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Predictive Ability of NWEA MAP Tests for ACT Aspire at Rivercrest High School

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PREDICTIVE ABILITY OF NWEA MAP TESTS FOR ACT ASPIRE AT RIVERCREST HIGH SCHOOL

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Abstract

NWEA claimed their assessment results could accurately predict student performance in reading and mathematics on the ACT Aspire for students in Grades 7 through 10. The purpose of this study was to determine the relationship between students' scores on the NWEA MAP tests in reading and mathematics and the ACT Aspire for students in Grades 7 through 10 in Rivercrest High School, as well as determining if NWEA MAP tests accurately predicted 7th through 10th grade students' scores on the ACT Aspire for reading and mathematics. The findings revealed a significant relationship between NWEA MAP test (seventh/eighth/ninth/tenth) grade reading and math scores and ACT Aspire scores. Further, NWEA MAP test (seventh/eighth/ninth/tenth) scores significantly predicted (seventh/eighth/ninth/tenth) grade ACT Aspire reading and mathematics scores.

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Chapter I: Introduction

Background of the Problem

It has become accepted practice in public education for standardized tests to be used to measure student performance in the areas of reading and mathematics as a measure of school accountability (Skedsmo & Huber, 2019). Results from these tests are used by state departments of education to determine proficiency levels in a formula to establish the quality of individual schools. In the state of Arkansas, schools are ranked and assigned a letter grade on a public school report card, according to the criteria outlined in the Every Student Succeeds Act (ESSA) (Arkansas Department of Education, 2017).

Student performance on the ACT Aspire, the adopted assessment test in Arkansas, in the areas of mathematics and reading are heavily weighted in the calculations for these public-school report cards (Arkansas Department of Education, 2017). Achievement and growth in these two academic areas account for 70% of the report card grade (Arkansas Department of Education, 2018). The School Quality and Student Success metric (SQSS) represents 15%, and the remaining 15% is determined by the school's graduation rate (Arkansas Department of Education, 2018).

School systems across the U.S. have allocated significant financial and human capital resources to enhance student achievement in reading and mathematics (Ladd, Muschkin, & Dodge, 2014). One particular investment is response to intervention (RTI) designed to provide point-in-time remediation to students who are struggling to perform on grade level (VanDerHeyden, Witt, & Gilbertson, 2007). The key to RTI effectiveness is timely administration in areas of identified weakness (Calero, 2015). Unfortunately,

many of these classroom assessments are not aligned to the summative, state-mandated assessments that are required at the end of the year (McDaniel, 2017). The lack of alignment to accountability assessments makes it difficult to determine how the students are progressing towards proficiency on the ACT Aspire exam (Whitaker, 2018). RTI is intended to provide regular, data-based interventions necessary to address student academic deficiencies as they arise (Buffum, 2012), but it is difficult to know if the interventions are effective until after the state-mandated summative assessment has been administered (Mellard, 2008). Since shortcomings in instructional practices and curriculum are not identified and addressed until after the ACT Aspire results have been received the adjustments are made based on data from students that will not be in the classroom to reap the benefits of the changes (Vaughn, 2016).

A periodic formative assessment would be a valuable tool for educators to quickly and accurately determine how well a student is being prepared for the ACT Aspire exam. Formative assessment tools such as NWEA MAP claim to be able to identify and diagnose student academic strengths and weaknesses. In addition, NWEA claims to be able to determine a student's progress towards proficiency on the ACT Aspire (NWEA, 2019). This claim of predictive ability by the NWEA MAP assessment has been researched and results for the students include a probability score within a predetermined range on the ACT Aspire. This study will attempt to determine an actual predicted score for the ACT Aspire based on the scores generated on the NWEA MAP assessment and then compare the actual scores with the predicted scores to find the residual scores, thereby determining how strong the predictive value of the NWEA MAP assessment is in relation to the ACT Aspire test.

Statement of the Problem

The ACT Aspire is given in the spring semester each year and the results are not available to school districts until after the end of the academic year. The ACT Aspire is not based on any particular set of state educational standards (McDaniel, 2017). There is a lot of pressure on schools because standardized testing is used to determine school quality through state report cards, determine curriculum quality, and instructional quality (Corcoran, 2017). Schools whose students fail to reach proficiency benchmarks are subject to sanctions, state department takeover, extra academic plans and potentially being placed on academic distress (Arkansas Department of Education, 2017).

The ACT Aspire is the state-mandated test that is used for calculating the state report cards. Any areas of academic weakness, holes in the curriculum, or instructional shortcomings are not identified during the school year where interventions can be implemented. There is a strong need for formative assessments that identify these achievement gaps among students before taking the summative assessment, the ACT Aspire exam. The NWEA MAP assessment claims to be that effective formative assessment (NWEA, 2019).

Purpose of the Study

The purpose of this quantitative study is to determine the relationship between the scores of Rivercrest High School students on NWEA MAP periodic assessments and those same students' performance on the ACT Aspire. A tool that accurately predicts student performance on high-stakes tests would provide educators with the data necessary to intervene and remediate/enrich students before the high-stakes state summative assessment, the ACT Aspire exam, is administered. This would allow educators to

determine if a student is on track to meet Arkansas state standards and improve the chances that individual schools and districts will score favorably on the school accountability report card.

Research Questions

This quantitative, exploratory study sought to determine the predictive ability of the NWEA MAP assessments in reading and mathematics for ACT Aspire exam scores in reading and mathematics for Rivercrest High School students in grades 7-10. The following research questions and accompanying research hypotheses based on previous research literature guided this study:

1. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

2. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

3. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

4. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

5. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

6. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 8 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

7. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

   H_1: Less than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

8. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

9. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

10. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 9 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

11. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

12. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

13. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

14. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

15. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by NWEA MAP Tests for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

16. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

Theoretical Framework

The theoretical framework for this study was based on the "theory of formative assessment," which is a blend of socio-cultural and socio-cognitive perspectives.

Accordingly, the theory of formative assessment holds that (a) thinking and learning processes are supported when students are given information and feedback regarding the learning criteria and standards by which they are assessed; and (b) when there is the subsequent use of that feedback by students and teachers as they plan the next steps of the learning process together (Black & Wiliam, 2009).

Significance of Study

The results of this study could provide results necessary to influence district policy, assessment practices, and instructional practices in Rivercrest High School. Specifically, this study may provide student-level information that school and district leaders may review to determine the effectiveness of instructional programs before administering the high-stakes ACT Aspire in the spring. Having an assessment tool that accurately predicts a student's preparedness for the ACT Aspire at several points throughout the academic year will allow educators to create a tailored instructional plan to address each student's areas of weakness before the final test is given, thereby helping to increase ACT Aspire scores, which in turn, will aid these schools in meeting the accountability requirements of the state of Arkansas.

Definition of Terms

For this study, terms were defined as follows:

- *ACT Aspire:* A test that includes a vertically scaled battery of achievement tests designed to measure student growth in a longitudinal assessment system for grades third through tenth in English, reading, writing, mathematics, and science (ACT ASPIRE, 2020a). For this study, only the reading and mathematics scores will be used.

- *ESSA* - The Every Student Succeeds Act (ESSA), is the current legislation for public education and accountability in the United States (The Understood Team, 2018).
- *Formative Assessment* – methods that teachers use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course so that adjustments can be made to facilitate student support (Great School Partnership, 2014b).
- *High-Stakes Assessment* – any test used to make important decisions about students, educators, schools, or districts, most commonly to ensure that students are enrolled in effective schools and being taught by effective teachers (Great School Partnership, 2014a)
- *NWEA MAP Test:* a computer adaptive interim assessment aligned to the ACT CCRS (NWEA, 2019).
- *SQSS* – school quality and student success metric. It is composed of several components (student engagement, reading achievement, science achievement, science value-added growth, on-time credits, high school grade-point average, Advanced Placement or concurrent credit, ACT readiness, computer science, and community service). (Arkansas Department of Education, 2018).
- *Summative Assessment* – assessments that are used to evaluate student learning, skill acquisition, and academic achievement after a defined instructional period – typically at the end of a project, unit, course, semester, program, or school year (Great School Partnership, 2013).

Assumptions

It is assumed that the NWEA MAP assessment is an instrument that produces valid and consistent results in regards to academic performance in reading and mathematics for students in Grades 7-10 in Rivercrest High School. Additionally, it is assumed that the ACT Aspire assessment produces valid and consistent results in regards to academic performance in reading and mathematics for students in Grades 7-10 in Rivercrest High School. Lastly, it is assumed that all students gave full effort on both assessments when administered.

Limitations

Due to the research design used in this study, the results of this study may not be generalizable to the entire student population in the state of Arkansas. The participants in this study were selected through a non-randomized convenience sample and the findings from this study only provide evidence of predictive ability of the NWEA MAP assessment for those participating students and cannot be generalized to any other student populations in the state of Arkansas or the U.S. as a whole.

