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Impacts of MTSS on the Performance of Struggling Students

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Abstract

The purpose of this paper is to share the impact and results of implementing multi-tiered system of supports (MTSS) in Oskaloosa High School. The high school was showing an increase in struggling students, which led to an increasing proportion of the student population failing courses. The study is an overview of the changes over the past three years, evaluating how struggling students were supported prior to and after the implementation of a robust MTSS program. Specific data on the number of students receiving a failing grade at the end of each trimester was collected and analyzed. Results show a positive effect on student performance and confidence after the implementation of a MTSS system. The old system of gathering students after a less-than-proficient assessment has been sidelined for a much more effective in-progress monitoring system that is now called MTSS at Oskaloosa High School.

Impacts of MTSS on the Performance of Struggling Students

MTSS has been sweeping across Iowa and the nation as a tool to best educate all students. At Oskaloosa High School, the desire for this program originated from a growing list of students requiring additional support, determined after analyzing end of the trimester data. Students that were not finding success in the academic classroom were struggling to meet requirements, such as course standards and graduation. Teachers were also becoming frustrated with the increasing gap between struggling and unchallenged students in the classroom. These concerns set the stage for the development and implementation of a new method of meeting students' needs.

Literature Review

Two major approaches have been introduced into schools nationwide to address deficiencies in social and academic outcomes. The first proposed method is response to intervention (RTI), while the second is school-wide positive behavior support (SWPBS). Both use a tiered approach, in which all students are addressed by providing the optimum intensity level of support. The primary focus of RTI is to amply support all students in the area of academics, and while SWPBS is also a preventative support, it additionally aims to address social skills and behavior (Freeman, Miller, & Newcomer, 2015). According to the *Journal of Emotional and Behavioral Disorders*, both academic and behavior supports include four key components. First, it is vital that evidence-based curricular or instructional practices are used in the classroom. Second, databased decision making is implemented at all levels of support. Third, a problem-solving procedure is put in place. Fourth, team-based approaches are implemented (Hawken, Vincent, Schumann, 2008).

Multi-tiered system of supports (MTSS) is a student support system that combines the strongest components of response to intervention and student-wide positive behavior support system and then builds upon them to create a robust program that will strengthen the overall performance of all students. For future reference RTI, SWPBS, and MTSS can be thought of as one system and can be used interchangeably. The power of MTSS begins and ends with teams of teachers, as they will be the determining factor in data-driven decisions. The primary mission of MTSS is to ensure that all students receive the most optimal level of instruction possible. Much like RTI, students are given adequate support to reach mastery at a high level based upon individual needs. The power of MTSS is that students receive targeted instruction at the time of need, rather than waiting until the student falls so far behind that they fail a course or even qualify for special education services. Previously, this was referred to as the discrepancy formula, in which federal law (IDEIA, 2004) dictated that a certain achievement was necessary based upon an IQ result. The essential timing of MTSS support is what makes it an innovative idea, setting it apart from other need-based interventions. (RTI Action Network)

The Iowa Department of Education states that the Iowa MTSS framework is comprised of five major components. Curriculum and instruction that is evidence-based must be administered to students at a universal level. Students must be individually screened for academic, social, and emotional needs. Evidence-based, instructional interventions must be implemented at the targeted audience and at the appropriate intensive level of rigor. These instructional interventions must be differentiated based upon individualized student needs. Students that receive targeted instruction must be continually monitored to ensure that best practice is being conducted. Finally, it is vital

that all decisions are data-based and best serve the need of the students (Iowa Department of Education, 2016).

