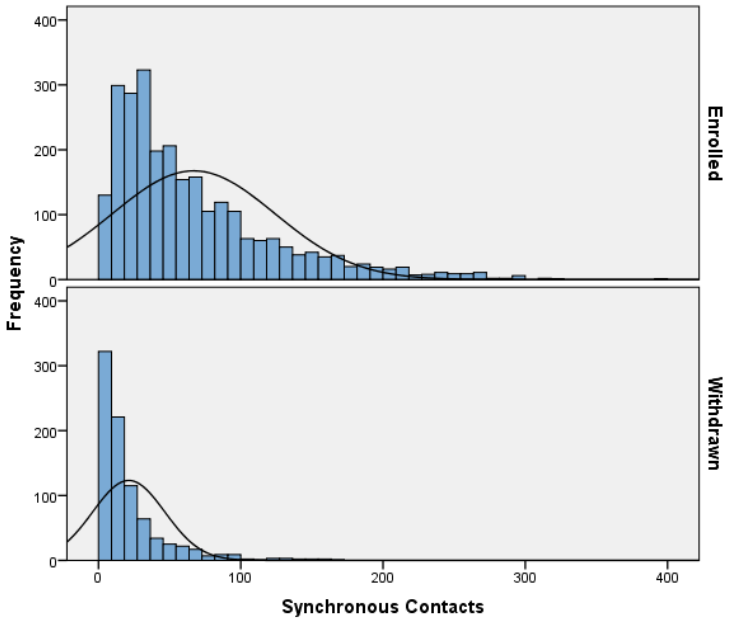

Figure 8. Histogram of mean number of synchronous contacts between teacher and student by Enrolled and Withdrawn groups.

Question Five – Student Performance

An independent samples *t*-test evaluated mean overall performance percentage (in percentage of total possible) in students for the enrollment status of enrolled versus those with the enrollment status of withdrawn. There was a significant difference between enrolled and withdrawn. Results indicated that the Enrolled group had significantly higher mean overall performance percentage versus the Withdrawn group. Table 11 provides a complete means table.

Table 10

Means Table for Student Performance

Student Enrollment Status	*n*	Range	*M*	SD
Enrolled	2639	0-102	80.46	16.25
Withdrawn	861	0-100	58.59	28.08

$t(3498)=28.11$, $p=<.01$

Figure 10 shows the distribution of the mean of the performance percentage for enrolled students and withdrawn students. The mean of the performance percentage for students with a status of enrolled were negatively skewed; the mean of the performance percentage for students with a status of withdrawn were related to the normal curve.

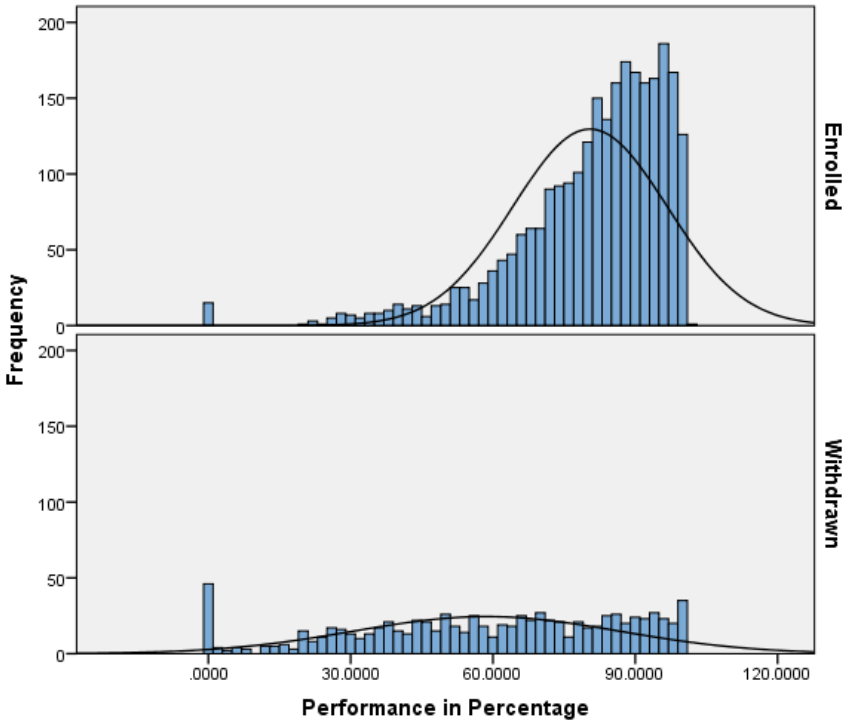

Figure 9. Histogram of mean overall performance in percentage by Enrolled and Withdrawn groups.

