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## MITEP: REFLECTIVE JOURNEY

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MITEP: REFLECTIVE JOURNEY

By

Jennifer N. Finta

A REPORT

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

In Applied Science Education

MICHIGAN TECHNOLOGICAL UNIVERSITY

2014

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This report has been approved in partial fulfillment of the requirements for the  
Degree of MASTER OF SCIENCE in Applied Science Education

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### **Abstract:**

This research looks at the use of the Interactive Student Notebook (ISN) in the math classroom and the impact on student achievement as part of the MiTEP program. A reflective critical analysis of the MiTEP program discusses impact on teacher pedagogy, leadership, and connections to people and resources.

The purpose of the study stemmed from the lack of student retention, poor organizational skills, and the students' inability to demonstrate college readiness skills such as how to study, completing homework, and thinking independently. Motivation also stemmed from teacher frustration.

The research was conducted at Linden Grove Middle School in Kalamazoo Michigan in a strategic math class. Twenty-two sixth graders, thirty-two seventh graders, and forty eighth graders were part of the study. Students were given the Strategic Math Inventory (SMI) test in week 1 of the class and again at the end of a 12 week marking period. Students participated in an attitude survey to record their feelings about the use of the ISN in the strategic math classroom.

The data compared the control group (the previous year's [2012-2013] growth data) to the experimental group, the current year's (2013-2014) growth data. Both groups were statistically similar in that the mean average was about a 4<sup>th</sup> grade level equivalency and the groups had similar numbers of grade level students.

The significant findings were in the amount of growth made using the ISN. The control group started with a mean average of 586.6 and ended with a mean average of 697.1, making about one year's growth from a 4<sup>th</sup> to a 5<sup>th</sup> grade level equivalency.

The experimental group started with a mean average of 585.2 and ended with a mean average of 744.2, making about two years growth from a 4<sup>th</sup> to a 6<sup>th</sup> grade level equivalency. This is double the growth of the control group.

The Cohen's test resulted in a score of 0.311 which describes that the teaching method, the use of the ISN in the math classroom had a medium impact on student growth.

## **Reflection of Impact of Interactive Student Notebooks**

A colleague and I completed action research on the use of Interactive Student Notebooks in the math classroom. My colleague teaches strategic math and I teach 6<sup>th</sup> grade math. Several frustrations led to this collaboration, primarily lack of student organization, retention, and demonstration of college readiness skills. As teachers, the frustration we shared was trying to understand a way to help our students see the whole picture: how topics are connected, and how strategic math supports the standard math classroom. Together we discussed the use of the Interactive Student Notebook (ISN) to address these issues. We collaborated weekly on implementation, reflection on success or the lack of success with specific assignments, and research. We modified our implementation based on what we were learning and our student's needs

Strategic math uses an online program to assess student growth through the course. We decided to use this data to determine our overall impact on student learning with the use of the ISN, as it was part of the curriculum and easy to collect. Furthermore, we had 3 previous years of data to compare to. We looked at pre scores and compared them to post scores with the implementation of the ISN and compared to the 3 previous years before the implementation of the ISN.

Through the collaboration we were able to have a positive impact on student learning and achievement. Collaborating allowed us to perfect the use of the ISN more quickly than had we worked independently of one another. We

could share the workload and the strategies used to provide a faster turnaround time and a quicker learning curve. We were able to collaborate and address similar content, allowing students to see the connections between the two math classrooms.

## Chapter 1

### Interactive Notebooks in the Math Classroom

#### ***Motivation for the Study***

The motivation for this study stemmed from the lack of student retention, poor organizational skills, and the students' inability to demonstrate college readiness skills such as how to study, completing homework, and thinking independently. Motivation also stemmed from teacher frustration – students were being taught topic after topic, but in the long term, they didn't see the big picture over the course of the unit, or the course of the school year, which made it impossible for them to remember topics that had been taught early in the school year.

