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Bridging the High School Transition: Assessing the Impact of a Freshman Academy on Student Success

Abstract

This paper focuses on quantitatively assessing the implementation of a freshman academy on multiple educational outcomes for students including academic, behavioral and emotional indicators. Existing research presents mixed findings on the effectiveness of freshman academies on student success, and rarely attempt to measure indicators other than grades or standardized test scores. This study examines not only students' grades and credits attained, but also attendance, behavior referrals and most innovatively, students' emotional engagement and connectedness. Data from cohorts prior to and post-freshman academy implementation were quantitatively analyzed using a causal-comparative design. Welch t-tests revealed that academic achievement indicators did not differ significantly between pre- and post-freshman academy implementation, while the freshman academy implementation had a positive, statistically significant impact on behavioral engagement indicators. Emotional engagement indicators showed minimal differences between construct scales, however examination of county and state survey results for the same years revealed significant decreases, showing that the freshman academy had a buffering effect from a broader, downward trend in student emotional engagement statewide.

Keywords

Freshman Academy, Program Evaluation, Ninth-Grade Transition, High School Transition, Academic Achievement, Student Engagement

Author Bio

Victoria A. Honetschlager, Ed.D., is a ninth-grade physics and AP Physics teacher. After completing her Bachelor of Science in Physics, she determined she wished to make the content she loved accessible to all students and began a career path in education. She received her master's degree in teaching from Minnesota State University Mankato and earned a Specialist and Doctorate in Educational Leadership from Minnesota State University Moorhead. Passionate about educational leadership, Dr. Honetschlager serves as the team and intervention lead for her high school's freshman academy and works with the American Physical Society as a national ambassador with the STEP UP program, providing training and resources for teachers to make their physics classrooms more inclusive with the goal of encouraging underrepresented groups to pursue physics studies at the college level. Her research interests include program impact evaluation studies, K-12 school leadership and factors affecting school improvement and students' educational attainment.

Introduction

The start of high school is a critical time for students; a successful transition from middle to high school can help students form lasting attitudinal dispositions towards school and increase students' likelihood of graduating from high school. The large, impersonal nature of most high schools, however, offers little support for incoming freshman, especially for those entering high school with weak social and academic preparation. The current high school reform movement has drawn attention to practices that schools might use to ease ninth graders' transition into high school, such as the 'school-within-a-school' and freshman academy models. Though they are utilized as a transitioning tool for ninth graders upon entering high school, little is quantitatively known about their impact on student outcomes. This study begins to address that gap in the literature by investigating the impact of a freshman academy model on freshman academic achievement and engagement, crucial factors in ninth grade success. Using quantitative academic performance data collected from the universe of a suburban, public high school in the state of Minnesota, the impact of the implementation of a freshman academy model on student academic achievement and engagement is examined.

Background

Though the literature shows the importance of the successful completion of high school, public high schools in the United States are dealing with increasing student absenteeism and failure of core subjects (McCallumore & Sparapani, 2010). While these patterns are seen across all grade levels, the first year of high school is a 'make-or-break' year for high school completion. The transition from middle school to high school is a persistent problem (Hertzog & Morgan, 1999; Neild, 2009; Weiss & Bearman, 2007). McCallumore and Sparapani (2010) stated, "statistics generated from freshman year are concerning. Ninth graders have the lowest

grade point average, the most missed classes, the majority of failing grades, and more misbehavior referrals than any other grade” (p. 60).

Deemed the ‘ninth grade shock’ by Pharris-Ciuerj, Hirschman, and Willhoft (2012), the term explains the phenomenon of ninth grade students experiencing “a dramatic drop in academic performance upon entering high school” (p. 710). The underlying reasons for this change are varied and unique to each individual student, making it difficult to pinpoint effective interventions and supports that are relevant to all (Horwitz & Snipes, 2008). Several trends emerge, however, as common struggles during this transitional time in students’ lives.

Transition Struggles

In this unique period, students encounter new environments, more rigorous curriculum, new school structures and new teachers (Mizelle & Irvin, 2000). Some students may not be ready academically for the rigor of high school curriculum. Studies such as one by Lee, Grigg, and Donahue (2007), have shown that barely 30% of rising freshman can read at grade level. In a study by Akos (2004), 320 ninth-graders responded to a questionnaire asking them to list the top three things they feared most upon entering high school. The number one concern was the amount of homework and number two concern was the fear of hard homework. In another study focusing on the ninth-grade transition, the authors refer to information from a report by the National Center for Education Statistics (2014) which states that “four out of five students reported that the academic challenge was greater in ninth grade than in any other grade” (Chapman & Sawyer, 2001, p. 1).

Other students may struggle with the socio-emotional issues that the transition from a middle school to a larger high school bring. With its shifting peer groups and new and numerous teachers, students with less developed emotional intelligence or those whose fall slightly behind

those of their peers may encounter social challenges that become difficult for them to overcome. Successful transition programs must support these social transitions for students; student-teacher relationships and peer dynamics are an important aspect of how ninth-graders experience their school and handle the transition (Ellerbrock & Kiefer, 2012).

Schools need to focus on the academic preparation, support, and social influences on a student's life between grades 8 and 10 (Asko & Galassi, 2004; Clark, 2007). As indicated in the research on high school transition and school dropouts, most students who drop out of high school do so as a result of several risk factors, but most especially from a lack of academic success and the ability to become engaged in the high school experience (Barclay & Doll, 2001; Bridgeland, Dilulio & Morrison, 2006). In order to combat the problem, high schools must develop programs that will help ensure that students are academically successful and encourage engagement with the school experience. One way to target these causal factors is through the implementation of a freshman academy.

Freshman Academies

One such way to provide this support is by creating smaller learning communities that provide a safe and supportive environment to help students make a smooth transition into the high school setting. By nurturing ninth grade students and helping them to be successful, educators lay the foundation for continued academic success throughout the remainder of the students' high school career. One small learning community model gaining attention is the freshman academy model. Developed to help middle school students successfully navigate the transition to the first year of high school, improve ninth grade academic achievement, and reduce the dropout rate (Reents, 2002), the freshman academy is designed to be more supportive than a typical high school model (Cushman, 2006; Dillon, 2008).

Gary (2004) described a freshman academy model as having, “the heart of an elementary school, the teaming of a middle school, and the curriculum of a high school” (p. 56). The broad goal of freshman academies is to support ninth-grade students during their first year of high school and increase their likelihood of academic success (Fraker, 2006). This is accomplished through “provid[ing] structure, a sense of belonging, and... eas[ing] the transition into high school while integrating content and increasing communication between parents and teachers” (Clark & Hunley, 2007, p. 41).

Freshman academies are a dedicated space which can aid in making a large school feel small for ninth grade students (Thornton, 2009). This can be accomplished typically in one of two ways: an entire building for the freshman academy, or a dedicated wing or hall for the academy (Bernstein et al., 2008). Placing all freshman students together helps the larger school feel smaller and allows freshman to take the majority of their core classes with only other freshman. Other benefits are that the classrooms can be placed in a way that benefits the teaming and logical management of students, rather than just by subject taught and it can help with the transition between class periods as well, minimizing the physical distance students need to travel (Clark & Hunley, 2007).