Summary of Findings

Four of the variables: (a) attendance, (b) lessons completed, (c) teacher-student communication, and (d) overall performance percentage were significant at the p=<.01 level. The Enrolled group had significantly higher means in the following variables: (a) attendance, (b) lessons completed, (c) teacher-student synchronous contact, and (d) overall performance percentage. Due to the way in which the data were collected, results were not appropriate to report regarding participation, or average lessons completed per day.

CHAPTER IV

DISCUSSION

As online K-12 schools continue to grow across the nation, it is important to study the student enrollment status and variables that contribute to students remaining enrolled or withdrawing so as to ensure that K-12 online schools are equitably serving K-12 student populations. The primary purpose of my study was to analyze whether there were significant indicators related to student enrollment status. In my study, I answered the following research questions: (a) *Is there a difference between students with differing enrollment status and student attendance?* (b) *Is there a difference between students with differing enrollment status and student lesson completion?* (c) *Is there a difference between students with differing enrollment status and average lessons completed by students per day?* (d) *Is there a difference between students with differing enrollment status and teacher-student communication? and, (e) Is there a difference between students with differing enrollment status and student performance?* I found a significant relationship among the variables in four of the five research questions. The findings of my study have the potential implications to develop, guide, and impact implementation of online school practices and policies so the schools and staff therein can better serve all students.

Major Findings

Attendance

As I anticipated, students in the Enrolled group had a significantly higher mean of hours of attendance (in percentage of total possible) than students in the Withdrawn group. Students in both schools did enroll throughout the year and withdraw throughout

the year, so using a *t*-test was the best method of comparing the means. This finding is of particular interest because it is the Learning Coach (who is often a parent) who enters the hours the student is attending. School A and B also communicated the hours students are expected to work (see Table 4) to the Learning Coaches. School staff monitor attendance for accuracy; however, Learning Coaches could potentially enter the amount of expected hours rather than the amount of actual hours a student is attending. This finding shows that the hours that a Learning Coach is entering for a student are useful in identifying students who may withdraw and that schools can use these data to identify students with whom they need to work more closely in order to remain enrolled. Attendance has been identified as a measure that is linked to students withdrawing or dropping out of K-12 brick-and-mortar schools (Schoeneberger, 2011; Balfanz, Herzog, & Mac Iver, 2007; Neild & Balfanz, 2006; Alexander, Entwisle, & Horsey, 1997; Kaplan, Peck, & Kaplan, 1997; Rumberger, 1987, 1995; Ensminger & Slusavcick, 1992; Rumberger, et. al, 1990; Barrington & Hendricks, 1989), and my finding shows that this is true in K-12 online schools as well.

Students who spend more time working in the school are investing more of their resource of time, which may make them less inclined to withdraw. Students who spend less time in school are less invested—especially in online schooling where the entire curriculum, instruction, and socialization opportunities are, for the most part, integrated into the online school experience (as opposed to brick-and-mortar where students may invest time socializing at school and getting to and from school but may not be invested in school itself). Learning Coaches who enter less than the amount of attendance required by the local school, district, and state, are essentially supporting their student not

investing the required time. This action signifies a potential lack of support from the parent or caretakers.

In these two schools, current practice related to attendance is that advisory or homeroom teachers monitor and track student attendance in compliance with local state law. In addition to monitoring and tracking, interventions can be identified and used with students who are not attending. Interventions should be developed that are based on (a) ensuring students experience success and (b) engaging students in their achievement and progression. Online K-12 schools should use benchmark pre-tests to identify academic areas in which students may need more support; however, they should also provide many opportunities to help students understand how concepts, skills and projects relate to real-life experiences (thus creating an engaging environment). For any interventions that are developed and implemented, research should be conducted to analyze the results of the identification and interventions created.

It would also benefit both these schools and future research possibilities to be able to review attendance hours per enrolled days (cumulative throughout the year even if the student withdraws and re-enrolls). These data would allow for more specific statistical review and analysis. It would also allow the schools to review this information and support students and Learning Coaches both daily and weekly in regards to attendance.

Lessons Completed

My study confirmed that the mean amount of lessons completed (in percentage of total possible) was significantly higher for the Enrolled group of students. My results supported the finding of Pierrakeas, et. al. (2004) who found that lesson completion was a significant factor of dropout online students at the university level; this is also true at the

K-12 level as well. Students who fall behind in completing lessons may feel overwhelmed at the prospect of trying to catch up. Students in online K-12 schools have visibility into the curriculum and how much more they need to complete in order to complete the course in a way that they may not have in brick-and-mortar schools.

