Common Formative Assessments Effect on Student Achievement on Washington State Science Assessments

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FACULTY APPROVAL

Common Formative Assessments Effect on Student

Achievement on Washington State Science Assessments.

Approved for the Faculty

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ABSTRACT

This project looked at the implementation of common formative assessments in 10th grade biology classrooms at White River High School and the achievement scores on Washington State Science Assessments. Data was collected from the 2009 and 2011 state assessments. Common formative assessments were implemented in 2010. A *t* score was determined and used to test for significance. The data showed significance at all levels and the hypothesis was supported and the null hypothesis was rejected at all levels. After the implementation of common formative assessments in the biology courses, the White River School District experienced increased student achievement on the state science assessment. It was recommended to continue using common formative assessments across all curricular areas.

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CHAPTER 1

Introduction

Background for the Project

In 2001, the George W. Bush Administration passed the No Child Left Behind Act (NCLB). This act required states to establish and implement standardized tests to all students at certain grade levels. The NCLB Act led Washington State to require students to pass the Washington Assessment of Student Learning (WASL) in math, reading, writing and science. The WASL was later changed to the Measurement of Student Progress (MSP) in elementary and middle school and the High School Proficiency Exam (HSPE) in high school. The state then moved to the requirement of End of Course Exams (EOC) in algebra, geometry, and biology. The class of 2015 was required to pass the Biology EOC (OSPI www.k12.wa.assessment/default.aspx).

In 2012, all students that were enrolled in biology were required to take the test in the spring during the last three weeks of school, but not required to pass it to meet state graduation requirements. The class of 2015 was required to pass the Biology EOC exam to meet graduation requirements. The EOC exam was based of the Washington K-12 Science Learning Standards and given to the students that were enrolled in biology in grades seven through twelve.

The White River School District (WRSD) implemented Professional Learning Communities (PLC) in the fall of 2006 which provided opportunities for

teachers to collaborate on student learning. During the 2006–07 and 2007-08 school year, the Life Science/Biology PLC created unit plans with common standards and developed a common course scope and sequence. In the 2008-09 school year the Life Science PLC created and implemented common summative assessments. This allowed all students to be assessed the same in all biology courses for all unit exams. However, by the time students were assessed it was too late to correct the misconceptions or perceptions of students. So during the 2009-10 school year the Biology PLC team designed and implemented common formative assessments for each unit. The Biology PLC created at least two common formative assessments per unit of instruction. The team designed them together and ensured they were given to each student enrolled in biology. Common formative assessments were used to identify students who struggled early in units and allowed for them to be retaught and possible other interventions took place. Any student that didn't meet standard or 80% on an assessment were identified by each teacher and then the teachers planned how they retaught to meet their needs. Teachers were also able to see what classes had the highest count of students that met standard and then shared how they taught the material or the activities the students participated in.

Statement of the Problem

Only 28.3%of 10^{th} grade students met standard on the 2009 tenth grade Science WASL. The state required the class of 2015 to pass the state assessment

or Biology EOC exam to graduate. There was a need to change the biology curriculum. The biology teachers had developed a common scope and sequence to ensure all students were engaged in the same curriculum but assessed them individually at the end of the unit. After they attended a Doug Reeves Grading Conference, the teachers decided to implement common formative assessments throughout the course.

Purpose of the Project

The purpose of this project was to identify if the implementation of common formative assessments at White River High School (WRHS) in biology courses increased student achievement on the tenth grade state assessment. The class of 2015 was required to pass the state assessment to meet graduation requirements. The WRHS tenth grade science assessment scores needed to increase. They were below state average.

Delimitations

The research project included all students taking biology at WRHS and three teachers that taught biology at WRHS. Data was used from the Washington State tenth grade science assessment from 2009 and 2011. There were 237 students who took the Washington State Science Assessment of WASL in 2009 and 276 students who took the Washington State Science Assessment of HSPE in 2011. The enrollment at White River High School during the 2008-09 school year was 1292 students and in 2010-11 the enrollment was 1221 students. The ethnic

make-up at White River High School in 2008-09 was as follows: American Indian 2.2%, Asian 1.8%, Pacific Islander 0.2%, Black 1.0%, Hispanic 4.3%, and White 88.8%. The ethnic make-up of White River during the 2010-11 school year was as follows: American Indian 2%, Asian 0.6%, Pacific Islander 0.2%, Black 0.4%, Hispanic 6.1%, and White 83.3%. The population of students who qualified for free and reduced lunch in 2008-09 was 22.5% and the population who qualified for free and reduced lunch in 2010-11 was 26.1%.

Assumptions

Assumptions for this project included that the three participating biology teachers implemented common formative assessments for the 2009-10 and 2010-11 and that common formative assessments were not used in the 2008-09 school year. Also, that each teacher was certified to teach biology and held a Washington State Teaching Certificate or endorsement in biology. The next assumption was that all students in the biology courses participated in the state assessment and came to learn and did their best.

Hypothesis

When 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment increased. The State Assessment of WASL and HSPE both identified student achievement levels.

Null Hypothesis:

When 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment did not change. The State Assessment of WASL and HSPE both identified student achievement levels.

Significance of the Project

The significance of this project was to identify if common formative assessments increased student achievement. The NCLB Act required states to implement state assessments that all students took at certain grade levels. Many students didn't meet standard on the state assessment. The state assessments were tied to graduation meaning the students were not only held accountable to meeting the district graduation requirements they also had to pass all the state assessments. Students were allowed to retake the assessment, but if they couldn't pass it they didn't graduation.

Procedure

The following procedures were implemented for this special project:

1. Permission to conduct research at White River High School was granted by Principal Mike Hagadone (see Appendix A).
2. A review of selected literature was conducted through Heritage University.

3. A meeting was conducted to outline the timeline of components of the PLC with the Life Science PLC team.
4. Data was requested from the Director of Assessment and Curriculum in the White River School District for the 10th grade state science assessments.
5. Data was received from the Director of Assessment and Curriculum in the White River School District.
6. Data from the 2009 Science WASL and the 2011 Science HSPE was collected and a T-Test was conducted (See appendix B)
7. Results from the study were examined, evaluated, and conclusions were drawn.
8. Data was shared with White River School District Administrators that showed the effectiveness of common formative assessments.