Teams typically include the core content areas and serve a common group of students, meaning the teachers are teaching the same group of students (Bernstein et al., 2008). Sharing students can facilitate increased communication between teachers about concerns for particular students and allow teachers to specialize in working with ninth-grade students and their unique developmental stage (McIntosh & White, 2006). Academic teaming gives teachers more opportunity to communicate and exchange knowledge, develop closer relationships with students and facilitate more authentic learning (Oxley, 2005, 2001). Mansberger (2005), showed that

organizing teachers into teams was a successful strategy in school reform, so long as training and support were provided to teachers when teams were newly formed.

A final feature of many freshman academies is an intervention or seminar period within the school day for students, where students learn study and notetaking skills or gain extra supports. These interventions typically include curriculum around learning styles, study skills, test-taking strategies, organizational skills, and time management, as well as addressing social and emotional issues. For example, the freshman seminar course in the Success Academy of Talent Development high schools was designed to ensure that all freshman know about credits, high school graduation requirements and the courses they needed to take to enter a two or four-year college or university, learn study skills they would need to be academically successful, develop the social skills and life skills (e.g., goal setting, decision-making, and effective communication) they would need to be academically successful and beyond, and develop an awareness of post-secondary college and career options and investigate career clusters (Corbett & Wilson, 2000).

Some research indicates that freshman academy participants had better attendance rates, earned fewer discipline referrals, earned better grades and failed fewer courses (Fraker, 2006). Smaller learning communities, such as the freshman academy model can improve “academic achievement, academic equity, graduation rates and safety” (Lee & Friedrich, 2007). Increased feelings of safety may stem from the increased connectedness with a caring adult that the small learning community attempts to create (Kilby, 2006).

Chmelynski (2004) details a freshman academy implemented at Houston County High School in Georgia. Since the program’s implementation, discipline incidents declined by 55%. Similar results were seen at the Aldine Independent School District in Houston, Texas. There,

the ninth-grade dropout rate decreased dramatically while the number of credits earned increased (Reents, 2002).

However, there is also research that suggests that freshman academies have not affected these factors in schools. According to the United States Department of Education (2008), there is no significant trend in achievement as measured by college entrance exams related to the implementation of smaller learning communities.

Theoretical Framework

Schools are required to provide research-based activities and programs to assist with student learning and overall success. The purpose of this study was to conduct a program evaluation of the Freshman Academy transition program for program improvement. As a means to systematically provide timely evaluative information for use in decision-making, an objectives-based model was used, as this program evaluation focuses on examining the intended outcomes of the program. The objectives-based approach specifies the purpose of educational programs and determines if, or to what extent, these objectives were attained.

Tyler, a front-runner in the objectives-based model approach, viewed evaluation as the process of determining the extent to which the objectives are attained. He emphasized the use of filtering goals and objectives based on the rationale of being logical, scientifically acceptable and easily adoptable by evaluators (Tyler, 1949). Although the objective-based approach has been widely used in educational programs, it is sometimes criticized because of its simplicity and emphasis on defining outcomes.

With this program evaluation, it is the hope of the researcher to provide information regarding the efficacy of the freshman academy implementation to impact the academic achievement, school engagement, and emotional indicators measured longitudinally that will

prove useful for future decision-making. For school district leaders, it is important to be able to clearly discuss the findings and have evidence to support them. For the purpose of this study, a formative evaluation was conducted to demonstrate the ninth-grade transition program's overall impact and effectiveness.

Study Goal and Objectives

Current literature shows a lack of consensus exists as to whether the freshman academy model improves student outcomes over a more traditional, large high school model. Many studies that have been conducted are not generalizable to the local context of a suburban Midwestern high school. As such, this study investigated three research questions on the broad impact of a freshman academy model implemented in a suburban, Midwestern high school, using a quantitative causal-comparative design:

1. What is the impact of a freshman academy model on student academic achievement, as measured by ninth-grade GPA and credits earned?
2. What is the impact of a freshman academy model on student engagement, as measured by behavior referrals and attendance?
3. What is the impact of a freshman academy on emotional indicators of students' connectedness and positive future outlook, as determined by MN Student Survey?

Methods

This study utilizes a positivistic, quantitative paradigm to approach the study and analysis of data. A retrospective, causal-comparative design using existing data were utilized to analyze groups prior to, and after implementation.

Study Setting & Participants

This study included a nonrandom universe of data for all ninth-grade students who attended “Minnesota High School” (name changed for confidentiality) as ninth graders during the 2015-2016, 2016-2017, 2017-2018, 2018-2019, and 2019-2020 school years. Minnesota High School is a standard grades 9-12 secondary school which implemented a freshman academy model in the 2017-2018 school year. Freshman cohort sizes at Minnesota High School each year were: 656 students in 2015-2016, 645 students in 2016-2017, 784 students in 2017-2018, 711 students in 2018-2019, and 750 students in 2019-2020.

Instrumentation

Academic Achievement. In this study, student academic achievement and behavioral engagement was measured using data collected and accessed through Infinite Campus, the school district’s student information system. In order to quantitatively measure academic achievement, a combination of students’ grade point average (GPA) upon the end of their ninth-grade year and their percent on-track-to-graduate indicator was used. GPA was recorded based on the data from school records, found in Infinite Campus.

The second indicator of student achievement looks at students’ successful completion of credits. Students earn credits for a course by receiving a passing grade of a D- (60%) or greater. The number of credits students need in order to graduate high school did change throughout the study period, so instead of examining the number of credits student accumulated, a ratio was used in order for an equitable and clear comparison to be drawn. The on-track-to-graduate ratio was be found by using the following formula:

$$\frac{\text{Number of credits attained during ninth grade}}{\text{Number of credits required at end of ninth grade}} = \text{on-track-to-graduate ratio}$$

Behavioral Engagement. Student engagement was determined, through the literature, to include both behavioral and emotional indicators. Behavioral engagement factors measured for the study include behavior referrals and attendance information. The higher a students' attendance and the fewer a students' behavioral referrals, the more behaviorally engaged they will be. As each year the number of school days may vary, attendance was measured as a ratio of $\frac{\text{average days attended (ADA)}}{\text{average daily membership (ADM)}}$.

The number of behavior referrals was recorded in Infinite Campus during students' ninth-grade year. Behavioral engagement was formed by taking a students' attendance ratio and combining it with a modified behavior referral term: $\frac{ADA}{ADM} + (1 - \text{number of behavior referrals})$. Thus, a student with perfect attendance and no behavior referrals would have a score of 2, functioning as a maximum score for this measure. The lower a students' attendance and/or the more behavior referrals, the smaller a students' behavior composite score.

Emotional Engagement. Emotional engagement factors measured for the study include a selected number of items selected from the Minnesota Department of Educations' triennial Minnesota Student Survey. Since 1989, the Minnesota Student Survey (MSS) has been administered every three years to students across Minnesota and is the most consistent source of data about the health and well-being of Minnesota's students. All responses are anonymous. The MSS is voluntary on the part of the school districts. In 2019, over 81 percent of regular public-school districts chose to participate in the survey. In addition, parents or guardians may opt their child out of the survey, and students may choose not to participate. If students take the survey, they may skip any question or stop at any point.

Data Collection

Data were pre-existing within the School Information System, Infinite Campus, and state-administered data with the Minnesota Student Survey. Institutional Review Board approval was granted from the researchers' institution. The study utilized existing data and as such, qualified for IRB exempt status.