Delimitations

The data collected in this study originated from Rivercrest students in Grades 7-10 and only those students who took both the reading and mathematics sections of the NWEA MAP test and the ACT Aspire exam in the same year were included. Only the spring administration of the NWEA MAP test was used as the predictor variable to determine the relationship between it and the ACT Aspire exam. No previous NWEA MAP scores were used. The ACT Aspire scores that were used in this study came from the assessment administered in April 2019.

Organization of the Study

Within the text of Chapter I, the background of the problem, purpose of the study, definitions of key terms, the limitations, and delimitations as well as the significance of the study. Chapter II contains the review of the literature regarding school accountability and the use of formative assessments in secondary education in the state of Arkansas. Chapter III provides a description of the research design and methods used in this study, including a description of the participants, the setting, and instrumentation. Chapter IV provides the results of the statistical analyses that were used to answer the research questions and hypotheses that guided the study. Finally, in Chapter V, a discussion of those results will be presented, along with conclusions as to what implications can be drawn from those conclusions. Recommendations for practice and future research will also be included in that chapter.

Chapter II: Review of the Literature

High-stakes testing brings with it pressure for students and teachers. This literature review focuses on an overview of school accountability in the state of Arkansas, as well as the purpose and use of formative assessments in the educational process.

The procedures used in conducting this literature review included identifying key words related to the problem statement and purpose of the study, such as high-stakes testing, accountability, and others. These key words were used in a series of Boolean descriptive searches in multiple educational databases housed in the Arkansas Tech University library. Additional information was found through Google searches to identify any pertinent organizational websites that might provide additional insight into the topic.

The literature review as presented here is a result of that detailed search and is presented in an organized manner to support the purpose and successfully implementation of this study. A further explanation of the theoretical framework introduced in Chapter I is also presented in this review.

Educational Accountability

Accountability in education is the main concept presented in this study. It is defined as an established system that holds students, teachers, administrators, individual schools, and school districts responsible for their academic performance (Madaus & Stufflebeam, 1984). Testing results are used to validate the level of success of schools, teachers, and academic programs by using student achievement data (Wiliam, 2010).

The major national educational reform initiatives over the past several decades have been presented with the goal of making schools more accountable (Hartley, 2010).

Since the publication of *A Nation at Risk: The Imperative for Educational Reform* (Guthrie & Springer, 2004), which claimed that students in the United States were falling behind students from other industrialized nations in reading, writing, and mathematics (Gardner et al, 1983), a concerted effort by policymakers and legislators at both the state and national levels have used accountability as a tool to force public schools to improve and eventually reclaim a leadership status in the world. Innovation, creation, work-force readiness, and college readiness were also listed as areas of concern (Gardner et al., 1983). In order to justify these statements, student achievement data from international students began to be collected and used to compare student success cross-culturally (Williamson, 2019).

Standardized Testing

Standardized testing is more prominent in the U.S. than in any other country (Resnick, 1982). The use of educational testing to evaluate school quality has been a common practice for a long time. In 1845, Horace Mann led the charge to adopt written exams for student evaluation because the use of the traditional oral exam format had become impractical due to increased enrollment (Tyack, 1974). In the 1890s, Joseph Rice administered thousands of spelling tests to students and found that teaching spelling for 15 minutes per day was just as effective as teaching spelling for 30 minutes per day (Cronbach, 1980). Traditionally, tests have been used to determine student placement in special programs, student college admission, and other various academic decisions about individual students (Goslin, 1963).

Standardized testing is being used to ensure that all students are learning the appropriate material in the appropriate time frame, as well as assessing the effectiveness

of the schools (Harvey & Goudvis, 2000). In Arkansas, the effectiveness of schools is communicated through the use of the Arkansas School Rating System, and a key component of that system is student scores in reading and mathematics (Arkansas Department of Education, 2016).

It is often claimed that the factor that has the greatest influence on student performance is teacher effectiveness (Jenkins, Lock, & Lock, 2018). As a result, teachers and administrators are being asked to evaluate their teaching practices to determine the level of effectiveness (Taylor, Pearson, Peterson & Rodriguez, 2003). The level of effectiveness is determined by student performance data that is obtained from periodic formative assessments (Dufour, 2006). Standardized testing opponents claim that many educators become more concerned with test results than actually ensuring that students mastered the material (Jago, 2005). While proponents claim that this level of accountability is necessary for ensuring a high-quality education for all students (Phelps, 2005).

ESSA and Assessment

The Every Student Succeeds Act (ESSA) is the current legislation for public education and accountability in the United States (The Understood Team, 2018). ESSA allowed for decisions about accountability to be made at the state level (Meredith, 2016). As a result of this new autonomy, states could select the assessments that would be used for the required testing, provided the test was nationally recognized (The Understood Team, 2018). Arkansas chose to administer the ACT Aspire (Hart, 2015)

ACT Aspire

State-mandated educational testing, formative assessment, and accountability are important to this study because the results of state testing are used to assign letter grades to schools (Arkansas Department of Education, 2018). These letter grades are based, in part, on student performance on the ACT Aspire (Arkansas Department of Education, 2018). The ACT Aspire is administered to Arkansas students in Grades 3-10 and measures growth and achievement as they progress through grade levels (ACT Aspire, 2020a). Growth and achievement represent approximately 70% of the score used to determine the letter grade assigned to schools (Arkansas Department of Education, 2018).

ACT Aspire claims that it measures student readiness for college and career (ACT Aspire, 2020b). Students who begin taking the ACT Aspire in the third grade will be tracked and progress monitored over multiple years culminating in a predicted score range for the ACT college entrance exam (ACT Aspire, 2020b). By providing performance level descriptors (PLDs) to give educators a clear explanation of student progress to improve instruction, the ACT Aspire is a formative assessment as well (ACT Aspire, 2020c).

ACT Aspire scores are used to track student growth and performance through upper elementary grades (3-6) and early high school (7-10). Table 1 shows the range of scores possible for the mathematics portion of the test and Table 2 shows the range of scores possible for the reading portion of the ACT Aspire (ACT ASPIRE, 2020).
ACT Aspire results provide educators with data for accountability (ACT ASPIRE, 2020b). This includes skill targets based on what is being taught and targets the most important college and career readiness skills (ACT ASPIRE, 2020b). The ACT Aspire

divides student performance into four descriptors for each grade level: in need of support, close, proficient, and exceeding (ACT ASPIRE, 2020c).

Table 1.

ACT Aspire Scale Scores for Mathematics.

Tested Grade	Lowest Possible Score	Highest Possible Score	Benchmark
3	400	434	413
4	400	440	416
5	400	446	418
6	400	451	420
7	400	453	425
8	400	456	422
9	400	460	428
10	400	460	432

Table 2.

ACT Aspire Scale Scores for Reading.

Tested Grade	Lowest Possible Score	Highest Possible Score	Benchmark
3	400	429	413
4	400	431	416
5	400	434	418
6	400	436	419
7	400	440	420
8	400	442	423
9	400	442	426
10	400	460	430

Additionally, ACT Aspire assessments in grade 8 are aligned with the ACT College and Career Readiness Standards (ACT ASPIRE, 2020c). The ACT readiness benchmark at each grade level is the cut score that aligns to the performance level descriptor 'proficient' (ACT ASPIRE, 2020c). Scale scores are used to report student performance (ACT Aspire, 2020d). The scale was created using multiple tests that were comprised of items from multiple grade levels (ACT ASPIRE, 2020d). The scaling tests were grouped as follows: grades three through five, grades five through seven, grades seven through ten, and the ACT (ACT ASPIRE, 2020b). This data culminates in the ACT Aspire to provide a predicted ACT score for ninth and tenth-grade students (Johnson, 2015).

NWEA MAP Test

Northwest Evaluation Association (NWEA) is a not-for-profit educational services organization located in Portland Oregon (NWEA, 2020). NWEAs assessments are called Measures of Academic Progress (MAP). MAP assessments are computerized adaptive assessments (NWEA, 2018). The difficulty of each question is based on how well the student answers the previous question (NWEA, 2018). As the student answers correctly, the difficulty of the questions increases. If the student answers incorrectly, the questions become easier (NWEA, 2018). In an ideal test administration, the student will answer approximately half of the questions correctly, and half incorrectly (NWEA). The final score is an estimate of the achievement level of the student (NWEA). MAP is administered to students at the beginning, middle, and near the end of the school year to measure the academic growth of the student and their current academic achievement (NWEA).

Every assessment item on a MAP test is anchored to a vertically aligned equal interval scale called the RIT (Rasch Unit) scale (NWEA, 2020). RIT is a stable measurement that covers all grades and is an essential data point in the student reports and learning plans (NWEA, 2020). NWEA uses concordance tables to relate scores of different assessments that measure similar constructs (NWEA, 2017).