Interactive Student Notebooks (ISNs) seemed to be one thing that may solve all of these frustrations.

Interactive Student Notebooks are instructional tools which are used by teachers to provide students a means of organization for notes, independent work samples, collaborative and whole class work, graphic organizers, writing samples, and other evidence of their continued learning. In classrooms where ISNs are used, students were encouraged and expected to use them as a source for reference, and a place to store documentation for any activity which adds to the learning they do on a daily basis. Because so many different pieces of instruction combine to create the whole, the ISN becomes a student's own portfolio of learning. Having the record of the entire year of learning enables the student to revisit prior topics in such a way that it can propel them forward into

new learning, and allows the student to gain a vision of the “bigger picture” of their own learning. Additionally, because educational research shows that students need to revisit new topics several times before it becomes a part of the long term memory, ISNs are an excellent study tool, and an aid to boost student retention.

This study may be of interest to other professionals in the educational field. All students can benefit from an organizational tool. All students can benefit from a long-term study guide. All students can benefit from a portfolio of their own work. Additionally, college readiness is the goal for most middle schools and high schools, and the ISN provides a means of organization that students can easily carry through to their college courses. No matter the content area, Interactive Student Notebooks could be used in any classroom, so any teacher, principal, or tutor may be interested in the results of this study.

### ***Research Question***

The question that drove this study was “*How can student performance be improved?*” Simply put, how can teachers help consistently underperforming middle school math students improve mathematical performance over the middle school time frame, and help them to be better prepared for high school and college? The goal was to find a way for students to maintain a high level of performance on skills that were taught over a span of time.



### ***Readings About the Study***

The sources of reading that fueled curiosity with the research team came from Teachers Curriculum Institute, a publishing company that supports the use of ISNs. After looking at the TCI website and the ideas that were presented there, the research team grasped onto three statements regarding the use of ISNs, sparking further interest to conduct this study. The key points to the article included the arguments for why a teacher should use interactive notebooks. TCI stated that Interactive Student Notebook (ISN's) would help students see the "coherent whole," help students "organize systemically as they learn," and provide a "portfolio of individual learning."

Additionally, the research team had a positive feeling about ISNs after seeing them in use in another classroom. However, that was a social studies classroom, which is the market for TCI. The team was unclear as to whether they would have the same kind of impact in a math classroom, and could not find any data that supported this. The research team also wondered if there were any specific methods for initiating the class in the use of ISNs, and whether or not more teachers would be able to share about positive results in an urban setting, specifically in a math classroom, or a classroom for underachieving students. In an attempt to answer these questions, both researchers continued to interview teachers currently using ISNs, as well as probing further using publications from TCI.

With the lack of information available for use of ISNs in the math classrooms, it was important to the team that frequent meetings be scheduled to debrief and

reevaluate the implementation strategy. The team continued to share what was working well and what problems arose, using that information to refine the implementation process. Some things shared included note-taking with colored pencils as a way for students to further break down the information, time management concerns for putting student work into the notebook, tips for organizing the notebooks into sections (i.e. table of contents at the front and glossary at the back), documentation of collaborative work for each partner, etc.

### ***Research Plan for the Study***

The study was conducted at Linden Grove Middle School in Kalamazoo Public Schools, an urban district heavily populated by at-risk youth, in a 6<sup>th</sup>-8<sup>th</sup> grade Strategic Math classroom. Strategic Math is an intervention class targeting underperforming students. Data was collected over the course of two school years (2012-2013 and 2013-2014). In both years, one sixth grade class, two seventh grade classes, and two eighth grade classes were involved in the study. The classes involved in the research were statistically similar; only those students who were 2 or more grade levels behind as shown on two standardized assessments were enrolled in the course. Additionally, the course was limited to a cap of 20-25 students, so class sizes remain small for the purposes of the intervention. In the 2012-2013 control group, 68 students completed the testing for data collection (Table 1). In 2013-2014 experimental group, 94 students completed the testing for data collection, as outlined below. Data was collected for the control group to assess the gains made when no change was made to instruction. Data was collected for the experimental group to assess the gains

Table 1.