Academic Achievement and Behavioral Engagement. Data have been collected previously and is housed in the district's student information system, Infinite Campus. Infinite Campus has been utilized in the district since the 2013-2014 school year as a student information system (SIS). Infinite Campus is the largest American-owned SIS and is used within Minnesota High School for gradebook and transcript management, standardized assessment recording, attendance recording and reporting, behavior referrals, and demographic and contact maintenance. Data exported for the study included students' GPA at the end of 9th grade, number of credits earned, behavior referrals, attendance broken into number of excused and unexcused absences.

Data from the 2015-2016 and 2016-2017 school years was used as pre-academy implementation and data from 2018-2019 and 2019-2020 was used as two years of data post-academy implementation. Student data from the 2017-2018 school year was not used in the pre-implementation group, as active professional development and training of staff in the academy model occurred during this school year, so it is impossible to ensure teachers were not informally implementing elements of the model within their classroom instruction.

Emotional Engagement. Emotional engagement was be measured using fifteen selected items from the Minnesota Department of Education's Student Survey, administered to ninth grade students every three years. These data were collected in 2016 and 2019 and are currently

available through the Minnesota Department of Education website. The items were selected to align with specific categorical components of the emotional engagement construct, including educational engagement, connectedness with adults, connectedness with the community, connectedness with the school, future outlook and students' self-view. Survey items utilized a Likert scale of 4 or 5 points, depending on the question. Items probing the same category were grouped together in order to create a scale variable to be compared for mean group differences pre- and post-academy implementation

For each Minnesota Student Survey question, the variable was recoded, if necessary, to ensure that the lowest score represented the unfavorable response. Further, to create a meaningful zero-point and for ease of analysis, all individual item scores were adjusted by -1 to create a range of 0 to 3 or 0 to 4, depending on the questions. Individual scale scores were created by adding an individuals' item scores in the corresponding scale. Lastly, scale scores were combined to create a total composite score between zero and 47. Table 1 displays the alignment of each survey question into its respective scale.

Table 1

Construct Alignment for the Minnesota Student Survey

Scale Category	Survey Item(s)
Educational Engagement	How often do you care about doing well in school? I think the things I learn in school are useful. How often do you pay attention in class? If something interests me, I try to learn more about it.
Connectedness with Adults	Overall, adults at my school listen to me. Adults at my school listen to my students.
Connectedness with Community	How much do you feel adults in your community care about you?
Connectedness with School	Most teachers at my school are interested in me as a person. How much do you feel teachers/other adults at school care about you? At my school, teachers care about students.

Scale Category	Survey Item(s)
Future Outlook	I feel in control of my life and future. I feel good about my future. I am thinking about what my purpose is in life.
Self-View	I feel good about myself. I feel valued and appreciated by others.

Survey responses from student respondents were entered into the Statistical Package for the Social Science (SPSS) computer program. To determine mean differences in total composite scores, an independent samples t-test was used, as this measure met assumptions of normality. For comparison of scale scores, a Welch t-test was used, as parametric assumptions for these measures were not met. Means and standard deviations were presented side-by-side for comparison and analysis.

Results

Research Question 1: Academic Achievement

Pre-freshman academy, which examined the 2015-2016 and 2016-2017 school years, the academic composite scores showed a mean value of 3.85 ($SD = .03$) and a median of 4.06. The minimum academic composite score during the pre-freshman academy administration was 0.2 and the maximum score was 5.44. For students' post-freshman academy, which included the 2018-2019 and 2019-2020 school years, the mean academic score was 3.85 ($SD = .03$) and median score was 4.17. The minimum academic composite score for students' post-freshman academy was 0, with the maximum academic composite score again being 5.44.

Table 2 shows mean academic composite scores for the pre- and post-freshman academy groups, further subdivided by school year. Academic composite scores from the 2016-2017 school year and beyond show annual improvement.

Table 2*Comparison of Mean Academic Achievement Composite Scores*

Group	<i>N</i>	<i>M</i>	<i>SD</i>
Pre-Freshman Academy			
2015-2016	647	3.925	.911
2016-2017	639	3.785	1.017
Total	1290	3.850	.971
Post-Freshman Academy			
2018-2019	688	3.802	1.116
2019-2020	742	3.986	1.199
Total	1473	3.848	1.200

Note. Academic composite score was formed by adding a student's GPA with their on-track to graduate ratio (no. of credits earned/ no. of credits required). Maximum academic composite score was 5.44; minimum composite score was 0.

The non-parametric Welch t-test was conducted to determine if there were differences in academic achievement composite scores between students pre- and post- freshman academy implementation. Academic achievement scores were slightly lower in the post-freshman academy implementation ($M = 3.85$, $SD = 1.20$) than pre-freshman academy implementation group ($M = 3.85$, $SD = .97$), which was not a statistically significant difference, $MD = -.002$, 95% CI [-.084, .079], $t(2744.126) = -.059$, $p = .952$. However, within the post-freshman academy group, scores increased between the 2018-2019 school year ($M = 3.80$, $SD = 1.12$) and 2019-2020 school year ($M = 3.99$, $SD = 1.2$), a statistically significant increase, $t(1428) = 2.99$, $p =$

.003, $d = .16$. Though this is a statistically significant result, the Cohen' effect size for this academic gain ($d = .16$) is small.

Research Question 2: Behavioral Engagement

Pre-freshman academy, which examined the 2015-2016 and 2016-2017 school years, the behavioral engagement composite scores showed a mean value of 1.04 ($SD = .08$) and a median of 1.96. The minimum behavioral engagement composite score during the pre-freshman academy administration was -26.24 and the maximum score was 2. For students post-freshman academy, which included the 2018-2019 and 2019-2020 school years, the mean behavioral engagement score was 1.59 ($SD = .03$) and median score was 1.97. The minimum behavioral engagement composite score for students' post-freshman academy was -16.31, with the maximum academic composite score again being 2.

Table 3 shows mean behavioral engagement composite scores for the pre- and post-freshman academy groups, further subdivided by school year. Behavioral engagement showed annual improvement. In the 2015-2016 school year, mean behavioral engagement composite score was 1.04 ($SD = 3.03$). By the 2019-2020 school year, mean behavioral engagement composite score increased to 1.68 ($SD = .89$).

A non-parametric Welch t-test revealed behavioral engagement scores were lower in the pre-freshman academy implementation ($M = 1.03$, $SD = 3.03$) than the post-freshman academy implementation group ($M = 1.3$, $SD = 1.25$), a statistically significant result, $MD = .564$, 95% CI [.397, .732], $t(1683.433) = 6.287$, $p < .001$, $d = .24$. While behavioral engagement increased, the practical significance of this result is small.

Table 3

Comparison of Mean Behavioral Engagement Composite Scores Pre- and Post-Freshman Academy

Group	<i>N</i>	<i>M</i>	<i>SD</i>
Pre-Freshman Academy			
2015-2016	656	1.038	3.028
2016-2017	645	1.042	3.027
Total	1305	1.032	3.028
Post-Freshman Academy			
2018-2019	711	1.592	1.305
2019-2020	750	1.680	.888
Total	1506	1.596	1.246

Note. Behavioral engagement composite score was formed by:

$\frac{ADA}{ADM} + (1 - no. behavior referrals)$. Maximum behavioral engagement score was 2 and

minimum observed behavioral engagement was -26.24.