Relationship between NWEA MAP and ACT Aspire

NWEA MAP tests claim to be able to predict performance on ACT Aspire and other ACT-generated standardized tests (NWEA, 2018). The framework for both the ACT Aspire and NWEA MAP tests are similar. The ACT Aspire and NWEA MAP tests both use data from multiple test administrations to identify areas of strength and weakness and make predictions about scores on future tests (NWEA, 2020). The ACT Aspire makes its predictive claims in regards to the ACT and NWEA makes its predictive claim in regards to the ACT Aspire. The ACT Aspire is administered once a year over several years to generate predictive data (ACT Aspire, 2020b). The NWEA is administered three times a year to generate the predictive data (NWEA, 2018). Table 3 shows the concordance of performance level score ranges between Aspire and MAP Reading tests (NWEA, 2018). Table 4 shows the concordance of performance level score ranges between Aspire and MAP Math tests (NWEA, 2018).

Table 3.

Concordance of Performance Level Score Ranges between Aspire and NWEA MAP for Reading

	ASPIRE			
Grade	Level 1 *In need of Support*	Level 2 *Close*	Level 3 *Ready*	Level 4 *Exceeding*

3	400-410	411-414	415-418	419-442
4	400-411	412-416	417-421	422-442
5	400-414	415-419	420-424	425-442
6	400-415	416-420	421-425	426-442
7	400-416	417-422	423-428	429-442
8	400-417	418-423	424-429	430-442

MAP

Grade	Level 1 *In need of Support*		Level 2 *Close*		Level 3 *Ready*		Level 4 *Exceeding*	
	RIT	%tile	RIT	%tile	RIT	%tile	RIT	%tile
3	100-197	1-47	198-206	48-69	207-218	70-90	219-350	91-99
4	100-200	1-35	201-212	36-67	213-224	68-89	225-350	90-99
5	100-207	1-38	208-220	15-62	221-231	73-90	232-350	91-99
6	100-209	1-33	210-221	34-65	222-231	66-85	232-350	86-99
7	100-223	1-38	400	39-69	227-244	71-95	245-350	96-99
8	100-228	1-44	400	45-70	228-245	69-94	246-350	95-99

Table 4.

Concordance of Performance Level Score Ranges between Aspire and NWEA MAP for Math

ASPIRE

Grade	Level 1 *In need of Support*	Level 2 *Close*	Level 3 *Ready*	Level 4 *Exceeding*
3	400-408	409-412	413-416	417-460
4	400-410	411-415	416-420	421-460
5	400-411	412-417	418-423	424-460

6	400-413	414-419	420-425	426-460
7	400-415	416-421	422-427	428-460
8	400-418	419-424	425-430	431-460

MAP

Grade	Level 1 *In need of Support*		Level 2 *Close*		Level 3 *Ready*		Level 4 *Exceeding*	
	RIT	%tile	RIT	%tile	RIT	%tile	RIT	%tile
3	100-197	1-47	198-206	48-69	207-218	70-90	219-350	91-99
4	100-200	1-35	201-212	36-67	213-224	68-89	225-350	90-99
5	100-207	1-38	208-220	15-62	221-231	73-90	232-350	91-99
6	100-209	1-33	210-221	34-65	222-231	66-85	232-350	86-99
7	100-223	1-38	400	39-69	227-244	71-95	245-350	96-99
8	100-228	1-44	400	45-70	228-245	69-94	246-350	95-99

Application of Data

Schools use the student performance data generated by testing results to validate curriculum programs, instructional practices, professional development practices, human capital decisions, and more (Wiliam, 2010).

Classroom assessments, including formative and other kinds that are not state-mandated, represent nearly $1.6 billion in spending from educational institutions in the United States, compared with the almost $1.3 billion that will be spent for state-mandated tests (Molnar, 2017). The main reason for the increase in spending is so that schools can use the assessments to acquire data that will allow them to diagnose academic strengths and weaknesses in students early in the academic year (Molnar, 2017). Early identification of students' academic shortcomings will allow for interventions to be

prescribed early enough in the academic year to close achievement gaps before the state-mandated test is administered (Bedwell, 2004).

Early diagnosis of academic issues is essential for timely intervention (Fox, 2008). Using technology to administer assessments, collect data, analyze data, and present data will aid schools in making data-driven decisions (NWEA, 2018).

Theoretical Perspective

The review of the literature revealed accountability as the theoretical perspective for this study. Madaus and Stufflebeam (1984) state that accountability through assessment, analysis of results, and timely feedback serves as a quality control mechanism in the educational process.

The theory of formative assessment is broad. The study of diverse classroom practices that are formative to the extent that the information about student performance is elicited, interpreted, and used by stakeholders to make decisions about the next steps in instruction. These decisions will be better informed and would be more likely to have a greater influence on student performance than decisions that would have been made in the absence of evidence (Black & Wiliam, 2009). The theory of formative assessment offers insight into the relationship between other pedagogic initiatives such as cognitive acceleration and dynamic assessment (Black & Wiliam, 2009). The theory of formative assessment focuses on three learning and teaching processes (Black & Wiliam, 2009):

- Establishing where the students are in their learning.
- Establishing where we would like them to be.
- Establishing what needs to be done to get them there.

Formative assessment can be conceptualized using five strategies that when crossed with the three processes mentioned earlier provide a framework for maximum educational impact (Black & Wiliam, 2009):

- Clarifying and sharing learning intentions and criteria for success
- Engineering classroom discussions and other learning tasks that elicit evidence of student understanding
- Providing feedback that moves learners forward
- Use of students as instructional resources for one another
- Activating students as the owners of their learning

Many activities are considered formative assessments. It is considered formative if the activity can be used as a means of enacting one of the five key strategies. For example, classroom questioning can be used to enact a classroom discussion to elicit student understanding (Black & Wiliam, 2009).

The three key processes and three of the five key strategies are especially helpful for informing the research question for this study. The first key process, establishing where the students are in their learning, deals with the need to accurately know what student skills need to be remediated and what student skills need to be enriched (Black & Wiliam, 2009). The second key process, establishing where they are going, sets the goal for the student. For this study, the goal is proficiency in mathematics and reading on the ACT Aspire summative assessment. The third key process, establishing what needs to be done to get them there, provides the framework for academic interventions and alteration of instruction to meet individual student needs (Black & Wiliam, 2009).

Three of the five key strategies from the theory of formative assessment will be used to inform this study. First, clarifying and sharing learning intentions and criteria for success. This strategy is implemented when the testing cycle begins. Students and teachers work together to set incremental goals that are monitored throughout the year. Secondly, providing feedback that moves students forward. This strategy informs the study by providing data on student performance that allows students and teachers to understand where the skill deficits exist. The reports provide actionable feedback suggestions for the students and teachers. Lastly, activating students as agents of their learning. By setting small attainable goals that will eventually lead to the larger goal of proficiency on the state exam, students take ownership of their learning and become more active in the learning process. For the formative assessment to have value, it needs to prepare students for the state-mandated summative test. This study will determine if NWEA MAP tests provide the information necessary for Rivercrest high school students to reach the goal of proficiency.

Summary

The literature review contained information for the accountability system in the state of Arkansas and the use of formative assessments to inform and guide instruction to better educate students. The ACT Aspire is a summative assessment in reading, mathematics, science, and English (ACT Aspire, 2020b). The test measures student achievement and growth starting in the third grade and ending in the tenth grade (ACT Aspire, 2020b). NWEA MAP tests declare that the results on their formative assessment can accurately predict student performance levels on the ACT Aspire (NWEA, 2018). The researcher will utilize the literature review to examine the relationship between the

two assessments. This relationship will be used to formulate the hypotheses used for the study.

Chapter III: Methodology

This chapter outlines the methodology used in this study. The purpose of this study was to examine the relationship between math and reading scores for students in Grades 7-10 at Rivercrest High School on NWEA MAP Tests and ACT Aspire. In this chapter, the research design, participants, data collection methods, instruments, and data analysis are presented.

Participants

NWEA MAP formative assessments are administered to all students in Grades 7 through 10 three times per year, in the fall (September), winter (December), and spring (March). The population identified for this study consisted of Rivercrest students who took the NWEA MAP formative assessment during the 2018-2019 academic year and the ACT Aspire in the spring semester of 2019. Any student who did not have a generated predicted achievement range and a valid ACT Aspire score for the 2018-2019 academic year was excluded from the study.

Sampling/Census

The participants for this study included the entire population as described above**.** Therefore, rather than a sample of students, the study will utilize a census of all students identified as part of this population. All students who are enrolled at Rivercrest High School in Grades 7 through 10, took NWEA MAP tests throughout the year and generated a score range prediction for the ACT Aspire, and took the ACT Aspire during the spring administration made up the participants for the study. The number of participants was approximately 355 students.

Existing NWEA MAP and ACT Aspire data for all students who met the selection criteria for this study was compiled by the district testing coordinator and all identifying information was deleted to maintain the anonymity of the participants. Permission to use these archived data was obtained from the Rivercrest superintendent. The permission letter is included in Appendix B. The data collected consisted of NWEA MAP scores in reading and math, as well as ACT Aspire scores for tests taken in reading and math. The researcher requested that all sets of data (NWEA MAP Test scores, predicted ACT Aspire range, and ACT Aspire scores) be delivered in a google sheet. The data were then uploaded into SPSS26 for statistical analysis.