Legislation

Response to intervention, also known as multi-tiered system of supports, was developed in response to two major pieces of legislation. In 2002, The No Child Left Behind Act (NCLB) was passed and set out to bring accountability measures to all school districts. Most people associated the law with a requirement for standardized testing and an aim for 100% proficiency, but it consisted of much more in its entirety. The law was actually an expansion of the Education of All Handicapped Children Act in 1975. The original purpose was to provide a high-quality education for all students, as only one in five students with disabilities were educated or had laws to ensure that education for such students was a possibility at that time (U.S Department of Education, 2010). The pressure to attain the goals set forth by the lawmakers was intense. Goals were lofty, such as: all students will attain proficiency or better in reading and mathematics by 2013-2014, all English language learners (ELLs) will become proficient in English, all teachers will be highly qualified by 2005-2006, all students will be educated in safe, drug-free environments, all students will graduate from high school (McCann, 2017).

In 2004, the Individuals with Disabilities Education and Improvement Act (IDEIA) was passed in an effort to improve education for children with disabilities. The focus was to increase classroom rigor and identification of students in need. A specific component of the act was focused on methodology enabling schools to use a guide to identify children in need of extra support due to specific learning or behavioral needs. Section 1414(B)(6) of the IDEIA states, “In determining whether a child has a specific learning disability, a local

educational agency may use a process that determines if the child responds to scientific, research-based intervention as part of the evaluation process" (IDEIA, 2004, p.5). This portion of the IDEIA led to development of the model we now know as RTI. This new model put aside the traditional IQ testing in favor of a more accurate and individualized technique. All these important legislative milestones were crucial steps in the progression toward the development of MTSS.

Explanation of MTSS

All students fall into one of three tiers in the MTSS system. In this dynamic pyramid system, tier one is comprised of high-quality instruction with a heterogeneous mixture of students that will target 80% of the student body. The students in tier one will show mastery on core content in addition to social, emotional, and behavioral development. A myriad of research-based instructional techniques are used to help students achieve optimal mastery of content including project-based learning (PBL), differentiation, workshop model, guided inquiry, and self-paced learning. In a well-functioning MTSS, students receive research-based instruction founded on data and suited to their diverse readiness levels, interests, and learning styles in order to expand the opportunity for growth (McLaughlin & Talbert, 1993). The goal of all districts utilizing an MTSS program is that teachers are properly trained to proactively manage academics and monitor social behaviors simultaneously. The benefit would not only be the production of higher achieving students, but also a reduction in school discipline interventions (Sugai, Horner, & McIntosh, 2008).

Students that do not respond to tier one-differentiation methods with success are moved to tier two, in which they will receive small or large group re-teaching or

supplemental instructional support. It is suggested that roughly 10-15% of the student body should be in tier two at a given time. (RTI Action Network) Students that are selected for this tier may be referred to a problem-solving team, which incorporates a multidisciplinary approach to create an appropriate intervention for success (Simon, 2016). It is important to note that this pyramid scheme is dynamic and students may move from one tier to another in a matter of days. This small group instructional time is not meant for merely additional work time to complete work, rather, it is targeted instruction based upon a frailty in a specific skill or behavior. Each and every district will need to adapt their tier two services based upon the needs of the students. When the percentage of the student population needing additional support reaches the threshold of 20% (of the overall population), specially designed programs should be instituted for early and on-going interventions. (Simon, 2016) It is important to note that under the umbrella of MTSS, students must be supported in a variety of ways, including academic, social, behavioral, psychological, and a wide array of home life factors.

If a student is unable to master content in a tier two setting, they are moved into tier three in the MTSS pyramid. In this tier, students are assigned one-on-one or two-to-one interventions with desired teachers. Students in this setting receive highly customized instruction that is adapted to their specific needs. Only 5% of the student population should be involved in this third and final tier (RTI Action Network, n.d.). Only after students fail to succeed in tier 3 should they be evaluated for special education services. RTI theory suggests that special education is the invisible fourth tier, yet should be considered completely separate from the three-tiered structure of MTSS.