Control Group	Date Given	Number of students	Teacher
Pre-test	September 2012	Grade 6: 14 Grade 7: 30 Grade 8: 24 Total: 68	Angela Ernstes
Post-test	November 2012	Grade 6: 14 Grade 7: 30 Grade 8: 24 Total: 68	Angela Ernstes
	Date Given	Number of students	Teacher
Pre-test	September 2013	Grade 6: 22 Grade 7: 32 Grade 8: 40 Total: 94	Angela Ernstes
Post-test	November 2013	Grade 6: 22 Grade 7: 32 Grade 8: 40 Total: 94	Angela Ernstes

made when a change was made to instruction; in this case the change made was the implementation of the ISN.

The data collected was the growth in Scholastic Math Inventory scores (SMI) from the beginning of the year through the first trimester (12 weeks) of the school year. The Scholastic Math Inventory test is a research-based and student adaptive assessment, with two major components. The first component of the test was a facts fluency measurement; this data was not collected for this study. The second component of the test was a performance test comprised of a series of multiple choice questions intended to identify the mathematical skills a student can or cannot perform, from which a score called a Quantile measure was assigned. This data was collected.

According to *The Quantile Framework for Mathematics: A System for Measuring Student Mathematical Understanding and Task Difficulty*, the Quantile Framework is a developmental scale on which students' readiness for mathematics instruction, the difficulty of mathematics concepts and skills, and instructional materials for teaching mathematics are measured." In short, the Quantile score is a measurement of a student's readiness for instruction and ability to perform skills on the Quantile Framework, as determined by performance on the SMI test. As a student progressed through the SMI test, they were given questions with increasing difficulty. As skills were performed correctly, the student's point total increased; similarly as students could not perform a skill the score decreased. On the Quantile Framework, each tested skill is labeled with a QTaxon, and associated with a Quantile measure. The

Quantile measures are carefully calibrated to national mathematics standards by subject matter experts. The Quantile measures of questions are used to help calculate the final Quantile score upon completion of the test. The SMI item bank of over 5,000 questions spanned broad mathematical categories, including Number and Operations (with Whole Numbers, Fractions, and Decimals), Data Analysis, Probability and Statistics, Algebra, Geometry, and Measurement. Data is reported using Common Core State Standards as a reference for the Quantile measure, and the comparison of student performance to those standards. A table identifying the breakdown of Quantile scores and grade level proficiency, found in The Quantile Framework for Mathematics, is included in Appendix I.

The description below is an example of how a Quantile score could be calculated for a student: If a student could perform a skill, such as addition/subtraction with fractions, the student was given a similar question at a higher level, like adding/subtracting mixed numbers. The student would then be questioned on a more difficult skill, such as multiplying fractions, and so on, until they are no longer able to answer questions correctly. This process is repeated in each of the broad mathematical categories. Each time a student demonstrated mastery of a skill, the student was further questioned until they reached the level at which they could no longer answer questions correctly.

Students in both the control group and the experimental group were provided instruction centered on the America's Choice Math Navigator intervention series. Math Navigator is research-based program aimed at identifying and correcting misconceptions in previous mathematical learning. It had been in use in

Kalamazoo Public Schools' Strategic Math courses since the 2011-2012 school year. Students complete three modules of the Math Navigator program per year, one module per trimester. Students in 2012-2013 were provided with folders in which they could store their work for Math Navigator. It was only expected that students store work for the current module in which they were working. Students in 2013-2014 were provided the 3-subject spiral notebooks used to build the ISN and store materials for each module for the course of the entire school year.