Definition of Terms

assessment. A test that measured a student's ability, knowledge, or skill about a designated topic or topics.

common formative assessment. Assessments made by a collaborative teaching team or group given by all stakeholders and data taken to analyze student knowledge and used to modify instruction and provide intervention.

formative assessment. Formal or informal assessments given to find out understanding on instruction and provided feedback of student understanding and provided the ability to modify instruction and provide intervention.

professional learning communities. Collaborative communities within schools with similar subjects or grade level teams that allowed for teachers to collaborate on learning, collect data, analyze findings, provide interventions or enrichment, and differentiate to meet student needs.

scope and sequence. Organization and timeline of implementation of units in a course.

standardized tests. An assessment administered, scored, and interpreted in a consistent manner anywhere that it was given.

summative assessments. Assessments given at the end of a unit or course that examined the overall understanding or knowledge on the topic or course.

unit plans. Outline of standards, learning targets, learning strategies, assignments, assessments, interventions, or enrichments for each topic of study.

Acronyms

AYP. Adequate Yearly Progress

EOC. End of Course

ESEA. Elementary and Secondary Education Act

HSPE. High School Proficiency Exam

MSP. Measurement of Student Progress

NCLB. No Child Left Behind

OSPI. Office of Superintendent of Public Instruction

PLC. Professional Learning Community

WASL. Washington Assessment of Student Learning

WRHS. White River High School

WRSD. White River School District

CHAPTER 2

Review of Selected Literature

Introduction

The author selected literature to support the research of the project. The author chose books and journal articles about Professional Learning Communities, formative assessments, No Child Left Behind, and collaboration. The literature built shared knowledge with the researcher. This chapter has been organized around the following topics (a) Professional Learning Communities, (b) Formative Assessments, (c) No Child Left Behind, and (d) Collaboration.

Professional Learning Communities

Professional Learning Communities had become popular in many school districts in the late 1990's and 2000's. Districts implemented PLC's at all levels and had grade level teams of teachers and staff work together at the elementary levels and often had departmental or like-course PLC's at the secondary levels. However, so many schools implemented them and treated them like a program that the validity of PLC's came into question. The results that districts saw when they stayed the course and implemented PLC's at all levels including support staff and administration, in student achievement were undeniable(DuFour, DuFour, Eaker, and Many, 2010). Many school districts adjusted their schedules and provided teachers with time during the school day. Some districts elected to have a late start day where teachers came at the contracted time and students arrived

later. Other districts opted to have an early release day where students came at normal time but left early while staff members stayed and had their PLC meetings.

Professional Learning Communities were defined by DuFour, DuFour, Eaker and Many in *Learning by Doing* as, "an ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action based research to achieve better results from the students they serve (p. 11)." Professional Learning Communities were composed of grade level teams or department teams within schools and school districts to create a guaranteed and viable curriculum. PLC's were not a program, they were a process that was ongoing and affected the culture of the school. In the book, Getting Started: Recruiting Schools to Become Professional Learning Communities, Eaker, DuFour, and DuFour described the need for a collaborative culture and that the members of a PLC are expected to contribute not invited to attend (2002). Collaboration was richly embedded in the PLC model.

Hord and Sommers defined PLC's through five attributes or components; shared beliefs, values, and vision, shared and supportive leadership, collective learning and its application, supportive conditions, and shared personal practice (2008). Teachers met in their PLC teams identified essential outcomes for each course, developed learning targets, designed common formative assessments,

collected and analyzed data, shared instructional strategies, modified instruction as needed, and engaged in collective inquiry (Eaker, Keating, 2011).

Professional Learning Communities were built around three big ideas. The three big ideas were 1) ensuring that students learn, 2) a culture of collaboration, and 3) a focus on results (DuFour, 2004). DuFour with co-authors DuFour, Eaker, and Many also identified four questions that guided the work of a PLC. These questions were:

1. What knowledge and skills should every student acquire as a result of this unit of instruction?
2. How will we know when each student has acquired the essential knowledge and skills?
3. How will we respond when some students do not learn?
4. How will we extend and enrich the learning for students who are already proficient (2010, p. 28)?

As previously stated, PLC teams used the four guiding questions to frame their PLC meetings. The PLC developed a scope and sequence, designed their curriculum, created and implemented common formative assessments, collected and analyzed data, and provided interventions and enrichment for students. No one worked alone anymore, they were supported by the team.

Formative Assessments

Assessments were defined as the act of assessing or evaluation (Dictionary.com). The way teachers assessed students changed over time. Teachers moved from assessment for the purpose of the grade to assessment of student learning (Stiggins, Chappuis, 2008). Assessment of student learning ensured that students grades represented what they actually learned or were able to do.

DuFour, DuFour, Eaker, and Many explained that common assessment suggested that all students were assessed using the same instrument and according to the same criteria and provided feedback to the teacher about what students learned. Common formative assessments allowed for both the teacher and the learner to understand where the student's progress was. They went on to explain that it wasn't the content that made the assessment formative, it was what was done with the data. If an assessment was given and data was collected but nothing was done with the data, it served no purpose. But if educators and learners used that data to improve student progress it was a formative assessment (2010). Ainsworth and Viegut stated the, "true purpose of the assessment must be, first and foremost, to inform instructional decision making" (2006, p. 21). In their common formative assessment model the assessments were linked to power standards. The power standards were the key concepts that each student learned throughout the course.

Teachers used assessments to measure student progress. Some assessments were informal and done through observation, dialogue, questioning or anecdotal note taking. When a formal method was needed teachers created an assessment that matched their purpose and allowed students to complete it, which showed their learning (Ainsworth, Viegut, 2006)

"Common formative assessments for learning can do for classroom teachers what large scale assessments of learning, by design, cannot (Ainsworth, Viegut, 2006, p. 2)". Formative assessments were designed by a collaborative group of educators either by grade level or by department team and given to the students by all the teachers involved throughout the year. They were used to assess student knowledge for particular standards and educators then gathered data, analyzed the results, and saw where students struggled before the summative assessment at the end of the unit (Ainsworth, Viegut, 2006).

DuFour, DuFour, Eaker, and Many explained there were three things that occurred in order for the assessment to be called formative. First, the assessment identified the students that struggled. Second, the identified students were provided extra time and support on the concept. And last, the students were given multiple opportunities to meet standard or show mastery of the concept (2010)

Doug Reeves suggested that it was important to keep the formative assessments short with only fifteen to twenty items with a maximum of two

extended response questions. This allowed for focus on the most important ideas (2010).

No Child Left Behind

On January 8, 2002, President George W. Bush signed the No Child Left Behind (NCLB) Act of 2001. This act required state tests in reading and math in grades 3-8 and once during high school and that students were expected to meet or exceed standards by the 2013-14 school year in reading and mathematics (OSPI www.k12.wa.us/esea/NCLB.aspx).

The main purpose of the act was to close the achievement gaps, "by providing all children with a fair, equal, and significant opportunity to obtain a high-quality education (OSPI www.k12.wa.us/esea/NCLB.aspx)." The NCLB Act had four major focus areas: accountability, flexibility, research-based education, and parent options. Accountability referred to ensuring that disadvantaged students achieved academic proficiency. Flexibility allowed for districts to use monies from the federal government in different ways to increase student achievement. Research-based education referred to modeling educational programs and practices after proven research based models. And NCLB allowed for parents that had students attending Title I schools more choices when choosing which school their child would attend.