Hypothesis

After reviewing literature focusing on optimal support of all students, it became apparent that a robust rollout of a MTSS program would meet the needs of all students while also allowing teachers to make data-driven decisions at the time of need rather than after a less-than-proficient assessment or artifact of work. The program would also provide an opportunity for small group and one-on-one intervention that students desire to meet rigorous classroom expectations. The hypothesis was that a robust MTSS program would show a significant reduction in the number of struggling students attempting to find success in academic courses at Oskaloosa High School.

Methodology

Participants

Oskaloosa is a rural town in southeast Iowa with a population of just under 12,000 people. The high school currently has 705 students, 53% of which are male, while 47% are female. The demographic breakdown consists of 8.5% minority students enrolled and 91.5% Caucasian. The high school has a 16:1 student to teacher ratio. Oskaloosa employs 45 full-time teachers at the high school. The students who attend Oskaloosa High School generally come from a low to middle-income household. In the 2016-17 school year, 45% of students qualified for free or reduced lunch and 11% of the students are receiving special education services.

Starting in the 2013-14 school year, a grave concern with student performance emerged. Teachers and administrators noticed an increase in the high school population receiving a failing grade, with many students earning multiple F's. From the first trimester to the third trimester, the number of students receiving a failing grade ranged from 156 to

as high as 215 during the second trimester – a very large percentage when considering a school that supports 700 students. Efforts to address the rampant deficiency in academic performance needed to be made. MTSS was introduced in the second trimester of the 2015-16 school year as an approach that would serve to assist our struggling students, as well as challenge our unchallenged students. MTSS is a tiered approach to identifying both learning needs and behavioral obstacles. Rebecca Alber of Edutopia (2011) said it best, "On paper, RTI [MTSS] is a pro-active intervention model (not a program) that offers targeted academic support to struggling students. It also curtails the practice of too many students being inappropriately referred to special education" (p.1).

Data Collection

Student grade data was collected and organized from the past 10 school years at Oskaloosa High School, which is a grade 9-12 building. The primary focus of the data collection was aimed at students that had failed high school courses. In a school with roughly 700 students, it was essential to delineate a cohesive, standardized collection and management of data so correlations and relationships could be analyzed and identified. Data was grouped by grades and compiled into trimesters to find trends. The number of students that struggled to meet minimal requirements over the course of this 10-year span remained relatively constant; therefore, the focus of the data was zoomed in to a three-year window. This would allow for detailed analysis of students before and after the implementation of a MTSS program.

Data Analysis

By arranging the collected data into trimesters, trends could be analyzed for comparisons of similar courses taught in specified trimesters, while also tracking grades as

they progress from year to year. Snapshots of data looking at trends in grade level performance over a period (in this case, each year) will be referred to as an "apples to apples" comparison, for future reference. Meanwhile, when looking at grade progressions and longitudinal tracking of student data as they progress through high school, analysis will be referred to as an "apples to oranges" comparison. Further explanation and analysis will be included in the results portion of the study.

Results

The implementation of the MTSS program at Oskaloosa High School began during the 2nd trimester of the 2015-2016 school year and will serve as a centerpiece for comparison of struggling students prior to and after the enactment of MTSS. For the sake of this study, struggling students are defined as those students that do not meet minimum proficiency standards, resulting in a failed course(s). Prior to the inception of the program (MTSS) over a 10-year window, the average number of failed courses during the first, second and third trimesters were 141, 190.9, and 181 respectfully. Failed courses at Oskaloosa are defined as 59% or lower on the standard grading scale. Some teachers have transitioned from a traditional grading scale to standard based, however, all reported grades at Oskaloosa are reported out in letter grades based upon percentages.

The results of this study will be shared in three basic formats. First, a three-year span, which will show the number of failed courses prior to and after the implementation of MTSS. The number of failed courses will be broken into trimesters for ease of overall comparison. Secondly, data will be shared in a yearly snapshot, which will be called apple to apples comparison. Courses will be compared based upon previous years; individual students will be different, with the focus on the specific course. Finally, a comparison of

longitudinal trends tracking struggling students and the number of non-proficient grades as they progress from grade to grade will be referred to as apples to oranges.