The data analyzed included the SMI growth made during 2012-2013 school year (trimester one) before the implementation the ISN (control) compared to the SMI growth made during the 2013-2014 school year (trimester one) after the implementation of the ISN (experimental). To summarize, the students were assigned a numerical value to interpret the range of their performance on the SMI Quantile Framework. The scoring range is used to reference the Quantile Framework and identify an optimal range of instructional topics. In Kalamazoo Public Schools, students must fall into the "proficient" category in order to exit the Strategic Math intervention, and that becomes the end of year goal for every student. Proficiency ranges for the middle grades are as follows: 6<sup>th</sup> grade students must reach 780Q, 7<sup>th</sup> grade students must reach 890Q, and 8<sup>th</sup> grade students must reach 1030Q (signifying the student has the necessary skills for Algebra readiness) by the year's end.

### ***Analysis and Interpretation***

The research team discovered the following:

In 2012-2013, the mean initial SMI score was 586.6, with a standard deviation of 136.9. This indicated that students were entering the class at about a 4<sup>th</sup> grade performance level, give or take one grade level. At the end of trimester one, the mean score was 697.1 with a standard deviation of 153.4. That amounted to a mean growth of 110.5 points within the twelve week time frame. That meant that by the twelfth week of school, the average performance level of the students in Strategic Math had increased to 5<sup>th</sup> grade proficiency level, give or take one year.

In 2013-2014, the mean initial score was 585.2, with a standard deviation of 143.7. These initial values were statistically comparable to the initial average in 2012-2013, with students entering class again at an average 4<sup>th</sup> grade performance level, give or take one year. At the end of trimester one, the mean score was 744.2, with a standard deviation of 156.2. That amounted to a mean growth of 159.0 points within the twelve week time frame. That meant that by the twelfth week of school, the average performance level of the students in Strategic Math had increased to 5<sup>th</sup> grade level, give or take one year, and had nearly reached the 6<sup>th</sup> grade performance level.

To make a comparison between the control group and the experimental group, we looked at mean growth for each year. Based on the comparison it was evident that the experimental group had made more gains as their growth went up an additional grade level compared to the control group. The research team wanted to further understand if this growth was significant.

Using the Cohen's formula to determine the "effect size," or magnitude of growth, a score of .311 indicated that the growth fell into the category of "medium." The classroom teaching had a "medium" effect on student growth from the control group to the experimental group. Overall, this was important to note, because the improvement of gains was attributed to the use of ISNs in the classroom. The data supported the statement that ISNs had been an effective aid to student learning.

### ***Attitude Survey***

In addition to collection of growth data, students participated in an attitude survey, which the research team used to determine the opinions of the students in regards to the ISN. Five questions were asked; these questions were closely related to the research question, as well as the claims from TCI. Surveys were conducted anonymously, and students rated on a scale of 1-5 as outlined below. In the classroom, the ISN is called the "Active Book," as identified in the survey.

Mark whether you strongly disagree (1), disagree (2), neutral (3), agree (4), or strongly agree (5) with each statement given below.

- Using Active Books in Strategic Math has helped me to stay more organized
- Using Active Books in Strategic Math has helped me stay caught up on work.
- Using Active Books in Strategic Math has helped me see what I was learning from start to finish.



- Using Active Books in Strategic Math has helped me know what I should study.
- My Active Book will be a good study tool for the ENTIRE school year.

The results of the student surveys are shown in Table 2, with percent of respondents included in parenthesis:

Table 2

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	3 (5.0%)	1 (1.7%)	12 (20.0%)	17 (28.3%)	27 (45.0%)
2	1 (1.7%)	4 (6.7%)	10 (16.7%)	28 (46.7%)	17 (28.3%)
3	3 (5.0%)	4 (6.7%)	10 (16.7%)	24 (40.0%)	19 (31.7%)
4	1 (1.7%)	3 (5.0%)	14 (23.3%)	18 (30.0%)	24 (40.0%)
5	1 (1.7%)	2 (3.3%)	11 (18.3%)	19 (31.7%)	27 (45.0%)

When surveyed regarding the use of ISNs, the vast majority, 70-76%, of students agreed and strongly agreed with the five above statements. In fact, 40-45% of students *strongly* agree that active books help them stay organized, help them know what to study, and will be a good study tool for the entire year. The number of students who agree or strongly agree with the statements made in the survey are markedly higher than the number of those who did not. This data further supported the use in the classroom, and further confirmed the claims made by TCI that the ISN would help students see the “coherent whole,” help students “organize systemically as they learn,” and provide a “portfolio of individual learning.”