The NCLB Act also mandated that states establish state academic standards and state testing systems. Washington state established standards in

reading, math, science, writing, communication, social studies, art, health and fitness, HIV sexual health education, early learning, educational technology, world languages, international education, environment and sustainability, and English language development (www.k12.wa.us/CurriculumInstruct/default.aspx). However the state chose not to test each of these areas and to mandate testing in Reading, Writing, Math, and Science. The first state exam implemented was the Washington Assessment of Student Learning (WASL) which was first implemented in the spring of 1997. In 2009 the WASL was replaced with the Measurements of Student Progress (MSP) for grades 3-8, and the High School Proficiency Exam (HSPE) for high school students. Then in the spring of 2011 there was no longer a HSPE exam in mathematics, instead an End of Course (EOC) Exam was implemented for Algebra and Geometry. In 2012, the science HSPE was also eliminated and replaced with an EOC in Biology. The class of 2015 was required to pass the EOC in Biology (OSPI www.k12.wa.us/assessment/StateTesting/default.aspx).

Schools were required to meet Adequate Yearly Progress (AYP) as part of the Elementary and Secondary Education Act (ESEA) and NCLB. Adequate yearly progress was determined by state reading and math scores and the state set the baseline or starting point. Then each year in gradual increments the bar was raised so that in the school year 2013-2014 all students would achieve proficiency

in Math and Reading. It was believed that Science will also become a part of AYP.

At the high school level, NCLB also required other areas of student performance be measured including graduation rate and in the elementary and middle schools they must report unexcused absence rates. Districts were required to meet their yearly AYP goals as a whole and in disaggregated student populations that included: race/ ethnicity, students with disabilities, limited English proficient students, and student economically disadvantaged students. However, each group needed to contain enough members to be statistically accurate and not single out or identify and individual. The group had to contain at least thirty members.

A school could meet AYP in two ways. The first way was by demonstrating that all groups had met the designated goals in reading and mathematics. The second was by a provision called "safe harbor". This provision permitted "schools with one or more subgroups not making the goals to skill make AYP if the percentage of students not making AYP in the school declined by at least ten percent in each student category and the other indicator (graduation rate or unexcused absences) was still met," (OSPI www.k12.wa.us.esea/AYP/default.aspx).

If schools did not meet AYP there were consequences. If a school was receiving Title I, Part A funds and had two consecutive years of not meeting AYP

they entered step one of the consequences. Step one included the school being identified as a school of improvement and had to notify all parents, could receive federal funds for technical assistance in improve performance, developed or revised the school improvement plant within three months of being identified as a school of improvement, offered parents and opportunity to transfer their student to another public school of choice, and paid for the transportation cost.

A school not making AYP for three consecutive years entered step two of consequences. Step two included notification to the parents, continued to offer school of choice, required to offer supplemental educational services to the parents for their students. The cost was incurred by the district or school.

Step three was for those schools that did not meet AYP for four years. Step three included being identified for corrective action and notification to the parents, continued school of choice, and options that included replacement of certain staff, implementation of new curriculum, decreased management authority, appointed outside expert to advise the school, extended school day or school year, and to restructure the internal organization of the school. Those who still did not achieve AYP by the fifth year entered step four and were identified for restructuring. They continued school of choice and supplemental educational services, and began planning of restructure. The final step was step five and included those schools who did not make AYP for six years and required them to implement the restructure plan, and choose from the following options:

replacement most of relevant staff, an outside entity be contracted to operate the school, possibly undergo a state takeover, or undertake any other major restructuring of the school. The final steps were drastic and aimed to complete full implementation of NCLB (OSPI www.k12.wa.us/esea/AYP/default.aspx) .

No Child Left Behind Act of 2001 required schools to increase rigor and achievement and to capture those students who were dropping out and under achieving in school. The government step regulations and asked the states to oversee implementation and state testing. Everyone from parent to teacher to administrator was impacted by NCLB.

Collaboration

Collaboration was defined as the act of working with another or others in a joint intellectual effort (freedictionary.com). Educators across the nation collaborated on a day to day basis and with the movement of Professional Learning Communities (PLC's) had more opportunity to do that within the school day. Mike Mattos stated as co-author of *The Collaborative Administrator* that "To ensure high levels of learning for all students, we must align our school culture and structures to the essential characteristics of being a PLC. These characteristics are: common mission, vision, values and goals, collaborative culture, collective inquiry, action orientation, continuous improvement, and focus on results," (2008, p. 14).

Collaboration in a school looked differently from one school to the next. Some collaborated vertically amongst subject matters; some collaborated within like classes, while others collaborated by grade level. Collaboration was about student learning, assessments, and even data. In the book *Data Teams: The Big Picture –Looking at Data Teams Through a Collaborative Lens* Laura Besser wrote about how education has looked at data for a long time, but usually after the fact and when it is too late to do something about what the data says. She introduced the data team process which included being timely. She state "collaboration and the use of data are independent practices, but they are also interdependent practices" (2010, p. 2). Without collaboration about the data and the power of many minds data wasn't evaluated completely and used to its potential. The overall goal of the implantation of collaborative data teams was increased student achievement.

Hoard and Sommers spoke about collaboration in their book, *Guiding Professional Learning Communities-Voices From Research and Practice,* as one of the seven C's of leadership: communication, collaboration, coaching, change, conflict, creativity, and courage. They stated that "collaboration is critical to the success of PLCs and most initiatives." They state "it is easier to go into your classroom and teach your own way without working with anyone else. Of course, the group or system doesn't benefit from what you know, and you don't benefit from what others know," (2008, p. 33). The ability to share ideas, lessons,

assessments only made the classroom a more powerful place. Teachers who collaborated with their colleagues had the benefit of shared knowledge and saw increased student achievement.

In *Learning by Doing*, DuFour, DuFour, Eaker, and Many, encouraged readers to consider what teachers were collaborating about. They stated, "the fact that teachers collaborate will do nothing to improve school learning. The pertinent question is not are they collaborating? But rather, what are they collaborating about, "(2006, p. 91). They stressed that professionals must focus on the right things and to increase student achievement, the overall purpose of student achievement. The right things included collaborating about what teachers wanted their students to know, how would they know if the students had learned it, how will they respond to the students when they didn't learn it, and what will they do when the students know or already know it or the four questions that drive PLCs.

Researchers agreed that collaboration is vital when it came to student achievement. However, the collaboration needed to be about the right things. Collaboration could be aligned vertically, by course or grade level and could include lesson planning, assessments, and data teams. Collaboration and student achievement went hand and hand.