Three-Year Span

The three-year span of data was arranged as an overview to look at the number of non-proficient grades by grade level in order to gain insight into the impacts that MTSS is having on the student population at Oskaloosa High School. Three figures will be referenced in this portion of the results including first trimester data (Figure 1), second trimester (Figure 2), and third trimester (Figure 3). When looking chronologically at the first year of MTSS implementation, starting with the second trimester of the 2015-16 school year through the second trimester of the 2016-17 school year, the reduction in number of failing courses by grade was significant. When the first year of MTSS was broken into trimesters, each grade level saw reductions in failing grades of students. The second trimester (Figure 2) saw a reduction in the ninth, tenth, and twelfth grades, while the eleventh grade remained at the same level of failed courses. The second trimester of implementation, trimester three of the 2015-2016 school year (Figure 3) saw a decrease in the number of failed courses in comparison to the previous year in the ninth and tenth grades, while showing an increase of eight failing grades at the eleventh grade. A modest increase of one failing grade was shown in the twelfth grade. Even with increases in the eleventh and twelfth grades, the overall high school number of failed courses dropped by 22 courses. In the final trimester of year one of MTSS implementation, trimester one of the 2016-2017 school year (Figure 1) saw a reduction in each of the grade levels when compared to the previous year at the same time.

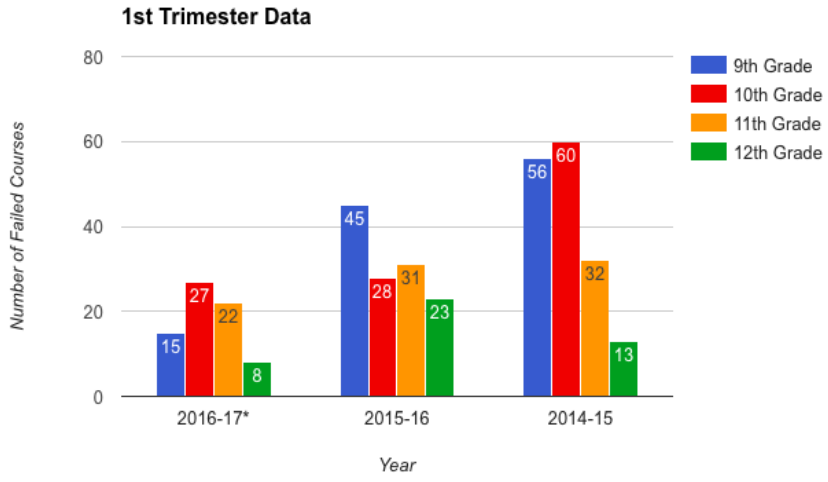

Figure 1: The number of failed courses was collected by grade level and arranged by year during the 1st trimester over the past three school years.
*Indicates that 2016-17 school year was the only year in this range to have MTSS.

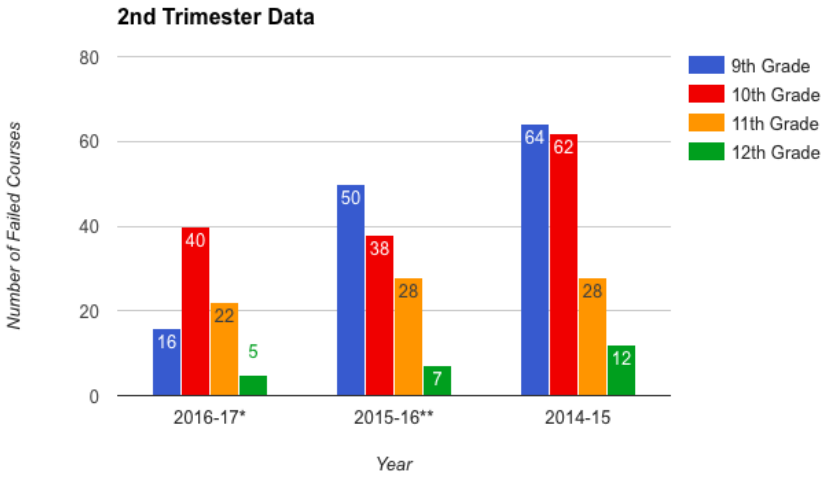

Figure 2: The number of failed courses was collected by grade level and arranged by year during the 2nd trimester over the past three school years.
*Indicates that MTSS was in the second year of implementation
**Indicates that the 2015-16 school year was the first year to implement MTSS.