Research Design

This study was a quantitative descriptive non-experimental study that was intended to examine the relationship between student scores on NWEA MAP Test formative assessments and their predicted performance level and their actual performance level as verified by scores on the ACT Aspire for students in Grades 7-10 in Rivercrest High School. The non-experimental nature of this study allowed for the evaluation of variables within the study without controlling the conditions (Radhakrishnan, 2013). This study was exploratory in nature. The results were informational for the Rivercrest High School administration but is not generalizable to other schools or districts.

Once the data were collected and entered into SPSS26, a series of statistical analyses was run to determine the relationship between the scores on NWEA MAP tests (formative) and ACT Aspire tests (summative) in the subject areas of reading and math. Pearson Product-Moment correlation analysis was used to determine the strength of the relationship and simple linear regression was used to determine the predictive value of

these two variables, using the NWEA MAP test scores as the predictive variable or independent variable and the ACT Aspire test scores as the outcome variable of dependent variable. Statistical significance was established at an alpha level of $p < .05$ to reject or fail to reject the hypotheses.

Research Questions and Hypotheses

The study was guided by a series of research questions and accompanying research hypotheses to determine if there was a predictive relationship between the NWEA MAP test scores and the ACT Aspire test scores for both reading and math at each grade level. In addition, research questions were set to determine the frequency of students who fell within the predicted range for the ACT Aspire established by the NWEA MAP test results. Table 5 provides a breakdown for

1. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

2. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

3. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

4. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

5. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

6. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 8 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

7. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

   H_1: Less than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

8. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

9. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

10. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 9 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

11. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

12. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

13. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

14. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

15. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by NWEA MAP Tests for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

16. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

Measurement/Statistical Analysis

The table below shows the variables and statistical analyses for the research questions and hypotheses in the study.

Table 5.

Variables and Planned Statistical Analyses.

Research Question	Variables	Statistical Test
Do NWEA MAP reading and math test scores predict ACT Aspire reading and math scores for students in grades 7-10 in Rivercrest High School?	V1- NWEA MAP reading test scores. V2- ACT Aspire reading scores	Linear Regression
How often do student scores on the math and reading portions of ACT Aspire fall in the predicted performance range predicted by NWEA MAP Tests for students in grades 7-10 in Rivercrest High School?	IV- NWEA MAP predicted score ranges for ACT Aspire math and reading tests for grades 7-10. DV- ACT Aspire math and reading test scores from spring 2019 for grades 7-10.	Frequency/ percentage

Context of the Study

Rivercrest High School (RHS) is a rural school located in southern Mississippi County in the delta region of northeast Arkansas. Rivercrest is a consolidated school district that covers 371 square miles and encompasses the surrounding towns and communities of Wilson, Dyess, Joiner, Luxora, Marie, Bassett, and Keiser. The combined population of these communities is 3,789 (United States Census Bureau, 2019). Rivercrest High School (RSD) has an elementary school (Rivercrest Elementary, K-6) and a high school (Rivercrest High School, grades 7-12). There are 570 students attending RHS. The participants of this study included 367 students in Grades 7-10 (ADE Data Center, 2019).

Research Ethics

Data were collected, analyzed, and reported in a manner that did not require identifiable information about students. Individual student data was combined and presented as a cohort. Presentation of combined data will allow for any identifiable data relating to the student to be protected.

Because the data collected for this study was archival and used with permission of the participating school district administration, the Arkansas Tech University Institutional Review Board (IRB) granted permission as an exempt study. The approval letter from the IRB is included as Appendix A.

Chapter IV: Results

The purpose of this study was to determine the relationship between students' scores on the NWEA MAP tests for reading and mathematics and the ACT Aspire scores for reading and math for students in Rivercrest High School, as well as determining how often the NWEA MAP test correctly predicted the ACT Aspire performance range for those students.

Research Questions

The researcher used the following questions to guide this study:

1. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

2. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

3. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

4. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

5. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

6. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 8 in Rivercrest High School?

H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

7. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

   H_1: Less than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

8. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

   H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

9. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

10. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 9 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

11. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

12. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

13. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

14. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

15. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by NWEA MAP Tests for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

16. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

The following section outlines the analysis of data and findings for each research question in this study. First, the relationship between NWEA MAP Test scores for math and reading at each grade level for Grades 7-10 and ACT Aspire scores in reading and math at each grade level for Grades 7-10 were examined using simple linear regression and the regression model $\hat{Y} = B_o + B_1X_1 + \hat{e}$, where $\hat{Y}$ is the predicted value for the

dependent variable (ACT Aspire score), B_o is the constant, B1 is the Next, the results of the seventh, eighth, ninth, and tenth grade NWEA MAP scores were presented followed by the results of the seventh, eighth, ninth, and tenth grade ACT ASPIRE. Finally, an analysis of the accuracy and frequency of the ACT Aspire predictor scores for each grade level and subject based on subject and grade level NWEA MAP Test scores were presented.

Research Question 1

The first research question was: Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for mathematics that is taken in Grade 7 could accurately predict the ACT Aspire scores on the mathematics section of the test for Grade 7 students. The information in the literature review claimed that NWEA MAP tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

Table 6.

Regression Analysis Summary for NWEA Grade 7 Math Scores Predicting ACT Aspire Grade 7 Math Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	353.78	5.16	343.54 - 364.02		68.62	.000
NWEA Grade 7 Math Scores	.302	.024	.25 - .35	.79	12.50	.000

Note. R^2adjusted = 0.620. CI = confidence interval for B. SE = standard error of the estimate.

A simple linear regression was calculated predicting NWEA Grade 7 Math Scores on the ACT Aspire Grade 7 Math Scores. Table 7 shows the ANOVA results for this

regression analysis indicating that there was a statistically significant relationship between the two variables ($F_{(1,94)} = 156.32$, $p < .001$). As reported in Table 6, $R^2 = 0.62$, meaning that 62% of the variance in the ACT Aspire Grade 7 math score can be explained by the predictor variable, NWEA Grade 7 math Scores. Using the regression model, the predicted score for ACT Aspire Grade 7 math equals 353.78 + (0.302 times the NWEA Grade 7 math scores).

Based upon these results the null hypothesis is rejected.

Table 7.

ANOVA for NWEA Grade 7 Math Scores Predicting ACT Aspire Grade 7 Math Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	2134.77	1	2134.77	156.32	.000
	Residual	1283.72	94	13.66		
	Total	3418.49	95			

Research Question 2

The second research question was: Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 7 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for reading that is taken in the Grade 7 could accurately predict the ACT Aspire scores on the reading section of the test for Grade 7 students. The information in the literature review claimed that NWEA MAP test could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

A simple linear regression using the established regression model, was calculated predicting NWEA Grade 7 reading scores on the ACT Aspire Grade 7 reading scores.

Table 9 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship between the two variables ($F_{(1,96)} = 134.21$, $p < .001$). As reported in Table 8, $R^2 = 0.579$ meaning that 57.9% of the variance in the ACT Aspire Grade 7 reading score can be explained by the predictor variable, NWEA Grade 7 reading scores. Using this regression model, the predicted score for ACT Aspire Grade 7 reading scores ($\hat{Y}$) equals 354.95 + (0.305 times the NWEA Grade 7 reading scores).

Based upon these results the null hypothesis is rejected.

Table 8.

Regression Analysis Summary for NWEA Grade 7 Reading Scores Predicting ACT Aspire Grade 7 Reading Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	354.95	5.46	344.12 - 365.78		65.05	.000
NWEA Grade 7 Reading Scores	.305	.026	.25 - .36	.76	11.86	.000

Note. R^2adjusted = 0.579. CI = confidence interval for B. SE = standard error of the estimate.

Table 9.

ANOVA for NWEA Grade 7 Reading Scores Predicting ACT Aspire Grade 7 Reading Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	2436.83	1	2436.83	134.21	.000
	Residual	1743.00	96	18.16		
	Total	4179.84	97			

Research Question 3

The third research question was: How often do Grade 7 students' ACT Aspire scores for mathematics fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the number of times Grade 7 students' mathematics scores fell within the predicted range provided by the NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was predicting ACT Aspire scores.

Table 10.

NWEA MAP Predictive Frequency and Percentage for Grade 7 Math.

N	# of times ACT Aspire math scores fell within the predicted NWEA range	Percentage of ACT Aspire math scores that fell within predicted NWEA MAP range
96	65	67.7%

Table 10 shows the Grade 7 math test data including the number of participants, number of times the ACT Aspire mathematics scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 7 ($N = 96$) participants had 65 scores (67.7% of the students) fall within the predicted NWEA MAP range for math.

These results fail to reject the null hypothesis.

Research Question 4

The fourth research question was: How often do Grade 7 students' ACT Aspire scores for reading fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the number of times Grade 7 students' reading scores fell within the predicted range provided by NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was predicting ACT Aspire scores.