Research Question 3: Emotional Engagement

Composite Score. To determine what impact, if any, the freshman academy had on emotional engagement indicators, the researcher collected data from the Minnesota Student Survey's 2016 and 2019 administration. The researcher began analysis at the largest schema, which was comparison of the total composite score from the 2016 administration, prior to the freshman academy implementation, and the 2019 administration, post-freshman academy. In order for students to have a composite score, they had to have responded to all fifteen survey items. A list of the fifteen items examined for the composite scale score can be found in

Appendix Two. Based on this, there were 497 students with composite scores from the 2016 survey and 508 student composite scores from the 2019 survey.

The independent samples t-test was run using a 95% confidence interval. Results indicate that the mean difference between the groups in overall mean composite score for the pre-freshman academy survey administration was $M = .3148$, 95% CI [-.67792 to 1.30729] higher than the post-freshman academy survey implementation. The difference in these means was not statistically significant between the two survey administrations, $t(1003) = .622$, $p = .534$.

Scale Scores. In order to capture a more detailed and nuanced view of students' opinions, specific to individual components of the emotional engagement construct, the researcher analyzed individual component scales to determine if the freshman academy implementation had an effect on each of the categorical components of emotional engagement. Six component scales were analyzed, which were: educational engagement, connectedness with adults, connectedness with the community, connectedness with school, future outlook and positive view of self.

The number of individual responses in each scale slightly varied, as students were allowed to skip items. Table 4 provides an overview of the number of scale scores examined, the means and standard deviations between each of the two groups, the 2016 survey administration (i.e., pre-freshman academy) and the 2019 survey administration (i.e., post-freshman academy).

Table 4*School-Level Comparison of Means by Survey Administration Year for Component Scales*

Component Scale	2016 Administration (pre)			2019 Administration (post)		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Educational Engagement	552	8.60	1.957	566	8.42	1.806
Adult Connectedness	548	3.59	1.39	560	3.66	1.365
Community Connectedness	525	1.78	1.301	542	1.96	1.234
School Connectedness	518	5.71	2.292	534	5.68	2.298
Future Outlook	511	5.68	2.245	531	5.59	2.097
Self-View	514	3.52	1.762	534	3.54	1.641

Note: Educational engagement maximum score was 12 points; adult connectedness maximum score was 6 points; community connectedness maximum score was 4 points; school connectedness maximum score was 10 points; future outlook maximum score was 9 points and self-view maximum score was 6 points.

Adult connectedness, community connectedness, and self-view showed higher mean scores in the 2019 survey administration than the 2016 survey administration. Educational engagement, school connectedness, and future outlook were slightly lower in the 2019 survey administration than the 2016. A Welch t-test showed the community connectedness measure was the only one which showed statistical significance in mean difference, $t(1057.33) = -2.32$, $p = .02$, $d = .14$. Table 5 displays results of the Welch t-test for comparison of the mean component scale scores.

Table 5*Welch t-test Results for School-Level Component Scale Scores*

Component Scale	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>	95% C.I.	
					Lower	Upper
Educational Engagement	1.653	1103.839	.099	.186	-.03489	.40740
Adult Connectedness	-.818	1104.285	.414	-.068	-.23017	.09472
Community Connectedness	-2.321	1057.328	.020*	-.180	-.33265	-.02784
School Connectedness	.243	1049.183	.808	.034	-.24334	.31213
Future Outlook	.679	1028.399	.497	.091	-.17280	.35578
Self-View	-.172	1033.677	.864	-.018	-.22462	.18848

Note. Community connectedness was the only measure statistically significantly different, $p < .05$, between pre- and post-freshman academy administration, denoted by *.

Broader Level Findings. Seeking to gather a broader understanding and context of students' self-reported results on the Minnesota Student Survey administrations for the 2016 and 2019 years, the researcher was able to evaluate county data for the county in which the study high school was located, as well as state results. These findings are important, as schools are not isolated from the various regional and state-wide events and influences and results should be analyzed within the wider context in order to construct comprehensive meaning.

Composite Score. Similar to the process undertaken with the school-level data, the researcher first analyzed emotional engagement composite scores for the 2016 administration and the 2019 county and state administrations to determine if there was a significant difference in the composite scores between the survey administration years. In order for students to have a composite score, they had to have responded to all fifteen survey items.

Based on this, at the county level, there were 1,533 students from the 2016 survey and 1,577 students from the 2019 survey. The independent samples t-test was run using a 95% confidence interval. The 2016 survey administration ($M = 30.37$, $SD = 8.38$) was $MD = .99$, 95% CI [-.42 to 1.56] higher than the 2019 survey administration ($M = 29.38$, $SD = 7.85$), a statistically significant difference, $t(3108) = 3.4$, $p = .001$, $d = .12$.

Statewide, there were 41,047 student scores from the 2016 survey and 38,416 student scores from the 2019 survey. The overall emotional engagement composite score was slightly higher for the 2016 survey administration ($M = 31.2$, $SD = 7.84$) than the 2019 survey administration ($M = 29.7$, $SD = 7.73$), a mean difference of 1.56, 95% CI [1.45 to 1.67] points, $t(79461) = 28.18$, $p < .001$, $d = .20$.

Scale Scores. Again, just as the school-level data were examined, the researcher analyzed individual categorical scales at the county and state level to determine if there were significant differences in component scales between 2016 and 2019. The number of individual responses in each scale slightly varied, as students were allowed to skip items. If a student skipped an individual item that was used in a component scale score, then their data were excluded for the scale. Table 6 and 7 provides an overview of the number of student responses examined, the means, and standard deviations between each of the two groups- the 2016 survey administration and the 2019 survey administration- for the county and state levels, respectively.

Table 8 displays results of the Welch t-test for comparison of the mean component scale scores with county and state data. Results of the Welch t-test indicated that the component scale measures of educational engagement ($p < .001$, $d = .24$), future outlook ($p < .001$, $d = .13$) and self-view ($p = .009$, $d = .09$) showed statistical significance in mean difference results between the 2016 and 2019 surveys.

Table 6*Comparison of Means by Survey Administration Year for County-Level Component Scales*

Component	2016 Administration			2019 Administration		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Educational Engagement	1,639	8.83	1.919	1,711	8.39	1.794
Adult Connectedness	1,634	3.83	1.396	1,705	3.77	1.313
Community Connectedness	1,596	2.02	1.313	1,662	2.08	1.206
School Connectedness	1,585	5.95	2.361	1,649	5.90	2.194
Future Outlook	1,557	5.89	2.249	1,622	5.61	2.191
Self-View	1,571	3.72	1.709	1,629	3.57	1.666

Table 7*Comparison of State-Level Means by Survey Administration Year for Component Scores*

Component	2016 Administration			2019 Administration		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Educational Engagement	44,559	8.97	1.803	43,633	8.60	1.803
Adult Connectedness	44,332	3.98	1.301	43,883	3.76	1.317
Community Connectedness	43,371	2.12	1.27	41,550	2.08	1.231
School Connectedness	42,787	6.23	2.208	41,047	6.02	2.15
Future Outlook	43,323	6.02	2.138	40,076	5.58	2.177
Self-View	42,620	3.78	1.674	40,223	3.50	1.665