Summary

The focus of this chapter was to address the research for the topics of (a) Professional Learning Communities, (b) Formative Assessments, (c) No Child Left Behind, and (d) Collaboration. Many researches views, thoughts, and research were discussed.

CHAPTER 3

Methodology and Treatment of the Data

Introduction

Did the implementation of common formative assessments increase student achievement on the state science assessment in the White River School District? The author has organized this chapter around the following topics: (a) Methodology, (b) Participants, (c) Instruments, (d) Design, (e) Procedure, (f) Treatment of Data, and (g) Summary.

Methodology

The researcher first reviewed selected literature for this special project. The literature was derived from Heritage University's online database, internet searches, and from individual professional libraries. After the review of literature was conducted, permission was granted by White River High School Principal, Mike Hagadone to conduct the research.

The author then implemented an experimental research method on two independent groups. The research was a quantitative study. The manipulated variable in this special project was the use of common formative assessments. The purpose of the experimental research was to test the project hypothesis and to support or not support a cause-effect relationship between the implementation of common formative assessments in biology and student achievement on the state assessment.

Participants

The author had an experimental and control group for this study. The control group included 237 10th grades students from the 2008-2009 school year who did not take common formative assessments in their 10th grade biology class. The experimental group consisted of 276 10th grade students from the 2010-2011 school year from White River High School that received at least two common formative assessments per unit of instruction on biology. All students were enrolled in a biology course at White River High School.

Instruments

The author used two instruments to gather data in this special project. The first instrument was the Washington Assessment of Student Learning (WASL) and the second was the High School Proficiency Exam (HSPE).

Both the WASL and HSPE were state assessments given to students in the state of Washington. The 2009 science data used WASL scores and the 2011 science data was derived from HSPE scores. The state of Washington moved from administering the WASL to administering the HSPE in 2010. Both instruments were based off of state science standards.

Students took the 2009 WASL and the 2011 HSPE in April of the respective year. The assessments were administered by teachers at White River High School during the school day on specified testing days. The days were determined by the Office of Superintendent of Public Instruction (OSPI). Once

completed the tests were gathered by district officials and sent to the state. The state scored the assessment and sent results back to the respective school districts. The scores ranged from a 0-500. A 400 meant the student met standard and passed the state assessment The author used the data and analyzed the results (see Appendix B).

An internal validity issue with these instruments in this study was that two different tests were used to identify student achievement in science. However, both tests were established for the Washington K-12 Science Standards. A comparison of district scores to state averages was conducted and will be shared in Chapter 4.

Design

This experimental study was categorized as a quasi-experimental design with one manipulated variable or treatment. The manipulated variable was the implementation of common formative assessments to the experimental group. It was categorized as quasi-experimental rather than true experimental because the participant groups were predetermined not randomly selected. Every student who took the 2009 and the 2011 state science assessment and was enrolled in biology were part of the control or experimental group. In the category of quasi-experimental this research was more specifically a nonequivalent control group design. No pretest was administered to either group, the treatment or variable was implemented with the experimental group, and both groups received a posttest.

Procedure

The following procedures were implemented for this special project:

1. Permission to conduct research at White River High School was granted by Principal Mike Hagadone (see Appendix A)
2. A review of selected literature was conducted through Heritage University, the internet, and professional educational libraries.
3. A meeting was held with the Life Science PLC to outline the timeline of growth and implementation of PLC practices which included unit planning, scope and sequence, common summative assessment, common formative assessment, and data analysis.
4. The control group was identified as the 2008-2009 10^{th} grade biology students who took the 2009 WASL. There were 237 participants in the control group.
5. The experimental group was identified as the 2010-2011 10^{th} grade biology students who took the 2011 HSPE. There were 276 participants in the experimental group.
6. Data was requested from the Director of Assessment and Curriculum in the WRSD for the 10^{th} grade state assessments.
7. Data was received from the Director of Assessment and Curriculum in the WRSD.

8. Data was evaluated and specific data related to author's research on state science assessments was organized and separated by author for analysis and evaluation.
9. The median and a T-test was conducted from the data of the 2009 Science WASL and the 2011 Science HSPE (See appendix B)
10. Results from the study were examined, evaluated, and conclusions were drawn.
11. Data was shared with WRSD Administrators that showed the effectiveness of common formative assessments.

Treatment of Data

The data gathered from the 2009 10th Grade WASL and the 2011 10th Grade Science HSPE assessments were examined using the Microsoft Excel Program. This data was interpreted using the STATPAK program provided by Heritage University. The STATPAK determined the mean and t-value of the state science assessment scores gathered by the researcher.

Summary

The author designed this chapter to discuss the methodology and treatment of data for this research on the implementation of common formative assessments as it related to student achievement on the state 10th grade science assessment at White River High School. This chapter also identified and explained the design

of the project and the data that was collected. The analysis of the data from this project were discussed in Chapter 4.

CHAPTER 4

Analysis of the Data

Introduction

After collecting the data, was there an increase in student achievement in science due to the implementation of common formative assessments? The author has organized this chapter to analyze the data with the following topics: (a) Description of the Environment, (b) Hypothesis/ Research Question, (c) Null Hypothesis, (d) Results of the Study, (e) Findings, (f) Discussion, and (g) Summary.

Description of the Environment

The research was conducted at WRHS in the WRSD located in Buckley, Washington. The purpose of the research was to determine if the use of common formative assessment in biology courses increased student achievement on the state science assessments. This research was important due to low achievement of the state assessment and the need for students to pass the EOC in biology in 2015.

The participants of this project were 10th grade biology students during the 2008-2009 school year and the 2010-2011 school year. The 2008-2009 students were the control group and did not participate in common formative assessments. The experimental group was the 2010-2011 biology students who received common formative assessments. A minimum of two common formative

assessments were given in each unit of study by biology teachers to the experimental group. The control group took the 10th Grade Science WASL and the experimental group took the 10th Grade Science HSPE in April of their respective years. Data was collected from the 2009 10th Grade Science WASL and the 2011 10th Grade Science HSPE respectively.

Hypothesis

The author hypothesized that when 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment increased. The State Assessment identified student achievement.

Null Hypothesis

The author stated the null hypothesis that when 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment did not change. The significance levels used in this study were .05, .01, and .001.

Results of the Study

The results of the study provided the data to attend to the author's hypothesis. The control group and experimental group completed the 10th grade science assessment. The assessment scores were organized using Microsoft Excel and evaluated using the STATPAK program provided by Heritage University which produced statistical data and associated values. Based on the analysis, the

experimental participants had higher achievement on the 10th grade state science assessment compared to the control group.