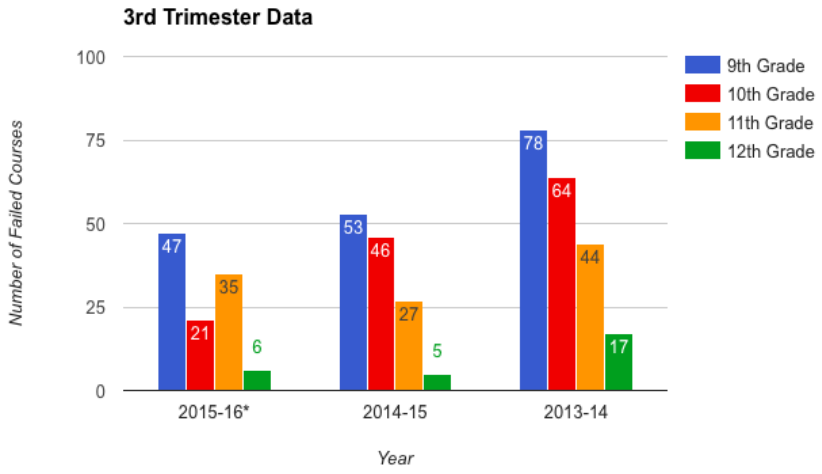

Figure 3: The number of failed courses was collected by grade level and arranged by year during the 3rd trimester over the past three school years.
*Indicates that 2015-16 school year was the only year in this range to have MTSS.

Apples to Apples

The apples to apples portion of the results uses the same data that was presented visually in the previous section (Three-Year Span). However, specific differences can be analyzed better when placed into a table setting than in a visual environment. The snapshot comparison of classes from year-to-year serves as a valuable tool to see the impact that MTSS had after full application. Three tables will be referenced in this results section including first trimester data (Table 1), second trimester (Table 2), and third trimester (Table 3). When looking at the first year of MTSS implementation, great reductions in failing courses were found. In Table 1, each of the grade levels saw a reduction in number of failed courses with a 9-12 total of 55 courses. In Table 2, year one of implementation saw a 9-12 total reduction of 43 courses, while year two of action saw another reduction of 40 courses. Table 3 focused on the third trimester, and while the eleventh and twelfth grade saw modest increases in failed courses when compared to the previous year, grades 9-12 collectively saw improvement with a reduction of 22 courses.

In total, 120 failed grades were reduced from the previous year at the same time during the first year of MTSS. The year one differences from Table 1, Table 2, and Table 3 were added to obtain this cumulative number.

Table 1

Number of Failed Courses during the First Trimester

1st Trimester	Number of Failed Courses					Difference	
Class of	Class of	14-15	15-16	16-17*		Year 1	
2020	9th Grade	56	45	15		30	
2019	10th Grade	60	28	27		1	
2018	11th Grade	32	31	22		9	
2017	12th Grade	13	23	8		15	
					Total	55	

Table 1 shows the number of failed courses during the first trimester over a three-year window. The 2016-17 school year is highlighted yellow to signify that MTSS was in full implementation during that time period. The year 1 differences were calculated by taking the difference in failed courses from the 2015-16 school year and the 2016-17 school year. Positive values indicate a reduction in failed courses after implementation of MTSS.