Table 8*Welch t-test Results for Component Scales between 2016 and 2019 Survey Administrations*

Component		<i>t</i>	df	<i>p</i>	<i>MD</i>	95% C.I.	
						Lower	Upper
Educational Engagement	County	6.839	3307.864	<.001*	.439	.31344	.56538
	State	30.444	88190	<.001*	.205	.370	.34589
Adult Connectedness	County	1.285	3301.325	.199	.060	-.03174	.15237
	State	24.994	88168.369	<.001*	.168	.220	.20309
Community Connectedness	County	-1.565	3205.806	.118	-.069	-.15587	.01747
	State	5.339	84906.602	<.001*	.032	.046	.029
School Connectedness	County	.642	3191.490	.521	.052	-.10577	.20888
	State	14.212	83813.664	<.001*	.095	.214	.18442
Future Outlook	County	3.504	3162.949	<.001*	.276	.12157	.43056
	State	28.947	81967.611	<.001*	.204	.435	.40593
Self-View	County	2.633	3185.635	.009*	.157	.04010	.27417
	State	24.213	82614.315	<.001*	.168	.281	.25818

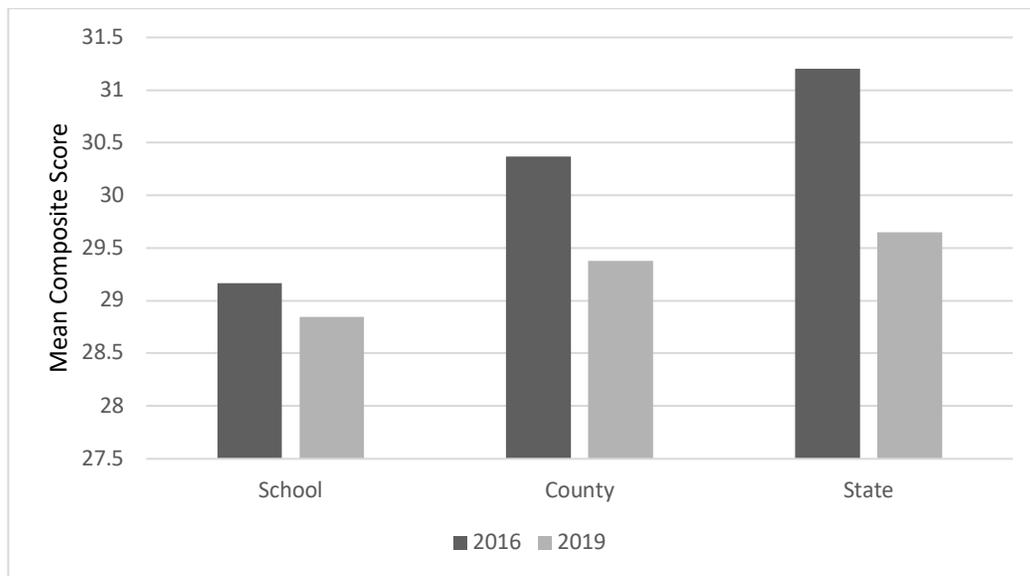
Note. Statistically significant results are denoted by * and utilize $p < .05$.

As shown in Table 8, no significant differences were found in adult connectedness, community connectedness or school connectedness scores at the county level. Educational engagement, future outlook, and self-view scores' means showed statistical significance in their differences at the county level.

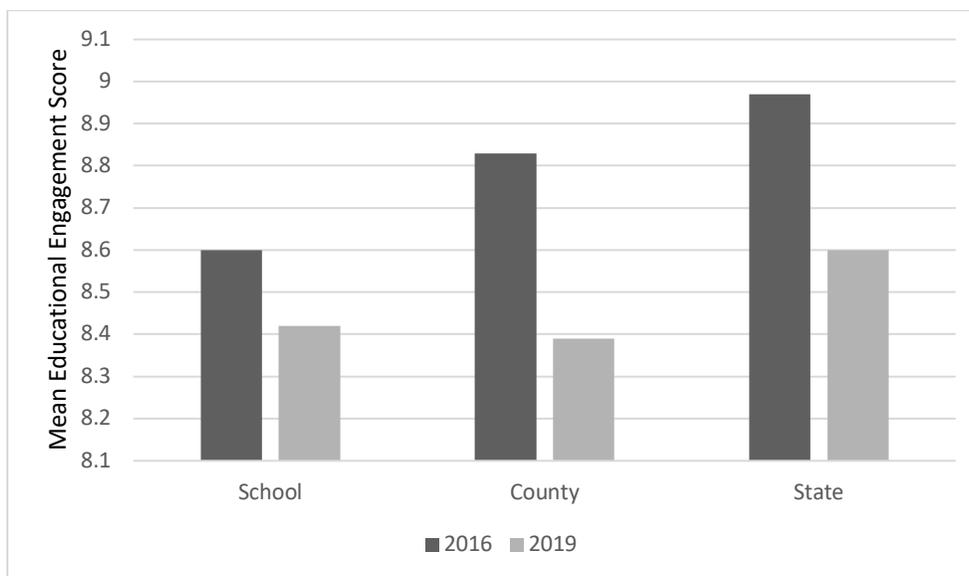
Every state component scale score was lower in the 2019 survey administration than the 2016 survey administration. Results of the Welch t-test indicated all component scale scores were significantly different ($p < .001$) in mean values between the 2016 and 2019 survey administration years; effect sizes were small for all component scores, as measured by the value of Cohen's d .

Visualizing the Results at the School, County and State Levels

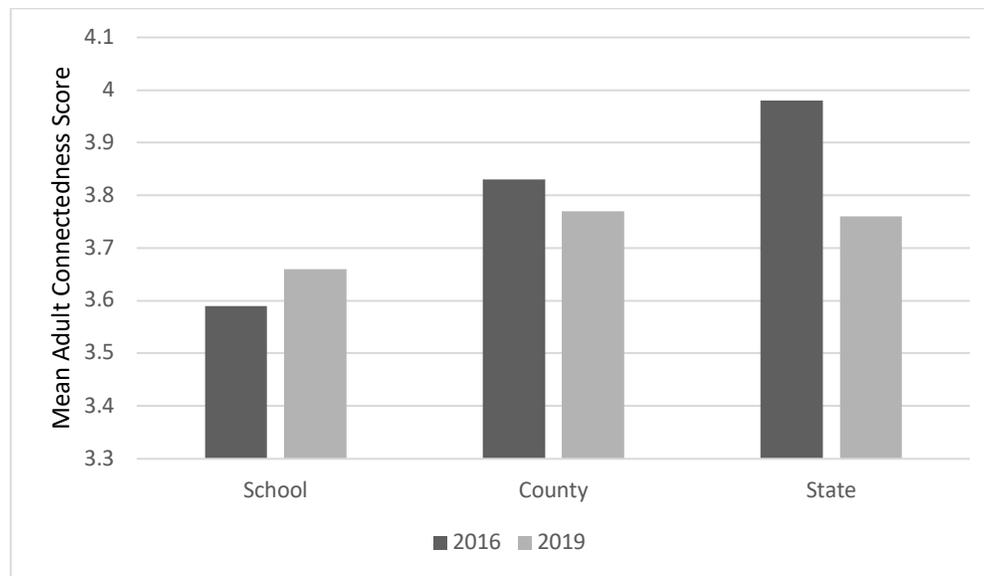
Emotional Engagement Composite Score. Comparison of emotional engagement composite scores between the 2016 and 2019 survey administration show that at all levels, the mean composite score decreased. Figure 2 presents a graphical comparison of composite scores at all levels. The 2016 school composite score was $M = .31$, 95% CI [-.68 to 1.31] higher than the 2019 composite score; a Welch t-test revealed that this decrease was not statistically significant ($p = .53$). At the county level, the 2016 composite score was $M = .99$, 95% CI [-.42 to 1.56] higher than the 2019 composite score; this was a statistically significant difference in means ($p = .001$, $d = .12$). At the state level, the 2016 composite score was $M = .99$, 95% CI [-.42 to 1.6] higher than the 2019 composite score; this was also a statistically significant difference in means ($p < .001$, $d = .20$).