Table 1

10^{th} Grade State Science Assessment Data

Participant	Posttest Data 2009
1	410
2	401
3	389
4	416
5	389
6	377
7	380
8	400
9	386
10	426
11	438
12	404
13	423
14	386
15	426
16	438
17	404
.	.
.	.
237	413

Table 2

10^{th} Grade State Science Assessment Data

Participant	Posttest Data 2011
1	426
2	366
3	366
4	390
5	420
6	471
7	394
8	390
9	337
10	315
11	420
12	414
13	482
14	390
15	376
16	438
17	327
.	.
.	.
276	347

A *t* score of 5.89 was determined using the STATPAK program. The values of the state assessment score of all participants in the control and experimental group were used to determine the *t* value. The mean of the control group was 375.33 and the mean of the treatment or experimental group was 398.93. The degrees of freedom were 511. The evidence clearly suggested that the implementation of common formative assessments increase student achievement on state assessments.

Table 3

Statpak Analysis

Statistic	Value
No. of scores in Group X	276
Sum of Scores in Group X	110105.00
Mean of Group X	398.93
Sum of Squared scores in Group X	44485429.00
SS of Group X	561113.69
No. of Scores in Group Y	237
Sum of Scores in Group Y	88954.00
Mean of Group Y	375.33
Sum of Squared scores in Group Y	33871094.00
SS of Group Y	483692.67
t-value	5.89
Degrees of freedom	511

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t = \frac{398.83 - 375.33}{\sqrt{\left(\frac{561113.69 + 483692.67}{276 + 237 - 2}\right)\left(\frac{1}{276} + \frac{1}{237}\right)}}$$

t=5.89

Significance was determined for $p \geq .05$, .01, and .001 using 120 degrees of freedom, the largest degrees of freedom the chart recognizes (Gay, Mills, Airasian, 2009). The calculated value of *t* was 5.89, which was larger than the threshold value of *t* at .05, .01, and .001. The threshold value at .001 with 120 degrees of freedom was 3.373. The null hypothesis was rejected at $p \geq 05$, .01. and .001, thus supporting the hypothesis at all levels of significance (2009, pg. 563). The results suggested clear effect on student achievement due to the implementation of common formative assessments in biology on the state assessment.

Table 4

Distribution of t

	p		
df	.05	.01	.001
120	1.980	2.617	3.373

Findings

Students who received common formative assessments in biology demonstrated higher achievement on the Washington State Assessment than those students who did not. The mean score of the control group on the state assessment was 375.33 and the mean score of the experimental group on the state assessment was 398.83 and average increase of 23.5 points. The researcher used the STATPAK program and found a *t* value of 5.89. The results indicated that students who receive instruction using common formative assessments had a 99.99% probability of increased academic achievement on the state science assessment (Gay, Mills, Airasian, 2009).

Significance was determined for $p \geq .05$, .01, and .001 from the derived *t* value of 5.89. The *t* value was larger than the threshold value for 120 degrees of freedom thus the hypothesis when 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment increased was supported all levels of significance. The null hypothesis when 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment did not change was rejected at all levels. It was evident that the implementation of common formative assessments in biology saw a significant increase in state assessment scores.

Discussion

The author's expectations were confirmed through the data obtained and analyzed. The implementation of common formative assessments in biology courses at WRHS significantly increased student achievement on the Washington State Science Assessments.

Teachers in the life science PLC moved from assessment for the purpose of the grade to assessment of student learning (Stiggins, Chappuis, 2008). Assessment of student learning ensured that students' grades represented what they actually learned or were able to do. Through the PLC process teachers implemented common formative assessments aligned to state standards and assessed the data and provided intervention as needed.

The formative assessments were designed by a collaborative group of biology teachers. The teachers continuously worked with one another to evaluate assessments and shared best practices and knowledge to one another. The common formative assessments were used to assess student knowledge for particular standards and educators then gathered data, analyzed the results, and saw where students struggled before the summative assessment at the end of the unit (Ainsworth, Viegut, 2006).

Students enrolled in the biology courses participated in the Washington State Assessment known as the High School Proficiency Exam (HSPE), previously known as the Washington Assessment of Student Learning (WASL).

The assessment was aligned to state science standards developed by the Office of Superintendent of Public Instruction (OSPI). The score over 400 showed proficiency on the assessment.

Summary

The author's research provided support of the implementation of common formative assessments in biology. Tenth grade students at White River High School enrolled in biology in 2009 and 2011 took Washington State Science Assessments and provided comparable data to evaluate increased student achievement with the implementation of common formative assessments.

The author hypothesized that when 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment increased. The State Assessment identified student achievement. The Statpak analysis determined a *t* score of 5.89. The null hypothesis was rejected at $p \geq .05$, .01 and .001 (Gay, Mills, & Airasian, 2009). The data analysis evidence suggested that common formative assessments increased student achievement and supported the researcher's hypothesis.

Students who received common formative assessments in biology performed significantly better on the Washington State Science Assessment than students who did not have common formative assessments in their biology course. The PLC model and collaboration of teachers may have positively influenced

student achievement and the results of this study. The author's expectations were confirmed from the data analysis and research of common formative assessments.

CHAPTER 5

Summary, Conclusions, and Recommendations

Introduction

Did the implementation of common formative assessments in biology increase student achievement on the Washington State Science Assessment? Should common formative assessments be implemented across the curriculum? The author has organized this chapter to review this study with the following topics: (a) Summary, (b) Conclusions, and (c) Recommendations.

Summary

The statistical evidence found from the researches project provided data that showed the implementation of common formative assessments positively impacted student achievement on the Washington State Science Assessment. All biology teachers implemented common formative assessments throughout every biology course during the 2009-2010 school year the. These assessments were designed to assess state standards. Data was collected from the 2009 Washington Assessment of Student Learning (WASL). Every 10^{th} grader completed biology and participated in the WASL. Data was also collected from the 2011 High School Proficiency Exam (HSPE) results of the 10^{th} grade biology students from WRHS. The analyzed data determined significance of the implementation of common formative assessments.

The author reviewed selected literature to support the research. The author considered the research to conduct and quasi experimental study and decided to use data from all 10th grade biology students from 2008-2009 and 2010-2011 at WRHS through Washington State Science Assessment scores.

The researcher measured effectiveness of common formative assessments by comparing WASL and HSPE scores. The author performed a quasi-experimental rather than true experimental because the participant groups were predetermined not randomly selected. The research looked at student achievement scores with the implementation of common formative assessments. The author hypothesized when 10th grade biology teachers used common formative assessments then student achievement on the 10th grade Science State Assessment increased. The quasi experimental research produced a *t* score of 5.89 and rejected the null hypothesis at $p \geq 05$, .01, and .001 which supported the author's hypothesis. A significant increase of student achievement on the state science assessment was confirmed for those students who received common formative assessments with the calculated *t* score.