Table 11.

NWEA MAP Predictive Frequency and Percentage for Grade 7 Reading.

N	# of times ACT Aspire reading scores fell within predicted NWEA range	Percentage of times ACT Aspire reading scores fell within predicted NWEA MAP range
98	63	64.3%

Table 11 contains the Grade 7 reading test data including the number of participants, number of times the ACT Aspire reading scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The

Grade 7 ($N = 98$) participants had 63 scores (64.3% of the students) fall within the predicted NWEA MAP range.

These results fail to reject the null hypothesis.

Research Question 5

The fifth research question was: Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for mathematics that is taken in the Grade 8 could accurately predict the ACT Aspire scores on the mathematics section of the test for Grade 8 students. The information in the literature review claimed that NWEA MAP Tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

Table 12.

Regression Analysis Summary for NWEA Grade 8 Math Scores Predicting ACT Aspire Grade 8 Math Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	346.22	5.72	334.86 - 357.58		60.61	.000
NWEA Grade 8 Math Scores	.34	.03	.29 - .39	.82	13.00	.000

Note. R^2adjusted = 0.661. CI = confidence interval for B. SE = standard error.

A simple linear regression was calculated predicting NWEA Grade 8 math scores on the ACT Aspire Grade 8 math scores. Table 13 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship

between the two variables ($F_{(1,85)} = 168.96$, $p < .001$). As reported in Table 12, $R^2 = 0.661$ meaning that 66.1% of the variance in the ACT Aspire Grade 8 math score can be explained by the predictor variable, NWEA Grade 8 math Scores. Using this regression model, the predicted score for ACT Aspire Grade 8 math scores ($\hat{Y}$) equals 346.22 + (0.34 times the NWEA Grade 8 math scores).

Based upon these results the null hypothesis is rejected.

Table 13.

ANOVA for NWEA Grade 8 Math Scores Predicting ACT Aspire Grade 8 Math Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig
1	Regression	2708.40	1	2708.40	168.96	.000
	Residual	1362.52	85	16.03		
	Total	4070.92	86			

Research Question 6

The sixth research question was: Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 8 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for reading that is taken in Grade 8 could accurately predict the ACT Aspire scores on the reading section of the test for Grade 8 students. The information in the literature review claimed that NWEA MAP Tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

A simple linear regression was calculated predicting NWEA Grade 8 reading scores on the ACT Aspire Grade 8 reading scores. Table 15 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship

between the two variables ($F_{(1,84)} = 90.42$, $p < .001$). As reported in Table 14, $R^2 = 0.513$ meaning that 51.3% of the variance in the ACT Aspire Grade 8 Reading score can be explained by the predictor variable, NWEA Grade 8 reading scores. Using this regression model, the predicted score for ACT Aspire Grade 8 reading scores (Ŷ) equals 345.68 + (0.35 times the NWEA Grade 8 reading scores).

Based upon these results the null hypothesis is rejected.

Table 14.

Regression Analysis Summary for NWEA Grade 8 Reading Scores Predicting ACT Aspire Grade 8 Reading Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	345.68	7.95	329.86 - 361.50		43.46	.000
NWEA Grade 8 Reading Scores	.35	.04	.28 - .43	.72	9.51	.000

Note. R^2adjusted = 0.513. CI = confidence interval for B. SE = standard error.

Table 15.

ANOVA for NWEA Grade 8 Reading Scores Predicting ACT Aspire Grade 8 Reading Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	2069.97	1	2069.70	90.42	.000
	Residual	1923.07	84	22.89		
	Total	3993.04	85			

Research Question 7

The seventh research question was: How often do Grade 8 students' ACT Aspire scores for mathematics fall in the predicted range given by NWEA MAP? The researcher

used a hand-count method to calculate the frequency and percentage for the number of times Grade 8 students' mathematics scores fell within the predicted range provided by the NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was predicting ACT Aspire scores.

Table 16

NWEA MAP Predictive Frequency and Percentage for Grade 8 Math.

N	# of times ACT Aspire math scores fell within predicted NWEA range	Percentage of times ACT Aspire math scores landed within predicted NWEA MAP range
87	51	58.6%

Table 16 contains the Grade 8 mathematics test data including the number of participants, number of times the ACT Aspire mathematics scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 8 ($N = 87$) participants had 51 scores (58.6% of the students) fall within the predicted NWEA MAP range.

These results fail to reject the null hypothesis.

Research Question 8

The eighth research question was: How often do Grade 8 students' ACT Aspire scores for reading fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the number of times Grade 8 students' reading scores fell within the predicted range provided by NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was predicting ACT Aspire scores.

Table 17

NWEA MAP Predictive Frequency and Percentage for Grade 8 Reading.

N	# of times ACT Aspire reading scores fell within predicted NWEA range	Percentage of times ACT Aspire reading scores fell within predicted NWEA MAP range
86	37	43.0%

Table 17 contains the Grade 8 reading test data including the number of participants, number of times the ACT Aspire reading scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 8 ($N = 86$) participants had 37 scores (43.0% of the students) fall within the predicted NWEA MAP range.

These results fail to reject the null hypothesis.

Research Question 9

The ninth research question was: Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for mathematics that is taken in the Grade 9 could accurately predict the ACT Aspire scores on the mathematics section of the test for Grade 9 students. The information in the literature review claimed that NWEA MAP Tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

Table 18.

Regression Analysis Summary for NWEA Grade 9 Math Scores Predicting ACT Aspire Grade 9 Math Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	355.33	7.32	329.86 - 361.50		48.54	.000
NWEA Grade 9 Math Scores	.29	.03	.28 - .43	.672	9.09	.000

Note. R^2adjusted = 0.445. CI = confidence interval for B. SE = standard error.

Table 19.

ANOVA for NWEA Grade 9 Math Scores Predicting ACT Aspire Grade 9 Math Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	2022.78	1	2022.78	82.69	.000
	Residual	2470.66	101	24.46		
	Total	4993.44	102			

A simple linear regression was calculated predicting NWEA Grade 9 Math Scores on the ACT Aspire Grade 9 Math Scores. Table 19 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship between the two variables ($F_{(1,101)} = 82.69$, $p < .001$). As reported in Table 18, $R^2 =$ 0.445 meaning that 44.5% of the variance in the ACT Aspire Grade 9 math score can be explained by the predictor variable, NWEA Grade 9 math scores. Using this regression model, the predicted score for ACT Aspire Grade 9 math scores ($\hat{Y}$) equals 355.33 + (0.29 times the NWEA Grade 9 math scores).

Based upon these results the null hypothesis is rejected.

Research Question 10

The tenth research question was: Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 9 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for reading that is taken in the Grade 9 could accurately predict the ACT Aspire scores on the reading section of the test for Grade 9 students. The information in the literature review claimed that NWEA MAP Tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

A simple linear regression was calculated predicting NWEA Grade 9 reading scores on the ACT Aspire Grade 9 reading scores. Table 21 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship between the two variables ($F_{(1,91)} = 68.23$, $p < .001$). As reported in Table 20, $R^2 = 0.422$ meaning that 42.2% of the variance in the ACT Aspire Grade 9 reading score can be explained by the predictor variable, NWEA Grade 9 reading scores. Using this regression

model, the predicted score for ACT Aspire Grade 9 reading scores ($\hat{Y}$) equals 341.82 + (0.36 times the NWEA Grade 9 reading scores).

Based upon these results the null hypothesis is rejected.

Table 20.

Regression Analysis Summary for NWEA Grade 9 Reading Scores Predicting ACT Aspire Grade 9 Reading Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	341.82	9.50	322.94 - 360.69		35.97	.000
NWEA Grade 9 Reading Scores	.36	.04	.27 - .45	.66	8.26	.000

Note. R^2adjusted = 0.422. CI = confidence interval for B. SE = standard error.

Table 21.

ANOVA for NWEA Grade 9 Reading Scores Predicting ACT Aspire Grade 9 Reading Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	2138.80	1	2138.80	68.23	.000
	Residual	2852.45	91	31.35		
	Total	4991.25	92			

Research Question 11

The eleventh research question was: How often do Grade 9 students' ACT Aspire scores for mathematics fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the number of times Grade 9 students' mathematics scores fell within the predicted range provided by

the NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was predicting ACT Aspire scores.

Table 22 contains the Grade 9 mathematics test data including the number of participants, number of times the ACT Aspire mathematics scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 9 (N = 103) participants had 58 scores (56.3% of the students) fall within the predicted NWEA MAP range.

These results fail to reject the null hypothesis.

Table 22.

NWEA MAP Predictive Frequency and Percentage for Grade 9 Math.

N	# of times ACT Aspire math scores fell within predicted NWEA range	Percentage of times ACT Aspire math scores fell within predicted NWEA MAP range
103	58	56.3%

Research Question 12

The twelfth research question was: How often do Grade 9 students' ACT Aspire scores for reading fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the number of

times Grade 9 students' reading scores fell within the predicted range provided by NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was doing what it was supposed to be doing (predicting ACT Aspire scores).