Figure 1*Comparison of mean composite scores at all levels*

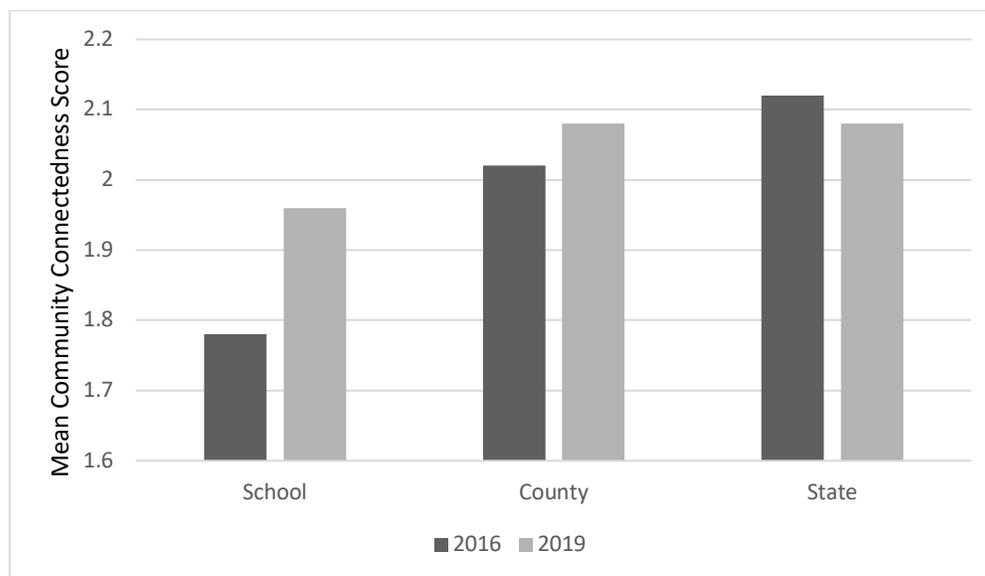
Educational Engagement. Comparison of educational engagement component scale scores between the 2016 and 2019 survey administration show that at all levels, the mean educational engagement score decreased. Specifically striking is the decrease in mean educational engagement scores for the county level. Figure 2 presents a graphical comparison of mean educational engagement scores at all levels. The 2016 school education engagement score was $M = .19$, 95% CI [-.03 to .41] higher than the 2019 score; a Welch t-test revealed that this decrease was not statistically significant ($p = .099$). At the county level, the 2016 educational engagement score was $M = .44$, 95% CI [.31 to .57] higher than the 2019 score; this was a statistically significant difference in means ($p < .001$, $d = .24$). At the state level, the 2016 educational engagement score was $M = .37$, 95% CI [.35 to .39] higher than the 2019 score; this was also a statistically significant difference in means ($p < .001$, $d = .21$).

Figure 2*Comparison of mean educational engagement scores at all levels*

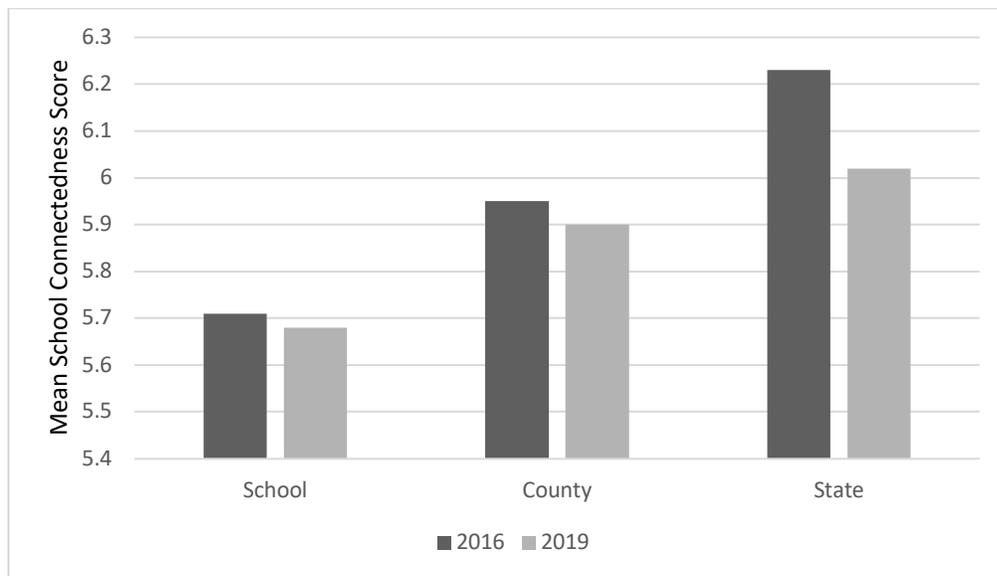
Adult Connectedness. Comparison of adult connectedness component scale scores between the 2016 and 2019 survey administration show that at the county and state level the mean educational engagement score decreased but the school saw a small increase in scale score. Figure 4 presents a graphical comparison of mean adult connectedness scores at all levels. The 2019 mean adult connectedness score was $M = .07$, 95% CI [-0.23 to .09] higher than the 2016 adult connectedness score; a Welch t-test revealed that this decrease was not statistically significant ($p = .414$). At the county level, the 2016 adult connectedness score was $M = .06$, 95% CI [-0.03 to .15] higher than the 2019 score; this not a statistically significant difference in means ($p = .199$). At the state level, the 2016 adult connectedness score was $M = .22$, 95% CI [.20 to .24] higher than the 2019 score; this was a statistically significant difference in means ($p < .001$, $d = .17$).