Table 2

Number of Failed Courses during the Second Trimester

2nd Trimester	Number of Failed Courses					Difference	
Class of	Class of	14-15	15-16*	16-17*		Year 1	Year 2
2020	9th Grade	64	50	16		14	34
2019	10th Grade	62	38	40		24	-2
2018	11th Grade	28	28	22		0	6
2017	12th Grade	12	7	5		5	2
					Total	43	40

Table 2 shows the number of failed courses during the second trimester over a three-year window. During this window of time, only the 2014-15 school year was without MTSS. The year one difference was calculated as the difference in failed courses from the 2014-15 school year to the 2015-16 school year. Year two differences were calculated as the difference in failed courses from 2015-16 to 2016-17 school years. Positive values indicate a reduction in failed courses over time.

Table 3

Number of Failed Courses during the Third Trimester

3rd Trimester	Number of Failed Courses					Difference	
Class of	Class of	13-14	14-15	15-16*		Year 1	
2020	9th Grade	78	53	47		6	
2019	10th Grade	64	46	21		25	
2018	11th Grade	44	27	35		-8	
2017	12th Grade	17	5	6		-1	
					Total	22	

Table 3 shows the number of failed courses during the third trimester over a period of three consecutive school years. The 2015-16 school year was the only year to have MTSS is place. The year one-difference calculation was calculated as the difference in failed courses from the 2014-15 school year to the 2015-16 school year. Positive values indicate a reduction in failed courses over time.

Apples to Oranges

The apples to oranges portion of the results has been organized and arranged to look at longitudinal trends in classes as they progress through high school. The tables referenced in this section will also list the number of students who have earned at least one

failing grade and track this from year to year as well. Each individual trimester of MTSS has been arranged in a table below and is compared to the previous year during the same trimester for cohesion of analysis. Four trimesters of MTSS practice have occurred at Oskaloosa and are represented in Tables 4-7. The tables below are not placed in chronological order, but rather by trimester.

A remarkable trend emerges throughout each of the four trimesters of implementation. Not only does each individual trimester reduce the number of failed courses when compared to the previous year, but the number of students earning at least one failing grade is reduced as students' progress through high school as well.

Table 4

First Trimester Differences after Year One of MTSS Implementation

1st Trimester							
	2015-16 NO MTSS		2016-17 MTSS			Year 1 Difference	
Grade	# of Students That Failed a Class	# of Failed Grades	# of Students That Failed a Class	# of Failed Grades	Current Grade	Decrease In Students That Failed a Class	Decrease In Failed Grades
9	33	45	11	15			
10	17	28	18	27	10	15	18
11	18	31	14	22	11	3	6
12	14	23	4	8	12	14	23
TOTAL	82	127	47	72	Total	35	55

Table 4 tracks the number of students receiving at least one failing grade and number of failed courses from the first trimester of the 2015-16 school year with no MTSS to 2016-17 school year with MTSS. Coloration is shown to assist with grade progression. Differences in the number of failing students and failing grades are presented in the right-hand portion of the table. Positive values indicate a reduction in failed classes/grades.

Table 5

Second Trimester Differences after Year One of MTSS Implementation

2nd Trimester							
	2014-15 NO MTSS		2015-16 MTSS			Year 1 Difference	
Grade	# of Students That Failed a Class	# of Failed Grades	# of Students That Failed a Class	# of Failed Grades	Current Grade	Decrease In Students That Failed a Class	Decrease In Failed Grades
9	23	64	28	50			
10	24	62	19	38	10	4	26
11	17	28	18	28	11	6	34
12	5	12	3	7	12	14	21
TOTAL	69	166	68	123	Total	1	43

Table 5 tracks the number of students receiving at least one failing grade and number of failed courses from the second trimester of the 2014-15 school year with no MTSS to 2015-16 school year with MTSS. Coloration is shown to assist with grade progression. Differences in the number of failing students and failing grades are presented in the right-hand side of the table. Positive values indicate a reduction in failed courses/grades.