These results fail to reject the null hypothesis.

Table 23.

NWEA MAP Predictive Frequency and Percentage for Grade 9 Reading.

N	# of times ACT Aspire reading scores fell within predicted NWEA range	Percentage of times ACT Aspire reading scores landed within predicted NWEA MAP range
93	57	61.3%

Table 23 contains the Grade 9 reading test data including the number of participants, number of times the ACT Aspire reading scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 9 ($N = 93$) participants had 57 scores (61.3% of the students) fall within the predicted NWEA MAP range.

Research Question 13

The thirteenth research question was: Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for mathematics that is taken in the Grade 10 could accurately predict the ACT Aspire scores on the mathematics section of the test for Grade 10 students. The information in the literature review claimed that NWEA MAP Tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

Table 24.

Regression Analysis Summary for NWEA Grade 10 Math Scores Predicting ACT Aspire Grade 10 Math Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	349.07	9.65	329.79 - 368.35		36.12	.000
NWEA Grade 10 Math Scores	.32	.04	.24 - .41	.68	7.53	.000

Note. R^2adjusted = 0.458. CI = confidence interval for B. SE = standard error.

Table 25.

ANOVA for NWEA Grade 10 Math Scores Predicting ACT Aspire Grade 10 Math Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	1479.30	1	1479.30	56.77	.000
	Residual	1693.80	65	26.06		
	Total	3173.10	66			

A simple linear regression was calculated predicting NWEA Grade 10 math scores on the ACT Aspire Grade 10 math scores. Table 25 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship between the two variables ($F_{(1,65)} = 56.77$, $p < .001$). As reported in Table 24, $R^2 = 0.458$ meaning that 45.8% of the variance in the ACT Aspire Grade 10 math scores can be explained by the predictor variable, NWEA Grade 10 math scores. Using this regression model, the predicted score for ACT Aspire Grade 10 math scores ($\hat{Y}$) equals 349.07 + (0.32 times the NWEA Grade 10 math scores).

Based upon these results the null hypothesis is rejected.

Research Question 14

The fourteenth research question was: Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 10 in Rivercrest High School? The purpose of this question was to determine if the scores on the NWEA MAP test for reading that is taken in the Grade 10 could accurately predict the ACT Aspire scores on the reading section of the test for Grade 10 students. The information in the literature review claimed that NWEA MAP Tests could accurately predict the ACT Aspire scores. The researcher used simple linear regression to produce the results for this question.

A simple linear regression was calculated predicting NWEA Grade 10 reading scores on the ACT Aspire Grade 10 reading scores. Table 27 shows the ANOVA results for this regression analysis indicating that there was a statistically significant relationship between the two variables ($F_{(1,64)} = 62.62$, $p < .001$). As reported in Table 26, $R^2 = 0.487$ meaning that 48.7% of the variance in the ACT Aspire Grade 10 reading score can be explained by the predictor variable, NWEA Grade 10 reading scores. Using this

regression model, the predicted score for ACT Aspire Grade 10 reading scores (Ŷ) equals 336.46 + (0.39 times the NWEA Grade 10 reading scores).

Based upon these results the null hypothesis is rejected.

Table 26.

Regression Analysis Summary for NWEA Grade 10 Reading Scores Predicting ACT Aspire Grade 10 Reading Scores.

Variable	B	SE	95% CI	β	t	sig
(Constant)	336.46	10.79	314.92 - 358.01		31.20	.000
NWEA Grade 10 Reading Scores	.39	.05	.29 - .49	.70	7.91	.000

Note. R^2adjusted = 0.487. CI = confidence interval for B. SE = standard error.

Table 27.

ANOVA for NWEA Grade 10 Reading Scores Predicting ACT Aspire Grade 10 Reading Scores.

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	1491.75	1	1491.75	62.62	.000
	Residual	1524.57	64	23.82		
	Total	3016.32	65			

Research Question 15

The fifteenth research question was: How often do Grade 10 students' ACT Aspire scores for mathematics fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the number of times Grade 10 students' mathematics scores fell within the predicted range

provided by the NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was predicting ACT Aspire scores.

These results fail to reject the null hypothesis.

Table 28.

NWEA MAP Predictive Frequency and Percentage for Grade 10 Math.

N	# of times ACT Aspire math scores fell within predicted NWEA range	Percentage of times ACT Aspire math scores landed within predicted NWEA MAP range
67	50	74.6%

Table 28 contains the Grade 10 mathematics test data including the number of participants, number of times the ACT Aspire mathematics scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 10 ($N = 67$) participants had 50 scores (74.6% of the students) fall within the predicted NWEA MAP range.

Research Question 16

The sixteenth research question was: How often do Grade 10 students' ACT Aspire scores for reading fall in the predicted range given by NWEA MAP? The researcher used a hand-count method to calculate the frequency and percentage for the

number of times Grade 10 students' reading scores fell within the predicted range provided by NWEA MAP on the ACT Aspire. The researcher used the performance range from NWEA MAP (V1) and Actual ACT Aspire performance ranges (V2) from the raw data to conduct this analysis. The researcher chose to manually calculate the frequency and percentage. The researcher counted how many times the students' actual performance range fell into the predicted range, which was a better analysis of the data, and provided a clear picture of how well NWEA was doing what it was supposed to be doing (predicting ACT Aspire scores).

Table 29.

NWEA MAP Predictive Frequency and Percentage for Grade 10 Reading.

N	# of times ACT Aspire reading scores fell within predicted NWEA range	Percentage of times ACT Aspire reading scores fell within predicted NWEA MAP range
66	43	65.2%

Table 29 contains the Grade 10 reading test data including the number of participants, number of times the ACT Aspire reading scores fell within the predicted performance range provided by NWEA MAP, and percentage of times the ACT Aspire scores landed within the predicted performance range provided by NWEA MAP. The Grade 10 ($N = 66$) participants had 43 scores (65.2% of the students) fall within the predicted NWEA MAP range.

These results fail to reject the null hypothesis.

Chapter Summary

This chapter presented the results of the statistical analyses used to answer the 16 research questions that guided this study. The researcher reviewed 16 questions and presented information about the data. The study included inferential statistical analyses (simple linear regression), and two descriptive statistical analyses (frequency and percentage).

The regression results indicated that there was a statistically significant relationship between NWEA MAP scores and scores on the ACT Aspire across all grades (7-10) and subject areas (mathematics and reading).

The linear regression results indicated that NWEA MAP tests are significant predictors for the corresponding grade level and subject area tests for the ACT Aspire. The results also showed that the NWEA MAP Grade 8 math test was the strongest predictor of ACT Aspire performance, while the NWEA MAP Grade 9 reading test was the weakest predictor, but still significant, of ACT Aspire performance. The NWEA mathematics test was a consistently stronger predictor than the reading tests.

The frequency results indicated that most students scored within the predicted range provided by the NWEA MAP except for the Grade 8 reading test. A total of 43% of those students fell in the predicted range for ACT Aspire.

Chapter V: Discussion and Conclusions

The purpose of this study was to determine the relationship between students' scores on the NWEA MAP formative assessments that are administered to students in grades 7-10 and the ACT Aspire for students in Rivercrest High School, as well as determining how well they predicted students' scores on the ACT Aspire. The motivation for this study came from the interest in determining how to accurately monitor student performance in regards to preparing for the ACT Aspire, the standardized test that is used for school accountability in Arkansas. The researcher sought to explore the relationship between NWEA MAP and ACT Aspire for students at Rivercrest High School, interpret the data, and use the data to better inform educational practitioners in regards to formative assessment use. This chapter provides a summary of the research findings, implications for practice, and recommendations for future research. The following questions guided this study:

1. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 7 in Rivercrest High School.

2. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 7 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 7 in Rivercrest High School.

3. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

4. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School?

   H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

   H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 7 in Rivercrest High School.

5. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School?

H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 8 in Rivercrest High School.

6. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 8 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 8 in Rivercrest High School.

7. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

   H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

   H_1: Less than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

8. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School?

H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 8 in Rivercrest High School.

9. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School?

   H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

   H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 9 in Rivercrest High School.

10. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 9 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 9 in Rivercrest High School.

11. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

12. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 9 in Rivercrest High School.

13. Do NWEA MAP mathematics test scores predict ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School?

    H_0: There is no relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

    H_1: There is a relationship between NWEA MAP mathematics scores and ACT Aspire mathematics scores for students in Grade 10 in Rivercrest High School.

14. Do NWEA MAP reading test scores predict ACT Aspire reading scores for students in Grade 10 in Rivercrest High School?

H_0: There is no relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

H_1: There is a relationship between NWEA MAP reading scores and ACT Aspire reading scores for students in Grade 10 in Rivercrest High School.

15. How often do student scores on the mathematics portion of ACT Aspire fall in the predicted performance range predicted by NWEA MAP Tests for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the mathematics portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the mathematics portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

16. How often do student scores on the reading portion of ACT Aspire fall in the predicted performance range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School?