Conclusions

The author's hypothesis was supported. Student achievement increased on the state science assessment with the use of common formative assessments. A *t* test was conducted and significance was determined for $p \geq .05$, .01, and .001 for a *t* value of 5.89. The evidence clearly suggested that the implementation of

common formative assessments increase student achievement on state assessments.

The author's literature review also supported the data and confirmed that common formative assessments improve student achievement. The literate review supported collaboration among common subject matter and/or grade level. The implementation of common formative assessments allowed for teachers to analyze student assessment scores and provide intervention as needed.

Recommendations

Based on the results of the study, the author recommended that the WRSD continue using common formative assessments in Biology. Also, based on the tremendous increase in student achievement in biology, common formative assessments would benefit all subjects.

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Appendix A

I Mike Hagadone, Principal of White River High School, have given Amy Miller permission to conduct her research project on the academic achievement of students on state assessments with common assessments in biology here at White River High School. In the research project, students of White River High school was referenced by a given number and not mentioned by student name. No personal information was used in this research project that looked at student grades before and after a system of intervention was put into place.

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Mike Hagadone - Principal

Appendix B

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t = \frac{398.83 - 375.33}{\sqrt{\left(\frac{561113.69 + 483692.67}{276 + 237 - 2}\right)\left(\frac{1}{276} + \frac{1}{237}\right)}}$$

t=5.89

Appendix C

SchoolName 2009 State Assessment DATA	Science Score	ScienceStudent Level	ScienceScale Score	ScienceMet Standard
White River High School	38	L3	410	Y
White River High School	35	L3	401	Y
White River High School	31	L2	389	N
White River High School	40	L3	416	Y
White River High School	31	L2	389	N
White River High School	27	L2	377	N
White River High School	28	L2	380	N
White River High School	34	L3	400	Y
White River High School	30	L2	386	N
White River High School	43	L3	426	Y
White River High School	46	L3	438	Y
White River High School	36	L3	404	Y
White River High School	42	L3	423	Y
White River High School	18	L1	346	N
White River High School	13	L1	324	N
White River High School	39	L3	413	Y
White River High School	37	L3	407	Y
White River High School	26	L2	375	N
White River High School	33	L2	395	N
White River High School	25	L1	371	N
White River High School	40	L3	416	Y
White River High School	20	L1	354	N
White River High School	41	L3	420	Y
White River High School	40	L3	416	Y
White River High School	14	L1	329	N
White River High School	33	L2	395	N
White River High School	34	L3	400	Y
White River High School	16	L1	338	N
White River High School	24	L1	367	N
White River High School	48	L3	446	Y
White River High School	42	L3	423	Y

White River High School	30	L2	386	N
White River High School	41	L3	420	Y
White River High School	43	L3	426	Y
White River High School	41	L3	420	Y
White River High School	29	L2	383	N
White River High School	18	L1	346	N
White River High School	47	L3	442	Y
White River High School	17	L1	342	N
White River High School	17	L1	342	N
White River High School	18	L1	346	N
White River High School	30	L2	386	N
White River High School	26	L2	375	N
White River High School	33	L2	395	N
White River High School	9	L1	301	N
White River High School	31	L2	389	N
White River High School	11	L1	313	N
White River High School	30	L2	386	N
White River High School	40	L3	416	Y
White River High School	46	L3	438	Y
White River High School	40	L3	416	Y
White River High School	27	L2	377	N
White River High School	4	L1	255	N
White River High School	30	L2	386	N
White River High School	44	L3	430	Y
White River High School	5	L1	267	N
White River High School	46	L3	438	Y
White River High School	27	L2	377	N
White River High School	31	L2	389	N
White River High School	24	L1	367	N
White River High School	22	L1	361	N
White River High School	7	L1	286	N
White River High School	47	L3	442	Y
White River High School	44	L3	430	Y
White River High School	15	L1	334	N
White River High School	27	L2	377	N
White River High School	7	L1	286	N
White River High School	23	L1	364	N

White River High School	26	L2	375	N
White River High School	37	L3	407	Y
White River High School	8	L1	294	N
White River High School	25	L1	371	N
White River High School	35	L3	401	Y
White River High School	18	L1	346	N
White River High School	45	L3	434	Y
White River High School	40	L3	416	Y
White River High School	42	L3	423	Y
White River High School	16	L1	338	N
White River High School	21	L1	357	N
White River High School	24	L1	367	N
White River High School	14	L1	329	N
White River High School	9	L1	301	N
White River High School	18	L1	346	N
White River High School	51	L4	462	Y
White River High School	11	L1	313	N
White River High School	13	L1	324	N
White River High School	29	L2	383	N
White River High School	37	L3	407	Y
White River High School	11	L1	313	N
White River High School	28	L2	380	N
White River High School	17	L1	342	N
Collins Alternative Programs	12	L1	319	N
White River High School	21	L1	357	N
White River High School	45	L3	434	Y
White River High School	36	L3	404	Y
White River High School	31	L2	389	N
White River High School	40	L3	416	Y
White River High School	22	L1	361	N
White River High School	38	L3	410	Y
White River High School	45	L3	434	Y
White River High School	17	L1	342	N
White River High School	32	L2	392	N
White River High School	40	L3	416	Y
White River High School	13	L1	324	N
White River High School	6	L1	277	N

White River High School	37	L3	407	Y
White River High School	34	L3	400	Y
White River High School	9	L1	301	N
White River High School	9	L1	301	N
White River High School	13	L1	324	N
White River High School	9	L1	301	N
White River High School	48	L3	446	Y
White River High School	13	L1	324	N
White River High School	30	L2	386	N
White River High School	42	L3	423	Y
White River High School	19	L1	350	N
White River High School	33	L2	395	N
White River High School	23	L1	364	N
White River High School	48	L3	446	Y
White River High School	41	L3	420	Y
White River High School	31	L2	389	N
White River High School	37	L3	407	Y
White River High School	34	L3	400	Y
White River High School	15	L1	334	N
White River High School	8	L1	294	N
White River High School	16	L1	338	N
White River High School	22	L1	361	N
White River High School	8	L1	294	N
White River High School	40	L3	416	Y
White River High School	35	L3	401	Y
White River High School	17	L1	342	N
White River High School	40	L3	416	Y
White River High School	34	L3	400	Y
White River High School	27	L2	377	N
White River High School	11	L1	313	N
White River High School	37	L3	407	Y
White River High School	24	L1	367	N
White River High School	29	L2	383	N
White River High School	38	L3	410	Y
White River High School	47	L3	442	Y
White River High School	48	L3	446	Y
White River High School	23	L1	364	N