Figure 3*Comparison of mean adult connectedness scores at all levels*

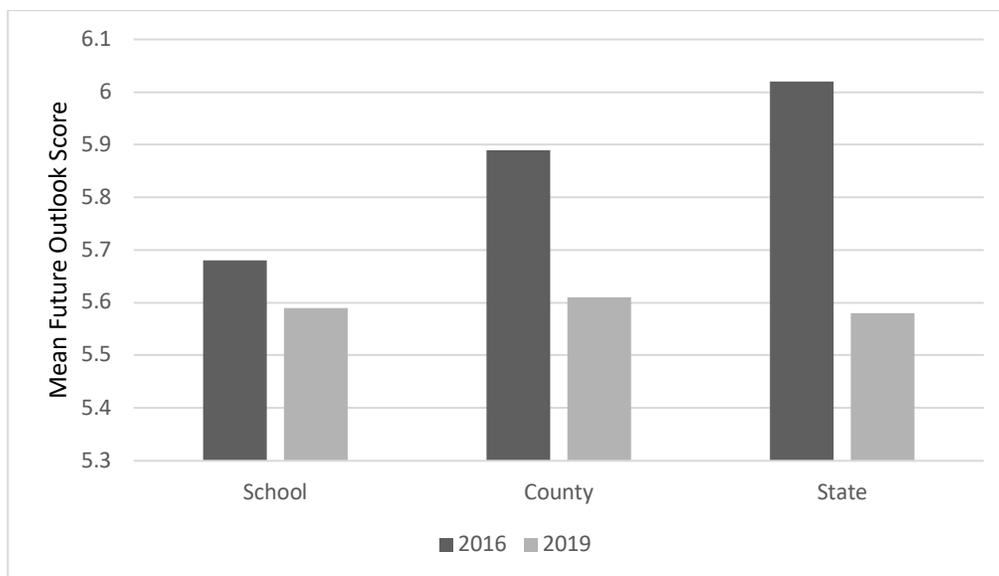
Community Connectedness. Comparison of community connectedness component scale scores between the 2016 and 2019 survey administration show that at the school and county levels there was an increase in mean score, and the state level shows a small decrease. Figure 5 presents a graphical comparison of mean community connectedness scores at all levels. The 2019 school community connectedness score was $M = .180$, 95% CI [-.33265 to -.02784] higher than the 2016 composite score; a Welch t-test revealed that this increase was statistically significant ($p = .02$). At the county level, the 2016 community connectedness score was $M = .07$, 95% CI [-.16 to .02] higher than the 2019 composite score; this not a statistically significant difference in means ($p = .12$). At the state level, the 2016 community connectedness score was $M = .05$, 95% CI [.03 to .06] higher than the 2019 community connectedness score; this was a statistically significant difference in means ($p < .001$, $d = .03$).

Figure 4*Comparison of mean community connectedness scores at all levels*

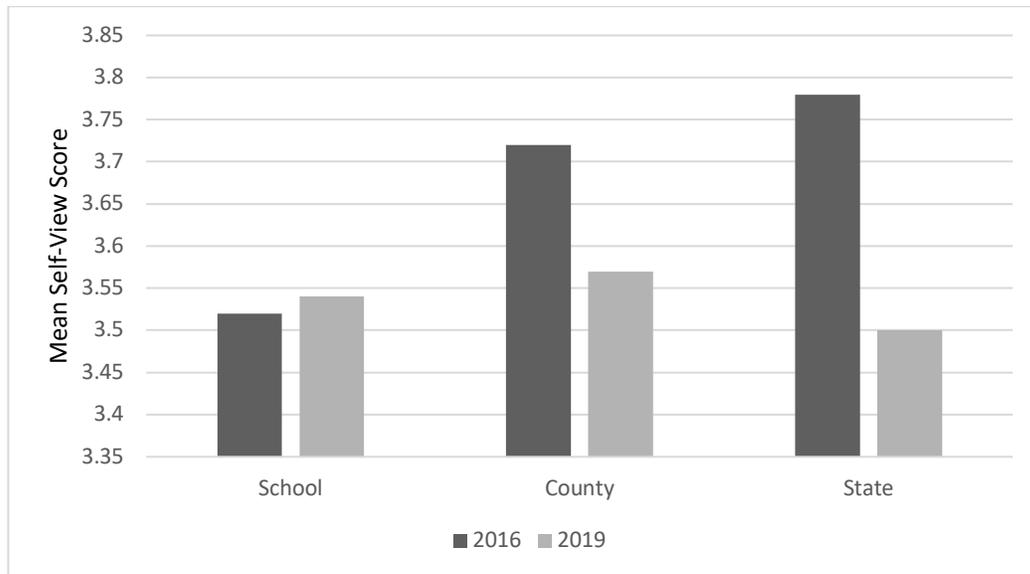
School Connectedness. Comparison of school connectedness component scale scores between the 2016 and 2019 survey administration show that at all levels a decrease in mean scale scores occurred. Figure 6 presents a graphical comparison of mean school connectedness scores at all levels. The 2016 school community connectedness score was $M = .03$, 95% CI [-0.24 to .31] higher than the 2016 composite score; a Welch t-test revealed that this decrease was not statistically significant ($p = .81$). At the county level, the 2016 school connectedness score was $M = .05$, 95% CI [-0.11 to .21] higher than the 2019 school connectedness score; this is not a statistically significant difference in means ($p = .52$). At the state level, the 2016 school connectedness score was $M = .21$, 95% CI [.18 to .24] higher than the 2019 school connectedness score; this was a statistically significant difference in means ($p < .001$, $d = .10$).

Figure 5*Comparison of mean school connectedness at all levels*

Future Outlook. Comparison of the future outlook component scale scores between the 2016 and 2019 survey administration show that at all levels a decrease in mean scale scores occurred. County and state saw larger decreases than at the school level. Figure 7 presents a graphical comparison of mean school connectedness scores at all levels. The 2016 school future outlook score was $M = .09$, 95% CI [-.17 to .35] higher than the 2016 composite score; a Welch t-test revealed that this decrease was not statistically significant ($p = .5$). At the county level, the 2016 future outlook score was $M = .28$, 95% CI [.12 to .43] higher than the 2019 composite score; this is a statistically significant difference in means ($p < .001$, $d = .13$). At the state level, the 2016 future outlook score was $M = .44$, 95% CI [.41 to .46] higher than the 2019 future outlook score; this was a statistically significant difference in means ($p < .001$, $d = .20$).

Figure 6*Comparison of mean future outlook scores at all levels*

Self-View. Comparison of the self-view component scale scores between the 2016 and 2019 survey administration show that the school level showed a relatively flat mean scale score, while the county and state saw a decrease. The state level saw a marked decrease in this measure. Figure 8 presents a graphical comparison of mean school connectedness scores at all levels. The 2019 school self-view score was $M = .02$, 95% CI [-.22 to .19] higher than the 2016 composite score; a Welch t-test revealed that this increase was not statistically significant ($p = .86$). At the county level, the 2016 self-view score was $M = .16$, 95% CI [.04 to .27] higher than the 2019 score; this is a statistically significant difference in means ($p = .009$, $d = .09$). At the state level, the 2016 self-view score was $M = .28$, 95% CI [.26 to .31] higher than the 2019 score; this was a statistically significant difference in means ($p < .001$, $d = .17$).

Figure 7*Comparison of mean self-view scores at all levels*

Discussion

Academic achievement composite scores were not statistically significantly different pre- and post-freshman academy implementation. The findings of this study did not find evidence to support that the freshman academy implementation at Minnesota High School resulted in improved academic achievement. This result was somewhat inconsistent with research indicating that freshman academies result in higher achievement (Fraker, 2006; Neild, 2009). However, within the post-freshman academy group, scores statistically significantly increased between the 2018-2019 school year and 2019-2020 school year. As this study examined the first two years of the academy model, it is reasonable to expect that the academic achievement of students will continue to increase as teachers refine their curriculum and become more effective at instruction, teaming, and interventions. Further, a block schedule was implemented at the high school studied during the 2019-2020 school year, which may also have had a positive effect on

student academic achievement. A follow-up study assessing the continual improvement of the model is necessary in order to determine whether academic achievement gains, found in the literature, will appear within the data at Minnesota High School after some longevity and stability in the model.