    H_0: More than 95% of the student scores on the reading portion of the ACT Aspire do not fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

    H_1: More than 95% of the student scores on the reading portion of the ACT Aspire fall in the predicted range predicted by the NWEA MAP Test for students in Grade 10 in Rivercrest High School.

Summary of Results

This study intended to determine the relationship and predictability capacity of the NWEA MAP test for the ACT Aspire. The literature review revealed that NWEA was responsible for developing, generating, and distributing linking studies that claimed to show a strong correlation to the ACT ASPIRE (Thum, 2020). Moreover, the researcher discovered through analyzing the data, there was a strong significant relationship between NWEA MAP and ACT Aspire, which supported the assertion found in the literature.

The linear regression results revealed for all NWEA assessments (seventh, eighth, ninth, and tenth for reading and mathematics), each point of the increase resulted in a direct increase on the ACT Aspire composite. These findings provided support for NWEA's (2019) assertion that MAP tests accurately predict student performance on the ACT Aspire.

The researcher utilized the predictive ACT Aspire score range (Exceeding, Ready, Close, In Need of Support) report provided by NWEA to conduct a hand-count frequency measure to explore if/how the NWEA MAP predictive scores accurately predicted the ACT Aspire performance range. The researcher found that the literature and data agreed. The NWEA scores did accurately predict the ACT Aspire performance ranges for grades 7-10 frequently.

In summary, two very important findings from the data affirmed that there was a relationship between NWEA MAP and ACT Aspire scores, and NWEA MAP scores do predict ACT Aspire scores for Rivercrest students in grades 7-10. However, further interpretation and discussion of the overall findings of this study were warranted.

Discussion

The researcher focused on two distinct findings for interpretation in this section: (a) The ability of NWEA MAP tests to predict ACT Aspire, and (b) The relationship between ACT Aspire and NWEA MAP tests. The findings for NWEA MAP tests and ACT Aspire relationships, grade-level and subject area predictability, and frequency will be discussed.

Predictability of NWEA MAP.

NWEA asserted their MAP assessment could accurately predict student scores on the ACT Aspire (NWEA, 2019). In this study, the NWEA MAP scores for eight tests (Grade 7 math, Grade 7 reading, Grade 8 math, Grade 8 reading, Grade 9 math, Grade 9 reading, Grade 10 math, and Grade 10 reading) all predicted with success and frequency the ACT Aspire scores for the corresponding tests (Grade 7 math, Grade 7 reading, Grade 8 math, Grade 8 reading, Grade 9 math, Grade 9 reading, Grade 10 math, and Grade 10 reading) for Rivercrest students. Based on NWEA's claim that the MAP and ACT Aspire scores were related and what data analysis for the students of Rivercrest confirmed, these two variables were related. Though confirmed there were differences between grade level and subject area scores. While all are good predictors, some are better than others. No other variables (such as demographics) were considered in this regression model. Therefore, while the NWEA MAP tests predict ACT Aspire in this dataset, more detail is needed for the analysis (beyond the scope of this dissertation) to fully examine the predictive nature of this relationship.

Relationship between NWEA MAP and ACT Aspire.

The literature documents the relationship between NWEA MAP and ACT Aspire (NWEA, 2019); this study confirmed that relationship for Rivercrest students

The results of the frequency and percentage counts revealed that, for Rivercrest students, the NWEA MAP tests did accurately predict student performance on the ACT Aspire. Analyses showed that NWEA MAP correctly predicted composite scores within the predictive range for the majority of students (seventh math – 67.7%, seventh reading – 64.3%, eighth math – 58.6%, ninth math – 53.6%, ninth reading – 61.3%, tenth math – 74.6 %, and tenth reading – 65.2%) on the ACT Aspire for Rivercrest students. The lone exception is the eighth-grade reading test (43.0%).

Implications for Practice

The findings from the analyses supported the idea that that scores from the NWEA MAP and ACT Aspire were related. There were several significant implications from this study that could impact educators in the immediate future and beyond, as the field of education continues to follow the ESSA requirements, and develop academic programs to address student needs.

NWEA MAP Tests.

NWEA claimed their MAP assessment could accurately predict student scores for the ACT Aspire (NWEA, 2019). This research study affirmed NWEA's claims regarding the relationship between MAP Test scores and ACT Aspire scores, by testing them on the students in grades 7-10 at Rivercrest High School. As referenced in Chapter 1, this study was limited to students in Rivercrest High School and may only be generalizable to schools that share the same testing pattern. However, the results appeared to validate

NWEA's position about relationship and predictability for ACT Aspire. This could prove beneficial in NWEA's mission to expand the number of school districts that currently use their assessment to satisfy school district's needs for accurate formative assessment data.

Accountability.

Accountability measures from the state and federal government provide school districts, administrators, teachers, and students with a rubric for identifying academic progress and growth (Williamson, 2019). ACT ASPIRE is the state of Arkansas's accountability assessment. The ADE is responsible for monitoring the state's academic accountability. ACT ASPIRE scores are the primary data mechanism used for school accountability by the Arkansas Department of Education (ADE, 2018). These results can strengthen NWEA's ability to market the importance of having a formative assessment that satisfies the needs of school districts to accurately track student progress toward proficiency on the ACT Aspire,

Administrators and teachers.

Administrators and teachers can use the findings from this study about predictability, to develop an informational guide to assist in educating students, parents, and community members about the functionality of NWEA MAP Tests. Administrators and teachers in Rivercrest can highlight the functionality of the NWEA MAP test as an instrument to measure academic progress and to predict grade-level readiness.

Students.

Student success is the primary reason for this study. The literature review for this study revealed that Arkansas mandates all public and charter school students in grades

third through tenth to take the ACT ASPIRE summative assessment each spring (ADE, 2020b). The results of this study may provide data that can help students set personal and tangible goals concerning growth and achievement. The understanding that NWEA MAP can forecast the score on the ACT Aspire can make a positive impact on motivating students to work towards achieving the highest score possible on the NWEA MAP assessment.

Implications for Future Research

This research provided two very important findings for Rivercrest High School, 1) NWEA MAP and ACT Aspire were significantly positively correlated, and 2) NWEA MAP scores accurately predicted ACT Aspire scores. However, there are questions yet to be answered that were outside the scope of this research. This section will focus on research opportunities that could provide valuable insight into a variety of topics that affect students in Rivercrest High School.

Replicate study.

School Districts that use NWEA MAP would benefit by replicating this study at the school level. This could provide every elementary and high school important information they can use to estimate how many students are on track to score at the ready level on the ACT Aspire. Students need to score at the Ready level to demonstrate being on grade-level academically. Information about student performance on the ACT Aspire could aid schools in hiring personnel to provide remediation and enrichment activities for students. Rivercrest High School would benefit from replicating this study to observe how consistent these findings perform over time.

Extend scope.

These results could prove to be beneficial for members in the education field. Specifically, high school educators could create individualized educational action plans based on NWEA MAP range prediction that would benefit all students. Future studies could also be done to explore if/how student demographic factors influence these results.

Chapter Summary

The researcher briefly summarized the findings that were discussed in Chapter 4. The findings included identifying the relationship between NWEA MAP tests and ACT Aspire, reviewing the predictive ability of NWEA MAP for ACT Aspire, and observing the grade-level comparisons and subject area comparisons. The researcher continued by providing discussion and offering clarifications for what the findings meant to educators. Chapter 5 also included implications for the NWEA MAP, the state of Arkansas, administrators and teachers, and students. Finally, the chapter concluded with possible future research topics that included replicating the study and extending the study to include more variables.

References

ACT ASPIRE. (2020a). *ACT ASPIRE overview*. Retrieved from https://www.discoveractaspire.org/assessments/

ACT ASPIRE. (2020b). *ACT ASPIRE technical manual*. Retrieved from https://www.discoveractaspire.org/wp-content/uploads/2016/08/ACT-Aspire-Summative-Technical-Manual.pdf

ACT ASPIRE. (2020c). *Performance level descriptors*. Retrieved from https://www.discoveractaspire.org/performance-level-descriptors/

Arkansas Department of Education. (2016). Arkansas Department of Education rules governing the public school rating system on annual school report cards. Little Rock, AR: Author.

Arkansas Department of Education [ADE]. (2018). *The final business rule for calculating the 2018 ESSA school index scores*. Retrieved from http://dese.ade.arkansas.gov/public/userfiles/ESEA/documents_to_Share/Draft_ESSA_Decision_Rules_012818.pdf

Bedwell, L. (2004). Data-driven instruction. *Phi Delta Kappa Fastbacks*, (516), 3-33.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5-31. https://doi.org/10.1007/s11092-008-9068-5

Buffum, A., Mattos, M., & Weber, C. (2012). Simplifying response to intervention: Four essential guiding principles. Bloomington, IN: Solution Tree Press.