White River High School	20	L1	354	N
White River High School	33	L2	395	N
White River High School	9	L1	301	N
White River High School	40	L3	416	Y
White River High School	40	L3	416	Y
White River High School	26	L2	375	N
White River High School	37	L3	407	Y
White River High School	33	L2	395	N
White River High School	36	L3	404	Y
White River High School	30	L2	386	N
White River High School	7	L1	286	N
White River High School	41	L3	420	Y
White River High School	36	L3	404	Y
White River High School	32	L2	392	N
White River High School	39	L3	413	Y
White River High School	36	L3	404	Y
White River High School	49	L3	451	Y
White River High School	30	L2	386	N
White River High School	44	L3	430	Y
White River High School	5	L1	267	N
White River High School	31	L2	389	N
White River High School	20	L1	354	N
White River High School	31	L2	389	N
White River High School	5	L1	267	N
White River High School	31	L2	389	N
White River High School	42	L3	423	Y
White River High School	21	L1	357	N
White River High School	33	L2	395	N
White River High School	41	L3	420	Y
White River High School	39	L3	413	Y
White River High School	11	L1	313	N
White River High School	33	L2	395	N
White River High School	26	L2	375	N
White River High School	30	L2	386	N
White River High School	13	L1	324	N
White River High School	36	L3	404	Y
White River High School	4	L1	255	N

White River High School	30	L2	386	N
White River High School	45	L3	434	Y
White River High School	12	L1	319	N
White River High School	34	L3	400	Y
White River High School	33	L2	395	N
White River High School	42	L3	423	Y
White River High School	47	L3	442	Y
White River High School	25	L1	371	N
White River High School	14	L1	329	N
White River High School	50	L4	458	Y
White River High School	20	L1	354	N
White River High School	14	L1	329	N
White River High School	14	L1	329	N
White River High School	22	L1	361	N
White River High School	7	L1	286	N
White River High School	11	L1	313	N
White River High School	36	L3	404	Y
White River High School	7	L1	286	N
White River High School	49	L3	451	Y
White River High School	17	L1	342	N
White River High School	19	L1	350	N
White River High School	26	L2	375	N
White River High School	32	L2	392	N
White River High School	24	L1	367	N
White River High School	11	L1	313	N
White River High School	23	L1	364	N
White River High School	16	L1	338	N
White River High School	28	L2	380	N
White River High School	39	L3	413	Y
White River High School	26	L2	375	N
White River High School	10	L1	307	N
White River High School	23	L1	364	N
White River High School	34	L3	400	Y
White River High School	31	L2	389	N
White River High School	11	L1	313	N
White River High School	35	L3	401	Y
White River High School	22	L1	361	N

White River High School	51	L4	462	Y
White River High School	27	L2	377	N
White River High School	35	L3	401	Y
White River High School	22	L1	361	N
White River High School	24	L1	367	N
White River High School	13	L1	324	N
White River High School	35	L3	401	Y
White River High School	19	L1	350	N
White River High School	34	L3	400	Y
White River High School	7	L1	286	N
White River High School	12	L1	319	N
White River High School	41	L3	420	Y
White River High School	22	L1	361	N
White River High School	25	L1	371	N
White River High School	12	L1	319	N
White River High School	25	L1	371	N
White River High School	19	L1	350	N
White River High School	12	L1	319	N
White River High School	37	L3	407	Y
White River High School	38	L3	410	Y
White River High School	39	L3	413	Y

Appendix D

School Name 2011 State Assessment Data	Science Score	Science ScaleScore	Science Student Level	Science Met Standard
White River High School	34	426	L3	Y
White River High School	22	366	L1	N
White River High School	22	366	L1	N
White River High School	27	390	L2	N
White River High School	33	420	L3	Y
White River High School	40	471	L4	Y
White River High School	28	394	L2	N
White River High School	27	390	L2	N
White River High School	16	337	L1	N
White River High School	12	315	L1	N
White River High School	33	420	L3	Y
White River High School	32	414	L3	Y
White River High School	41	482	L4	Y
White River High School	27	390	L2	N
White River High School	24	376	L2	N
White River High School	27	390	L2	N
White River High School	36	438	L3	Y
White River High School	14	327	L1	N
White River High School	37	445	L3	Y
White River High School	21	362	L1	N
White River High School	40	471	L4	Y
White River High School	37	445	L3	Y
White River High School	29	400	L3	Y
White River High School	33	420	L3	Y
White River High School	34	426	L3	Y
White River High School	37	445	L3	Y
White River High School	19	352	L1	N
White River High School	29	400	L3	Y
White River High School	32	414	L3	Y
White River High School	30	404	L3	Y

White River High School	37	445	L3	Y
White River High School	29	400	L3	Y
White River High School	30	404	L3	Y
White River High School	33	420	L3	Y
White River High School	34	426	L3	Y
White River High School	26	385	L2	N
White River High School	32	414	L3	Y
White River High School	7	280	L1	N
White River High School	33	420	L3	Y
White River High School	38	458	L4	Y
White River High School	37	445	L3	Y
White River High School	30	404	L3	Y
White River High School	22	366	L1	N
White River High School	30	404	L3	Y
White River High School	36	438	L3	Y
White River High School	30	404	L3	Y
White River High School	30	404	L3	Y
White River High School	24	24	L4	Y
White River High School	7	280	L1	N
White River High School	28	394	L2	N
White River High School	22	366	L1	N
White River High School	39	461	L4	Y
White River High School	36	438	L3	Y
White River High School	31	409	L3	Y
White River High School	30	404	L3	Y
White River High School	31	409	L3	Y
White River High School	28	394	L2	N
White River High School	29	400	L3	Y
White River High School	16	337	L1	N
White River High School	31	409	L3	Y
White River High School	30	404	L3	Y
White River High School	25	380	L2	N
White River High School	30	404	L3	Y
White River High School	38	458	L4	Y
White River High School	29	400	L3	Y
White River High School	38	458	L4	Y
White River High School	31	409	L3	Y

White River High School	22	366	L1	N
White River High School	33	420	L3	Y
White River High School	32	414	L3	Y
White River High School	33	420	L3	Y
White River High School	30	404	L3	Y
White River High School	26	385	L2	N
White River High School	30	404	L3	Y
White River High School	36	438	L3	Y
White River High School	25	380	L2	N
White River High School	38	458	L4	Y
White River High School	40	471	L4	Y
White River High School	35	432	L3	Y
White River High School	24	376	L2	N
White River High School	38	458	L4	Y
White River High School	23	375	L2	N
White River High School	30	404	L3	Y
White River High School	28	394	L2	N
White River High School	36	438	L3	Y
White River High School	30	404	L3	Y
White River High School	25	380	L2	N
White River High School	22	366	L1	N
White River High School	34	426	L3	Y
White River High School	26	385	L2	N
White River High School	28	394	L2	N
White River High School	29	400	L3	Y
White River High School	27	390	L2	N
White River High School	38	458	L4	Y
White River High School	20	357	L1	N
White River High School	31	409	L3	Y
White River High School	30	404	L3	Y
White River High School	26	385	L2	N
White River High School	33	420	L3	Y
White River High School	27	390	L2	N
White River High School	20	357	L1	N
White River High School	27	390	L2	N
White River High School	29	400	L3	Y
White River High School	33	420	L3	Y