It should be noted that fewer students participated in the attitude survey than those who participated in the SMI test either due to absence from school or because students had exited the course.

### ***Conclusion***

The research team plans to continue the research, following the analysis outlined above, for the remainder of the school year. Data will be collected at the end of trimester two, as well as the end of the school year. Again, the comparison will be made between last year (without ISN) to this year (with ISN). It will be valuable to see if the growth is markedly higher for trimester two and three, as it was in trimester one.

As a result of this study, the research team believes that the implementation of the ISN was successful, and that it had a positive impact on student performance. This was demonstrated by an overall increase in student growth, and a medium effect size based on the Cohen's formula. Because the system of the ISN is easily reproduced by a student, it should also have a positive impact on college readiness and organization.

The team felt that ISNs were a useful tool in the instructional process, mainly because students had in their possession a resource to help them answer any question that was asked in the classroom, and a system for organizing their own work. The ISNs facilitated the use of tools/resources that had been provided to students because they could be easily located in the ISN, as opposed to being stored in separate folders or binders with papers from other courses. There was a stronger ability to make connections from one topic of learning to another. It was important throughout the process that the students become involved in assembling their own classroom tool and portfolio of student learning, and the team learned that when students became involved in that process there was a stronger ability for them to independently investigate for answers to the questions being asked on a day to day basis in class.

Both researchers felt that while they had implemented the Interactive Student Notebooks with fidelity, the need for further professional development still remained. The next important step is to share this information with colleagues, so that they may also consider the use of ISNs in their own classroom.

Additionally, the research team will be presenting data to administrators in an effort to secure the necessary funding for professional development sessions on the implementation and use of ISNs in a classroom, as well as the 3-subject notebooks needed for ISNs in the coming school year.

## Chapter 2

### MiTEP Rewound

Continuous educational credits and professional development are required for a teacher to maintain certification in the public education system. Teachers understand this expectation but often find it difficult to find a program that is conducive to their work schedule, relates to what they teach, and is affordable, considering most teachers are paying off their debts from undergraduate school.

In October of 2012 I was a late hire into Kalamazoo Public Schools. One of the first questions I was asked by my department head was if I was working on a master's program. I shared that I was not, but I needed to get started on a program because my certificate was about to expire. I also shared that financially I did not know how I was going to pay for it. My department head responded with "I have just the program for you, and it aligns with what you teach, your schedule, and is highly manageable financially." Knowing this information only I began my journey with MiTEP through Michigan Technological University.

As a new *late* hire in the district I was on a quick learning curve and did not think much about the program I had just enrolled in. I really thought "I am glad I will get my credits completed so I can renew my certificate." When I received an email outlining my summer for the first summer institute I began thinking to myself, just what exactly do I have coming?!?

Many staff members in my building were enrolled in the program as part of cohort 3, and I was watching them collaborate and work together. Through their

conversations and many exchanges about how they had modified a lesson or were using this or that based on an experience from the MiTEP program, I wanted to be a part of the program, too! I then knew I made the right decision. I packed my bags and met a group of people I had never met before at an unreasonable hour of the morning to head to Michigan Technological University!

Immediately we discovered that we had too many people and not enough vehicles, we also had members over a half hour late. My stress was rising as I did not know anyone and my type A personality was struggling with the lack of structure. This theme continued through my first summer and challenged me, pushing me outside my comfort zone. One of the most important things that I learned was that people grow when on the edge of their comfort zone. It is about finding that boundary and carefully balancing it, never swinging too far to the right or left.