Calero, J. (2015). Intensive scaffolding in an intelligent tutoring system for the learning of algebraic word problem solving. *British Journal of Educational Technology.* 46(6). https://doi.org/10.1111/bjet.12183

Corcoran, R. (2017). Preparing teachers' to raise students' mathematics learning. *International Journal of Science and Mathematics Education, 16*(3), 1-17. doi:10.1007/s10763-017-9819-1

Cronbach, L. J., & Associates (1980). *Toward reform in program evaluation*. San Francisco, CA: Jossey Bass.

DuFour, R. (2006). *Learning by doing: A handbook for professional learning communities at work.* Bloomington, IN: Solution Tree.

Fox, C. (2008). The time is now. *T.H.E. Journal, 35*(7), 10-11.

Gardner, D., Larsen, Y., Baker, W., Campbell, A., Crosby, E., Foster, Jr, C. A., & Wallace, R. (1983). *A nation at risk*. Retrieved from https://files.eric.ed.gov/fulltext/ED226006.pdf

Goslin, D. (1963). *Search for Ability, The: Standardized Testing in Social Perspective*. Russell Sage Foundation. Retrieved January 23, 2021, from http://www.jstor.org/stable/10.7758/9781610446358

Great School Partnership. (2013). The *glossary of educational reform.* Retrieved from https://www.edglossary.org/summative-assessment/

Great School Partnership. (2014a). The *glossary of educational reform.* Retrieved from https://www.edglossary.org/high-stakes-testing/

Great School Partnership. (2014b). The *glossary of educational reform.* Retrieved from https://www.edglossary.org/formative-assessment/

Guthrie, J. W., & Springer, M. G. (2004). A Nation at Risk revisited: Did "wrong" reasoning result in "right" results? At what cost? *Peabody Journal of Education*, *79*(1), 7-35. http://dx.doi.org/10.1207/s15327930pje7901_2

Hart, S. (2015). *Arkansas shuts door on PARCC*. Retrieved from https://truthinamericaneducation.com/common-core-assessments/arkansas-shuts-door-on-parcc/

Harter, E. (1999). How educational expenditures relate to student achievement: Insights from Texas elementary schools. *Journal of Education Finance, 24*(3), 281-302. Retrieved from https://www.jstor.org/stable/40704068

Hartley, D. (2010). Distributed leadership according to the evidence. *Educational Management Administration & Leadership, 38(1), 138–140*. https://doi.org/10.1177/1741143210038001030l

Harvey, S., & Goudvis, A. (2000). Strategies that work: Teaching comprehension to enhance understanding. York, ME.: Stenhouse.

Jago, C. (2005). Raising test scores one element at a time. Voices from the middle. *Urbana, 13*(2), 48-49. Retrieved from https://search.proquest.com/openview/fe4fb10276cef99f6c56c5cd356af529/1?pq-origsite=gscholar&cbl=33274

Jenkins, J., Lock, L., & Lock, M. (2018). Leadership-A critical bridge to accountability. *Delta Kappa Gamma Bulletin, 84(3)*, 10-15.

Johnson, M. (2015, December 29). *Can the ACT ASPIRE predict your ACT score* [Blog post]. Retrieved from https://www.latutors123.com/2015/12/29/can-the-act-aspire-predict-your-act-score/

Ladd, H. F., Muschkin, C. G., & Dodge, K. A. (2014). From birth to school: Early childhood initiatives and third-grade outcomes in North Carolina. *Journal of Policy Analysis and Management, 33*(1), 162-187. Retrieved from https://doi.org/10.1002/pam.21734

Madaus, G. F., & Stufflebeam, D. L. (1984). Educational evaluation and accountability: A review of quality assurance efforts. *The American Behavioral Scientist*, *27*(5), 649. Retrieved from https://doi.org/10.1177/000276484027005007

McDaniel, S. (2017). A responsive Tier 2 process for a middle school student with behavior problems: Preventing school failure: *Alternative Education for Children and Youth*, *61*(4), 280-288. https://doi.org/10.1080/1045988X.2016.1275503

Mellard, D. F., & Johnson, E. (2008). *RTI: A practitioner's guide to implementing response to intervention.* Corwin Press. https://doi.org/10.4135/9781483329772

Meredith, T. (2016). What makes public schools great? *Indianapolis Business Journal, 37*(30), 11. Retrieved from http://libcatalog.atu.edu:2189/apps/ doc/a465436954/ ITOF?u=aktechuniv&sid=ITOF&xid=4aed8935

Molnar, M. (2017). Market is booming for digital formative assessments; Schools are expected to spend nearly $1.6 billion this year on classroom assessment tools. *Education Week, 36*(32), 28. Retrieved from https://www.edweek.org/teaching-learning/market-is-booming-for-digital-formative-assessments/2017/05

NWEA. (2019). *Predicting performance on the ACT Aspire summative assessment based on MAP Growth scores.* Portland, OR: Author.

Phelps, R. (2005). *Defending standardized testing*. Mahwah, N.J.: L. Erlbaum Associates.

Resnick, D. (1982). History of educational testing. In A. K. Wigdor & W. R. Gardner (Eds.), *Ability testing: Uses, consequences, and controversies* (pp. 173-194). Washington, DC: National Academy Press.

Skedsmo, G., & Huber, S. G. (2019). Forms and practices of accountability in education. *Educational Assessment, Evaluation and Accountability, 31*(3), 251-255. doi:http://libcatalog.atu.edu:2097/10.1007/s11092-019-09305-8

Taylor, B., Pearson, P., Peterson, D., & Rodriguez, M. (2003). Reading growth in high-poverty classrooms: The influence of teacher practices that encourage cognitive engagement in literacy learning. *Elementary School Journal, 104*(1), 3-28. https://doi.org/10.1086/499740

The Understood Team. (2018). *The difference between the Every Student Succeeds Act and No Child Left Behind*. Retrieved from https://www.understood.org/en/school-learning/your-childs-rights/basics-about-childs-rights/the-difference-between-the-every-student-succeeds-act-and-no-child-left-behind

Thum, Y. M., & Kuhfeld, M. (2020). *NWEA 2020 MAP Growth achievement status and growth norms for students and schools. NWEA Research Report*. Retrieved from https://teach.MAPnwea.org/impl/normsResearchStudy.pdf

Tyack, D. B. (1974). *The one best system: A history of American urban education*. Cambridge, MA: Harvard University Press.

VanDerHeyden, A., Witt, J., & Gilbertson, D. (2007). A multi-year evaluation of the effects of a Response to Intervention (RTI) model on identification of children for special education. *Journal of School Psychology, 45*(2), 225-256. doi.org/10.1016/j.jsp.2006.11.004

Vaughn, S. (2016). Effects from a randomized control trial comparing researcher and school-implemented treatments with fourth graders with significant reading difficulties. *Journal of Research on Educational Effectiveness*, *9*(1)23-44. doi:10.1080/19345747.2015.1126386

Werner, K. (2018). *What's new with MAP Reading Fluency?* Retrieved from https://www.nwea.org/blog/2018/whats-new-MAP-reading-fluency-more-great-features/

Whitaker, B. (2018). Assessment of the ASPIRE (ACT Supplemental Preparation in Rural Education) Program: A tool to increase ACT college entrance examination scores of rural high school students. *NACTA Journal, 62*(4), 339-345. Retrieved from https://www.nactateachers.org/attachments/article/2796/13%20%20Braxton%20T.%20Whitaker.pdf

Wiliam, D. (2010). Standardized testing and school accountability. *Educational Psychologist, 45*(2), 107-122. https://doi.org/10.1080/00461521003703060

Williamson, J. (2019). *Predictive ability of ACT Aspire for ACT at Star City High School* [Unpublished doctoral dissertation]. Arkansas Tech University.

Appendices

Appendix A

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ARKANSAS TECH UNIVERSITY

March 5, 2021

To Whom It May Concern:

The Arkansas Tech University Institutional Review Board Chair has deemed the application for Harry
Alvis's proposed research, entitled "Measuring the Predictive Ability of NWEA MAP Tests for ACT Aspire at Rivercrest High School," to be exempt under Category 2. Research activities in which the only involvement of human subjects will be in one or more of the exempt categories defined by the federal regulations are given an exempt determination rather than IRB approval. Thus, no IRB approval number has been assigned to this study. The IRB approves for the researcher(s) to proceed with his project.

Please note that, in the event that any of the parameters of the study change, the researcher may be required to submit an amended application.

Sincerely,

Melissa Darnell, Ph.D.
Institutional Review Board Member
Arkansas Tech University

RIVERCREST SCHOOL DISTRICT

Sally Bennett sally.bennett@smccolts.com

02-26-2021

To Whom It May Concern:

The Rivercrest School District will allow the researcher (Harry Alvis) to collect the archived student testing data required for his research study.

Strict confidentiality must be maintained to protect student participants. No identifying characteristics will be provided in this data request, nor can they be included in any published paper produced as a result of completion of the study.

Sincerely,

Sally Bennett

Sally Bennett

Superintendent

1700 W. State Hwy 14, Wilson, AR 72395

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