Table 6

Second Trimester Differences after Year Two of MTSS Implementation

2nd Trimester							
	2015-16 MTSS		2016-17 MTSS			Year 2 Difference	
Grade	# of Students That Failed a Class	# of Failed Grades	# of Students That Failed a Class	# of Failed Grades	Current Grade	Decrease In Students That Failed a Class	Decrease In Failed Grades
9	28	50	12	16			
10	19	38	18	40	10	10	10
11	18	28	17	22	11	2	16
12	3	7	3	5	12	15	23
TOTAL	68	123	50	83	Total	18	40

Table 6 tracks the number of students receiving at least one failing grade and number of failed courses from the second trimester of the 2015-16 school year with MTSS to 2016-17 school year with MTSS. Coloration is shown to assist with grade progression. Differences

in the number of failing students and failing grades are presented in the right-hand side of the table. Positive values indicate a reduction in failed courses/grades.

Table 7

Third Trimester Differences after Year One of MTSS Implementation

3rd Trimester							
	2014-15 NO MTSS		2015-16 MTSS			Year 1 Difference	
Grade	# of Students That Failed a Class	# of Failed Grades	# of Students That Failed a Class	# of Failed Grades	Current Grade	Decrease In Students That Failed a Class	Decrease In Failed Grades
9	31	53	29	47			
10	23	46	11	21	10	20	32
11	18	27	19	35	11	4	11
12	3	5	4	6	12	14	21
TOTAL	75	131	63	109	Total	12	22

Table 7 tracks the number of students receiving at least one failing grade and number of failed courses from the third trimester of the 2014-15 school year with no MTSS to 2015-16 school year with MTSS. Coloration is shown to assist with grade progression. Differences in the number of failing students and failing grades are presented in the right-hand side of the table. Positive values indicate a reduction in failed courses/grades.

Discussion

In general, the results of this study have shown an overwhelmingly positive effect of the implementation of MTSS at Oskaloosa High School. However, a yellow flag becomes apparent during the third trimester of the 15-16 school year when the eleventh and twelfth grade had a modest collective increase of nine failed courses (Table 3) when compared to the previous year, even after implementation of MTSS. However, when that data (failed courses in the eleventh and twelfth grade) from the 2015-2016 school year was analyzed in comparison to the previous year (failed courses in the tenth and eleventh grade) in the apples to orange results (Table 7), the students saw a reduction of 11 failed courses in the

eleventh grade and reduction of 21 failed courses in the twelfth grade in the 2015-2016 school year. The importance of considering the results of this method of analysis is to recognize that it follows a group of students as they progress throughout school, which some researchers consider to be a more accurate study analysis, as lack of skills are typically an indicator of predicted performance in the classroom specific to that class itself, rather than comparing to different classes of previous years. However, both the snapshot view (apples to apples) and longitudinal view (apples to oranges) have value in data analysis.

The enactment of MTSS has made a large impact on Oskaloosa High School. No matter how the data is analyzed, whether it be a yearly snapshot in comparison to previous years or a longitudinal study looking at transformations from year to year, the data shows a significant reduction in not only failing courses, but also students receiving a failing grade. In the apples to apples portion of the results (Tables 1-3), each and every trimester when compared the previous year at the same time proved successful by reducing the number of failed courses. On average, each trimester of MTSS has shown a reduction of 40 failed courses. In the apples to oranges comparison, when classes were analyzed longitudinally over their time, the data also showed a significant impact. Over the course of the same four trimesters of implementation when compared to the following year of the class study, an average of 17 students transitioned from struggling students to proficiency.

Future Direction

The implementation of MTSS at Oskaloosa High School has been successful and will continue to be utilized in the coming school years. Teams of teachers within the school will frequently evaluate the evidence and look for ways to continually improve the effectiveness

of the program. Future studies on the impact of MTSS could include evaluation of the ways in which the program could be used for extension and enrichment opportunities for unchallenged students wishing to learn at a deeper level or a faster pace.

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