Currently, advisory and/or homeroom teachers monitor lesson completion and work with students to strategize how to best complete their lessons. Advisory and/or homeroom teachers need to communicate directly and frequently with students and Learning Coaches regarding the importance of completing a full day's worth of lessons (all of the lessons that populate on the student's planners) and how completing these lessons effects their progress through the curriculum.

Participation

The total amount of lessons completed included all lessons completed during the school year; however, the days enrolled variable only included the most recent enrollment. Therefore, if a student withdrew and reenrolled, the average lessons per (enrolled) day would be inaccurate. Review of the means of the data indicated that students in the Withdrawn group (a) may be actually completing more lessons per day than the Enrolled group or (b) their scores may have been inflated by the data keeping system. These data need to show more accurately the lessons completed (cumulative through the school year) compared to days enrolled (cumulative through the school year). Data should also include the number of times one student re-enrolls so that this can be reviewed when the data are analyzed.

Teacher-Student Communication

Students in the Enrolled group had a significantly higher mean of synchronous contact than did students in the Withdrawn group. This finding is consistent with the findings at the university level (Nistor & Neubauer, 2010; Pierrakeas, et. al, 2004; Rice, 2006; Ronsisvalle & Watkins, 2005).

Teacher-student communication is vital for students to experience success. Attending online school can feel very isolating unless there is ample opportunity to interact with others—and teachers provide this opportunity. Online K-12 schooling is a very different experience from brick-and-mortar schooling; students and Learning Coaches need instruction and guidance to be able to have students experience success.

At these two schools, current practice is that teachers conduct a welcome call within one week with each student and encourage students to interact via email. Because of the significance of this finding, teachers should be encouraged to interact synchronously with students as often as possible – on a weekly basis would be ideal, whether it is opening their virtual classrooms for students more often during the day or calling them on the phone. Virtual classrooms are currently optional for students to attend and participate in; however, the findings here suggest that providing more opportunities and even requiring use of them would increase teacher student communication and likely improve overall student success.

Overall Performance Percentage

My research findings confirmed that mean overall performance percentage was significantly higher for the Enrolled group of students. This finding supports the findings of others that student achievement is a significant factor in student success and retention

in online courses (Wojciechowski and Palmer, 2005; Roblyer, et. al., 2008; Willgang & Johnson, 2009).

If a student is not experiencing success, it is relatively easy for the student to withdraw from an online school – there is no cost to the family (hence, no loss of personal money) and there are compulsory attendance laws that would extrinsically motivate the students to remain with a school of choice (as there are with neighborhood or district schools). Students can withdraw and return to their local schools at any time, and students who are not successful are more inclined to do this (or withdraw and look for a different school of choice). In my experience, there are many families who move back and forth between online schools of choice.

Current practice at these two schools is to identify students who need academic interventions throughout the year and then use a multi-tiered system to support students and provide appropriate interventions. Students are identified using both formative and summative assessments as well as conversation with the student and Learning Coach throughout the school year. Something that may need to be considered in practice is how the gradebook works, which is on a point system. Therefore, if a student is not successful on the first assessment, that student would need to do enough passing work to compensate for the failing work. There are many other ways to have gradebooks set up so that the student is encouraged to redo work or revisit concepts for mastery while not carrying failure—and online schools should look into how to best assess students and maintain the integrity of the program as a whole while still encouraging students to learn and raise their achievement.

Study Limitations

I have identified three potential threats to the validity of my study. Those threats included internal, external, and construct validity issues.

Threats to Internal Validity

Instrumentation. For the attendance variable, there is a threat to internal validity due to the accuracy of the observers, which in this case, are the Learning Coaches. As noted earlier, most Learning Coaches are one of the student's parents. Due to state requirements regarding mandatory attendance, Learning Coaches are aware that there is a minimum amount of attendance they need to enter in order to be in compliance. Therefore, the hours they input may or may not reflect the actual hours the student is working because the parent wants to avoid the legal requisites of mandatory attendance law. Due to the nature of the school work (a combination of printed text and workbooks and online printed, asynchronous, and synchronous instruction) there is no way to have the LMS collect attendance data. Some schools use amount of time logged in to the LMS for attendance; however, if a student is reading text offline, this time should be incorporated, but the LMS does not delineate different hours (online or offline) of attendance.

Mortality – leaving the online charter school. Due to the use of extant data, there was no way to follow up with the students. It was not possible to identify reasons the students may leave and establish why the Withdrawn group is different; it was only possible with these data to establish that they are different. One could logically conclude that those students that stay are different on multiple [unmeasured] factors from those students that leave. For example, students that stay may be more intrinsically motivated

by independent study than those that leave. Conversely, the leavers may be more extrinsically motivated and require more day-to-day and hour-to-hour curriculum and lesson guidance, like that provided in bricks-and-mortar schools.