White River High School	27	390	L2	N
White River High School	33	420	L3	Y
White River High School	38	458	L4	Y
White River High School	26	385	L2	N
White River High School	26	385	L2	N
White River High School	23	375	L2	N
White River High School	29	400	L3	Y
White River High School	30	404	L3	Y
White River High School	37	445	L3	Y
White River High School	33	420	L3	Y
White River High School	36	438	L3	Y
White River High School	25	380	L2	N
White River High School	16	337	L1	N
White River High School	14	327	L1	N
White River High School	21	362	L1	N
White River High School	24	376	L2	N
White River High School	26	385	L2	N
White River High School	28	394	L2	N
White River High School	19	352	L1	N
White River High School	28	394	L2	N
White River High School	41	482	L4	Y
White River High School	24	376	L2	N
White River High School	23	375	L2	N
White River High School	38	458	L4	Y
White River High School	37	445	L3	Y
White River High School	21	362	L1	N
White River High School	30	404	L3	Y
White River High School	31	409	L3	Y
White River High School	35	432	L3	Y
White River High School	32	414	L3	Y
White River High School	38	458	L4	Y
White River High School	33	420	L3	Y
White River High School	35	432	L3	Y
White River High School	35	432	L3	Y
White River High School	20	357	L1	N
White River High School	38	458	L4	Y
White River High School	23	375	L2	N

White River High School	12	315	L1	N
White River High School	25	380	L2	N
White River High School	31	409	L3	Y
White River High School	19	352	L1	N
White River High School	20	357	L1	N
White River High School	35	432	L3	Y
White River High School	23	375	L2	N
White River High School	20	357	L1	N
White River High School	11	309	L1	N
White River High School	34	426	L3	Y
White River High School	33	420	L3	Y
White River High School	21	362	L1	N
White River High School	33	420	L3	Y
White River High School	32	414	L3	Y
White River High School	32	414	L3	Y
White River High School	29	400	L3	Y
White River High School	28	394	L2	N
White River High School	36	438	L3	Y
White River High School	38	458	L4	Y
White River High School	30	404	L3	Y
White River High School	31	409	L3	Y
White River High School	34	426	L3	Y
White River High School	34	426	L3	Y
White River High School	12	315	L1	N
White River High School	42	497	L4	Y
White River High School	30	404	L3	Y
White River High School	31	409	L3	Y
White River High School	40	471	L4	Y
White River High School	35	432	L3	Y
White River High School	32	414	L3	Y
White River High School	29	400	L3	Y
White River High School	30	404	L3	Y
White River High School	21	362	L1	N
White River High School	32	414	L3	Y
White River High School	24	376	L2	N
White River High School	33	420	L3	Y
White River High School	30	404	L3	Y

White River High School	31	409	L3	Y
White River High School	36	438	L3	Y
White River High School	21	362	L1	N
White River High School	37	445	L3	Y
White River High School	26	385	L2	N
White River High School	12	315	L1	N
White River High School	29	400	L3	Y
White River High School	27	390	L2	N
White River High School	31	409	L3	Y
White River High School	23	375	L2	N
White River High School	30	404	L3	Y
White River High School	35	432	L3	Y
White River High School	31	409	L3	Y
White River High School	37	445	L3	Y
White River High School	20	357	L1	N
White River High School	38	458	L4	Y
White River High School	30	404	L3	Y
White River High School	39	461	L4	Y
White River High School	25	380	L2	N
White River High School	27	390	L2	N
White River High School	27	390	L2	N
White River High School	35	432	L3	Y
White River High School	29	400	L3	Y
White River High School	19	352	L1	N
White River High School	27	390	L2	N
White River High School	32	414	L3	Y
White River High School	26	385	L2	N
White River High School	38	458	L4	Y
White River High School	32	414	L3	Y
White River High School	19	352	L1	N
White River High School	23	375	L2	N
White River High School	17	342	L1	N
White River High School	16	337	L1	N
White River High School	25	380	L2	N
White River High School	39	461	L4	Y
White River High School	33	420	L3	Y
White River High School	19	352	L1	N

White River High School	6	271	L1	N
White River High School	35	432	L3	Y
White River High School	20	357	L1	N
White River High School	34	426	L3	Y
White River High School	33	420	L3	Y
White River High School	29	400	L3	Y
White River High School	39	461	L4	Y
White River High School	36	438	L3	Y
White River High School	30	404	L3	Y
White River High School	20	357	L1	N
White River High School	28	394	L2	N
White River High School	38	458	L4	Y
White River High School	11	309	L1	N
White River High School	23	375	BA	Y
White River High School	34	426	L3	Y
White River High School	30	404	L3	Y
White River High School	35	432	L3	Y
White River High School	24	376	L2	N
White River High School	24	376	L2	N
White River High School	32	414	L3	Y
White River High School	23	375	L2	N
White River High School	36	438	L3	Y
White River High School	26	385	L2	N
White River High School	22	366	L1	N
White River High School	31	409	L3	Y
White River High School	14	327	L1	N
White River High School	40	471	L4	Y
White River High School	27	390	L2	N
White River High School	18	347	L1	N
White River High School	30	404	L3	Y
White River High School	33	420	L3	Y
White River High School	31	409	L3	Y
White River High School	6	271	L1	N
White River High School	35	432	L3	Y
White River High School	32	414	L3	Y
White River High School	29	400	L3	Y
White River High School	27	390	L2	N

White River High School	28	394	L2	N
White River High School	33	420	L3	Y
White River High School	28	394	L2	N
White River High School	27	390	L2	N
White River High School	29	400	L3	Y
White River High School	40	471	L4	Y
White River High School	35	432	L3	Y
White River High School	27	390	L2	N
White River High School	12	315	L1	N
White River High School	23	375	L2	N
White River High School	24	376	L2	N
White River High School	31	409	L3	Y
White River High School	27	390	L2	N
White River High School	29	400	L3	Y
White River High School	26	385	L2	N
White River High School	38	458	L4	Y
White River High School	35	432	L3	Y
White River High School	16	337	L1	N
White River High School	39	461	L4	Y
White River High School	10	302	L1	N
White River High School	22	366	L1	N
White River High School	28	394	L2	N
White River High School	31	409	L3	Y
White River High School	18	347	L1	N