Behavioral engagement was measured through the creation of a composite score, which combined students' attendance rates and number of behavior referrals. A Welch t-test was used to compare the behavioral engagement scores for students pre- and post-freshman academy implementation. Behavioral engagement scores increased with freshman academy implementation, which was a statistically significant result. The literature shows the importance of attendance on students' success (Allensworth & Easton, 2007; Fredericks et al., 2004; Marks, 2000; Rice, 2016) and this finding supports the idea that a freshman academy impacts students' attendance by increasing it while decreasing behavior referrals. The latter are often the cause for students' removal from the classroom, which negatively impact on their potential for overall success.

No significant difference was found in overall emotional engagement composite score between the 2016 survey administration, which occurred prior to the freshman academy implementation and the 2019 survey administration, which occurred post-freshman academy implementation.

Educational engagement scores, measuring how engaged students are in their learning and how useful they saw their course content, also decreased slightly, a non-statistically significant result. Especially striking was comparison of school results against county-level and state-level results which saw marked and statistically significant decreases on these same survey items. This suggests that while the school-level outcome is not as desirable as one might hope,

the freshman academy may have provided some sort of insulating effect against the broader context happening around the county and state.

Adult connectedness scores remained flat at the school and county level, however at the state level scores decreased by a statistically significant amount. This again suggests that the freshman academy implementation allowed the school to maintain students' feelings of connectedness with adults in the school against the backdrop of declining adult connectedness at similar schools in the area. Research by Kilby (2006) saw similar increases in students' feelings of connection with caring adults when a small learning community was implemented. This finding is a powerful tool that the freshman academy is able to utilize, as one factor to retaining students that consistently appeared in literature was adults who communicated caring and listened to students (Bridgeland, Dilulio, & Morison, 2006; Ellerbrock & Kiefer, 2012; Knesting, 2008).

A statistically significant difference in community connectedness was observed in survey results between pre- and post-freshman academy implementation. This result was especially positive considering the significant decrease in scores at the state level. As the freshman academy implementation involved a large physical expansion of the building and partnerships with community companies, who helped develop relevant curriculum and experiences, it may be that students clearly saw the support and investment in their future that the local community has to offer them. This is a contribution of this study to the literature, which tends to focus on either the small learning community environment or the school environment, but not the larger surrounding community.

School connectedness measures remained constant at the school level, while it statistically significantly decreased at the county and state levels. Similarly, future outlook

scores were constant at the school level, but statistically significantly decreased. This result is concerning, as literature consistently supports the importance of students' feeling connected to school in order to succeed (Bridgeland et al., 2006; Finn, 1989; Heller et al., 2003). Promising, though, is that the freshman academy implemented in the high school may have prevented from more drastic decreases. While there is still progress to be made in improving this measure, it is a sign of the potentially powerful impact of a freshman academy.

Lastly, students reported a small gain in how they viewed themselves at the school level, though it was not statistically significant. Both county and state saw statistically significant decreases in self-view scores. Thus, again, while largely no change was observed for the school level, when contrasted against the broader climate of the county and state levels, the freshman academy showed promise in its ability to maintain or increase emotional engagement measures, contrasted with other schools in the county and state who were unable to do so.

Recommendations for Practice

The results of this study do not largely support the theory that freshman academies increase the academic achievement of students who participate in them. One clear area that was impacted by the implementation of a freshman academy was students' behavioral engagement, which showed large improvements for all students. As schools continue to try to support students in the freshman year transition, school interventions should be considered along with common practices for freshman academies. For example, ensuring a dedicated space for a smaller learning community, common planning time for freshman teachers, and teaming structures for teachers to support a common, shared group of students are hallmarks of freshman academy model and show effectiveness on student outcomes (Bernstein et al., 2008; Clark & Hunley, 2007). Schools should consider not only implementing these structures to support

freshman students, but also consider interventions to support the unique students and challenges of the specific school.

Many administrators, teachers, and parents view transition programs as a singular, one-day tour or orientation. However, the transition from middle to high school is not a one-time event, but rather a process that takes place over an extended period of time (Hertzog & Morgan, 1999). Successful transition programs must facilitate caring relationships, create a community of support, provide students with academic rigor and skill building, and connect between what students are learning in school to post-secondary experiences. This approach of treating the transition year as a process and addressing all dimensions of a students' experience as they transition from middle to high school is a strength of a freshman academy.

Freshman Academy Implementation. One of the most important findings from this study was the increase in students' connectedness with adults as an impact of the freshman academy implementation. It is likely that by creating a dedicated wing of the building separate from other students, students are able to form a sense of community with peers and teachers and also increases communication amongst teachers, counselors, and other support staff. Those implementing a freshman academy should physically organize their space in such a way that self-contains these students from older students for the majority of their school day and promotes connection and communication.

As an additional method of supporting students and fostering connection amongst students and the school community, school leaders should consider implementing advisories or homerooms. During these advisory or homeroom periods, teachers can lead students in discussions of academic and social issues, goal-setting, study skills, and providing student-level interventions, such as grade checks or assisting with organizational skills. This recommendation

is supported by U.S. Department of Education (2008) findings, in which researchers identified that ninth graders struggled with the development of self-regulation and self-management capacities, which contribute to the mentality that everything students do in ninth-grade counts.

Continual Improvement Monitoring. The freshman academy studied had only been implemented for two years at the time of study. Additionally, the school transitioned to a block schedule after the first year of the academy implementation. Academic achievement indicators showed statistically significant improvement between the two years of academy implementation, and a follow-up study assessing the continual improvement of the model is necessary. Measures of emotional engagement were relatively flat but seemed to avoid some of the major declines observed within the county and state. Upon administration of the 2022 Minnesota Student Survey, results should be analyzed in the same manner in order to determine if a similar trend is observed.

While the Minnesota Student Survey yields a broad idea of student perspective, focus groups and structured interviews should be considered to give voice to students and delve more into the needs of the disengaged population of students. Similarly, teacher interviews could be utilized to see if they report levels of engagement similar to students, as well as shedding light on what instructional and engagement practices are working best in their classrooms for freshman students.

Lastly, a longitudinal study following students who experienced the freshman academy to see the long-term effects the program would be beneficial. Longitudinal data on the freshman academy effect on students' academic achievement, behavioral engagement and graduation rates would be incredibly enlightening and of interest to district leaders, the community, and the growing body of literature surrounding freshman academies.

Conclusion

Though many factors are involved in the middle to high-school transition, a freshman academy implemented in one suburban, Minnesota high school showed positive impact on students' behavioral engagement and emotional engagement and suggested a positive trend in academic achievement. Other high schools will find generalization unlikely but educational leaders seeking ways to improve high school transitions and student outcomes can consider using the results of this study to weigh the potential benefit of a freshman academy.

Transforming education is an enormous undertaking but it is our responsibility as educators and educational leaders to ensure that all students experience school success. This will only be accomplished through collaborative work with students, families, educators and staff and the broader stakeholders in the community. The best learning environment for students are those that are caring, supporting, and rigorous. Students are most likely to be engaged where they feel comfortable and accepted, which a freshman academy can help to support.

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