Selection. Selection was a possible threat to validity due to the fact that the students and schools were not randomly selected. The sample used was a convenience sample; that is, schools and students where extant data was accessible to the researcher. The schools were similar in demographics of student population but may not be similar to other online K-12 school student populations around the nation. Not only was the sample not randomly selected, it also included volunteer participants. Students chose to participate in the online K-12 schools involved in this study and should then be considered volunteers, which may be a further limit to the external validity of this study. Volunteers are problematic as they may share characteristics that cause them to choose or volunteer to participate (Parker, 1990).

Threat to External Validity

Interaction of selection and treatment. Because the sample consisted of volunteers (students who chose to participate in an online K-12 charter school), the results of this study are limited in their generalization to other populations. The results may not be comparable to students enrolled in part time online courses, district-run online schools, brick-and-mortar schools or to students who left the school. The only accurate comparison to be made from the results of this study would apply to other full time students in public online K-12 charter schools.

Threat to Construct Validity

Mono-operation bias. For the purpose of this study, I limited each variable to one definition. With many variables, different definitions could apply. One example is with attendance. Some states require that attendance be recorded as being present for the day or half day rather than in hours. Furthermore, other schools or K-12 programs may use varying definitions of attendance. Another example is with the participation metric used in this study. This metric was defined as average lessons completed through the school year per most recent enrolled days. There are other ways to define participation, such as student interaction in the online learning community through message boards, amount of clicks a student uses in the online program, and a host of others.

Confounding levels of lessons completed and days enrolled. The levels of the variables of lessons completed and days enrolled were a threat to the results in the participation variable as the LMS reported the number of lessons completed during the course of the school year, while the days enrolled variable only showed the most recent number of school days enrolled. For this metric, the numerator was the total number of lessons completed during the school year and the denominator was the total days most recently attended. This metric may have been biased towards students with multiple online charter school enrollments during the academic year. For example, if (a) a student was enrolled for 15 days during the first quarter of the school year and completed 10 lessons, but (b) then left the online charter school and re-enrolled in a bricks-and-mortar school until reenrolling in the online charter school during the third quarter for only three days and completed three lessons, (c) the LMS metric would list 13 lessons for the numerator, but three days as the denominator. Because the LMS' algorithm did not parse

out the Withdrawn group's lessons completed each enrollment time, there was no way of knowing whether the Withdrawn group actually completed more lessons per day or their accumulated lessons unfairly benefited them.

Implications for Future Research

This study provided an initial description of the students who enrolled and/or withdrew from two online K-12 charter schools. More research will need to be done in this field as online school enrollment continues to grow. This study will need to be replicated to ascertain further validity of the results therein. Conducting this study on a larger population or sub-populations will produce more information about the consistency of the results across populations. It would also be valuable to combine variables and test for significance. Additionally, the role of the Learning Coach as related to student enrollment and success needs to be carefully analyzed to provide more information about this support position that is unique to online K-12 public charter schools.

Finally, unidentified variables need to be examined as related to student enrollment and withdrawal from online K-12 schools. For example, what effect does the economy have on the ability of students to have a Learning Coach? Does Learning Coach behavior when entering student attendance hours have a relationship with the level of support the LC provides? What effect do teacher characteristics have on student enrollment? What effect does teacher quality have on student enrollment? Do different components of online K-12 school programs, such as student orientations, impact student enrollment? How strong is the internal locus of control in online enrolled students compared to online students who withdraw? How many students withdraw because they miss socializing at school?

An important area for future research is to use the findings here to develop predictive benchmarks to classify students who are at-risk of withdrawing. Because the sample sizes are fairly large and the outcomes significant these findings form an initiation foundation from which to develop benchmarks for various types of interventions aimed at students who are demonstrating a potential for poor outcomes with their online education.

Conclusion

Research in this growing area of online K-12 education is sparse. There is a lack of common metrics across the online charter schools, so generalizing results from one study to another study or another site is problematic. The goal for access for K-12 online learners is ensuring that they not only have the opportunity to participate in online learning, but that they are able to achieve success (Moore & Fetzner, 2009). The purpose of this study was to determine if (a) attendance, (b) lessons completed, (c) participation, (d) teacher-student contact and (e) overall performance were related to student enrollment status. The results of my study indicate that (a) attendance, (b) lessons completed, (c) teacher-student contact and (d) overall performance are highly significant as related to student enrollment status. Though these results may seem obvious to educators, they give us important information about online K-12 instruction. As online, full-time, public, K-12 charter schools continue to grow and span the nation, online programs need to build and/or implement specific programs to monitor and support students in these important areas.

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