I spent much of my first summer adapting to “the situation,” working through frustration, collaborating with others, and relinquishing control. This sounds like a terrible situation, but I realized that this is how many of my students feel as they enter school each and every morning. As teachers we talk about the needs of our students but I did not truly understand what it felt like to really “not get it” day after day.

One of the first mornings we were given global positioning systems and a mini lesson on how to use them; we were sent on our way to find an Earthcache. Finding the cache did not prove as difficult as I had thought, but once we arrived

at the Stromatolites Earthcache I felt very frustrated by the questions that went along with the cache. I could not understand how I “was just supposed to know” how the stromatolites arrived at this location based on looking at it. The worst was that every time I asked for help I was met with a series of questions. Having a question answered with a question was very frustrating! I felt like I was going in circles. After a few mini vent sessions I was able to start thinking – and began to put pieces together. Did I arrive at the perfect answer? No, but did I use problem solving strategies and clues around me, and converse with others to increase my ability to learn and understand? The answer was YES!

The following school year, I returned as a better teacher, loaded with questions and questions about questions. I was not trying to frustrate my students but to challenge them in their learning, and to guide them in their thinking to help them arrive at a conclusion on their own. This did not always go over well and 3 years later I still hit bumps in the road. I have shared my personal experiences with the students and this helped them to see that it was okay to not like the questions, but that it makes them better students and life learners when they learn to think!

In my classroom there has been a large shift from “do this” to “tell me how you arrived at your conclusion.” With increased pressure of standardized testing and teacher evaluation, teachers are being told to transform their classrooms with very little training, time, and guidance about how to “transform the classroom.” After just my first summer I had an improved idea of how to go about doing this. As a math teacher I see students, who have misconceptions.

Students think that there is only one right way to solve a problem; that math is black and white with no gray area. With the questioning skills I gained I was better able to identify and address the misconceptions. If my students were interviewed I think they would say that “Ms. Finta is more concerned with your thinking than if you can get the right answer.” Students may roll their eyes over this, but it affirms what I have learned and put into practice as part of my experience with MiTEP.

Teacher evaluation is scrutinized by administrators, the government, and the community. My personal evaluations have increased in the questioning category. My principal commented that “it happens so naturally, and it just makes sense to the students.” My principal has also asked me to coach new teachers and for them to observe my questioning in the classroom setting.

Secondly, I have gained immense leadership skills as part of the MiTEP program. I am currently in my 7<sup>th</sup> year of teaching and have begun to feel like I have something to share with others. For several years I was in “scrapper mode,” literally begging, borrowing, and stealing ideas from others! I have been able to refine my practice, and beliefs to make them my own (not begged, borrowed, and stolen from someone else!), which is still always changing, growing, and developing, as each school year offers new challenges and experiences. I began to notice the change, though, after my first summer and first completed year of MiTEP.



Lesson Study was one of the best experiences in MiTEP. It proved to be tricky, logistically, as I partnered with a middle school science teacher from a different building and a former middle school science classroom teacher who had crossed over to an educational farm specialist in earth science and agriculture! The opportunity to work with each other, as specialists in our content area, does not often occur. Lesson study afforded us the opportunity to work together by observing one another and providing critical analysis based on our observations to create a deep and meaningful lesson.

My role as a dual certification teacher, certified to teach both math and science, lends nicely to the years when our enrollment allows me to teach sections of both math and science. This particular year I had one 6<sup>th</sup> grade science class beginning a unit on rocks and fossils. This specific unit is not always the most engaging to inner city students, as they have little experience y with rocks in natural settings.

When we three educators got together we were thinking “how and in what way can we address the lack of interaction with nature and make the fossil lesson more engaging for the students?” We were able to write a grant through the connections made at Michigan Technological University and actually received a fossil kit! This was when the iceberg began to shift. My entire department began asking questions about how I was able to get my hands on these resources and how was I able to get “extra adult bodies” in my classroom?!? I shared how we had participated in a lesson study and the lesson evolved as we observed each other teaching it. The engagement of students increased each

time and by the third time the lesson was taught we even had two students that never participate interested! Our management improved and the negative behavior had turned to positive behaviors! Without even planning or realizing it, I was leading my department in a mini version of lesson study.

Teachers began to observe each other on their prep hours and engage in conversation about what they saw. As my department liked what they began to see, we had more support to advocate for leave time to observe others. I would not have had this opportunity or taken on a leadership role without the support of the MiTEP program.

Last year I advocated for 6<sup>th</sup> grade teachers to visit the elementary schools and for 5<sup>th</sup> grade teachers from the elementary schools to visit the middle school. The intent was to help see the expectations in both environments in order to better help our student's transition from the elementary to the middle school. One of the 5<sup>th</sup> grade elementary teachers has been teaching for 25 years and has never had the experience of observing outside of her classroom! She said that it was awesome and she wishes that they had only done this sooner! After the visit we met and discussed several things that we could do to help our student's transition. Now that we have been in school over a month this school year I have really seen that our students are better prepared as a whole, in terms of middle school expectations! Truly leadership skills that I learned from MiTEP are making a positive impact for students and staff!

Leadership skills have also played an important role in my experiences with action research, presenting and sharing my own research at the MSTA conference. Another teacher in the district, who teaches strategic middle school math, and I paired to study the impact that interactive student notebooks (ISN's) have on student learning and achievement. A year ago we knew very little and our colleagues knew nothing of ISN's. Together we researched, implemented, regularly discussed what we saw, cried out of frustration, and grew in our practice. We were proud to see that the ISN's had a medium to high impact on our students learning and achievement. From here we took flight and had the evidence to back it up. The best part was that it was our own work and drove our passion of teaching even further. Together we presented our findings at the MSTA conference and networked with other professionals in the state who had experience to share about using the ISN.

It is no secret in my building and district that I work in a "failing school." Several people have left, as the work is hard, but it is most definitely rewarding. My new confidence, connections, and leadership skills have helped create so much passion for what I do that others see it radiate in my work, student attitudes, and work ethic. Recently, a colleague sent me a quote, "A great leader's courage to fulfill his vision comes from his passion not his position." It has been more than humbling that I have been able to help others grow in their practice not because of my position but the passion that I have to make a difference. In most cases I have not pushed or pulled but led by example and naturally people have become interested. That is the root of teaching--to interest

and inspire others to become more and do more, ultimately impacting student growth, which is the goal of standardized testing.

I have advocated at the district level to receive further training to enhance use of the ISN. Since enrolling in the MiTEP program I have transferred to another middle school in the district and have been teaching math. On my 6<sup>th</sup> grade team all of my colleagues are using ISN's in science, social studies, and Language Arts. Most of my math department has also bought into the idea, and at the end of the month I am putting on a staff professional development day for the entire staff because interest has peaked so much about the implementation of the ISN! I have heard repeatedly this school year that my students are finding math so much easier. This past week we were reviewing and I witnessed with my own eyes several students using their ISN to help them study, truly a teachers dream!

My questioning skills, leadership, and advocacy are an accumulation of my years and experiences in MiTEP. Most recently I was asked at the district level to attend administration training because I have displayed qualities of leadership and advocacy. When I reflect back 3 years it is amazing to see my own growth starting small from building leadership, district leadership, state leadership, innovation, failures and triumphs. These successes are because of one small seed planted by another individual involved in the MiTEP program.

I wish that I could say that the entire program was amazing and that I loved every minute of it, but the truth is I did not. Such is all things in life. We

take the good with the bad and the bad with the good. The final stretch of the program was this past summer with a trip to Utah's National Parks and my internship at Pictured Rocks National Lake Shore.

Utah was one of the most challenging 3 weeks of my life. From sleeping in a tent, to no showering, sweating and freezing in the same day, and not enough sleep I was tested! It was an experience I am glad I had as I look back, but at the time I thought if I can just make it home alive.....

I learned about earth science, people, and community, and, most importantly, the difference that a supporting community can make in an experience. The people made this trip for me, not the sights or what we did, but how we banded together and made sure to take care of one another and pick each other up along the way. This is the type of community that I am focusing on this year in my classroom--creating a family and an environment that kids want to be a part of, feel safe in, and trust that when they fall down someone will help pick them up, instead of laughing and bullying. I have more students coming to eat lunch in my room this year than ever, and even previous students want to come back and eat lunch. A natural mentoring program has started, not because I have designed it, but because students want to help each other. They feel safe and better when they help others achieve. My goal is that this evidence of community increases student learning and encourages other teachers to take steps to build this culture in their classrooms.

“We save the best for last” is a common saying and in this case it was true. I had the best 3 weeks living in Munising, Michigan, with 3 other MiTEP participants at Pictured Rocks National Lakeshore. I have lived in Michigan my whole life and have traveled over the entire state several times, somehow always missing Pictured Rocks. Mackinac Island has always been my favorite, but now it is Pictured Rocks National Lakeshore! Honestly, this has been the least impactful MiTEP experience in my classroom, but it is the most impactful educational experience for me about my community and state. I had literally no idea the amount of erosion and how quickly this beautiful landscape is withering away. I learned incredible amounts about the law and conservation practices that are being put into place. I understand why the community has not always been in support of The National Park Service, as they are losing their land, and how NPS is trying to change that relationship by educating the local community.

I felt empowered to share what I have learned to help educate people, which, in turn, help them make better informed decisions. I hope that it encourages more people to vote when decisions need to be made. Through sharing my experience and what I have learned at Pictured Rocks with others, they have become more aware of their environment and what is happening in their state and local communities. Education is not limited to just a school or classroom but reaches into the community, state, and beyond, the power of conversation and sharing with others helps increase awareness and generates further interest in these topics.. My experience has piqued interest in others to

visit the park and vacation in the area, which also directly impacts the local economy.

On a local level in Kalamazoo I have shared my summer travels with staff, students, and families, encouraging them to visit the Upper Peninsula and to get out in nature to enjoy the beauty and the educational value present. One theme that has been present through the entire experience is the connections that have been made with other people and the relationships that will always be present on personal and professional levels. My ability to network in my district makes me a better teacher; as I share and reflect on ideas and practices with other colleagues, I have gained increased exposure to others and to resources that are valuable. I am more aware of educational practice, local and state level environmental issues, and current pedagogy and science as I stay connected with the academic world.

As teachers face many demands in their profession, I have been very fortunate to have been a part of a program that aligned with my schedule, what I teach, and the affordability that MiTEP has provided. The pedagogy, leadership, and connections I have made are immeasurable and are valued. My reflections in this paper did not openly address the topic of increased content knowledge in the field of science but focused more on the practice of teaching. It would also be fair to say that I have deepened my content knowledge as well through the MiTEP experience adding to my practice. Finally, a very warm thank you to those who have played a part in organizing this program helping me grow, in turn helping others to reach their maximum potential.





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## Appendix I

### SMI Performance Standards

Grade	Below Basic	Basic	Proficient	Advanced
2	at or Below 100Q	105Q to 215Q	220Q to 420Q	at or above 425Q
3	at or Below 215Q	220Q to 395Q	400Q to 520Q	at or above 525Q
4	at or Below 350Q	355Q to 465Q	470Q to 720Q	at or above 725Q
5	at or Below 550Q	555Q to 675Q	680Q to 820Q	at or above 825Q
6	at or Below 640Q	645Q to 775Q	780Q to 950Q	at or above 955Q
7	at or Below 700Q	705Q to 885Q	890Q to 1040Q	at or above 1045Q
8	at or Below 800Q	805Q to 1025Q	1030Q to 1140Q	at or above 1145Q