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Finding the Balance with Student Assessments

An Action Research Report
By Zachary A. Calcutt and Crystal L. Helms

Finding the Balance with Student Assessments

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in fulfillment of final requirements for the MAED degree
St. Catherine University
St. Paul, Minnesota

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Date: _____

Abstract

The intent of this research was to create more authentic Montessori-based assessments for third grade math that aligned to the South Carolina State Standards and to meet the needs of data collection for our school and district. The research study took place in two lower elementary Montessori classrooms within a public Montessori school setting. Combined there were seventeen eight to nine year olds, with five males and twelve females. Each child came from different socioeconomic status and from diverse racial backgrounds, including African American, Caucasian, and East Indian. The five sources of data collection used in this research included: math portfolio, student feedback, parent feedback, colleague feedback, and a checklist of Common Core State Standards (CCSS) and materials. The results showed that students were able to better demonstrate mastery of CCSS through Montessori materials in comparison to district provided assessments. In conclusion, it is better to assess students on an individual, developmentally appropriate level and not just a summative assessment.

Authentic Assessments

Throughout the day a child completes many tasks while in the classroom. Teachers work diligently to provide new information for each child to learn and understand. Montessori teachers are trained to monitor students and their learning styles, progress, and report mastery of skills. In the public school setting, the Montessori teacher, often called the guide, is required to do all of the above, as well as report mastery of state standards through the use of district required assessments, and standardized tests mandated by the state. The Montessori guide knows that the child must master a certain material and concept before moving on to the next level of mastery. When looking closely at what the guide is observing, they are seeking the quality of learning and not the quantity. In the public school system, quantity (including data collection) is followed for progression of standards instead of following the child, a Montessori concept. Districts provide each grade level a scope and sequence that is followed rigidly and a strict timeline with assessment of standards. However, the Montessori progression does not align with the Common Core State Standards (CCSS) that are found in today's classroom. This causes a struggle to balance skill mastery and data collection analysis to meet the needs of individual students rather than a general assessment.

The Montessori guide is looking to further help the child to new levels of mastery through exploration, understanding, and purposeful play. The guide works to observe and follow the child, which is often lost in the timelines that are set at a state or local school level. The Montessori classroom promotes the mastery of standards, Montessori skills, and exploration that each child masters at their own pace. Ideally, the child would be assessed through authentic assessments rather than district assessments, standardized testing, and memorization. The children would show their mastery of the materials

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through portfolios and self-checklists, and their learning should follow their passions and interests. The authenticity of the Montessori Method is lost due to the Common Core State Standards (CCSS), state, district, and school requirements. Therefore, we are researching the question to what extent can teachers using a checklist aligned to Common Core math standards use Montessori-based math activities to gain a clear and accurate understanding of student progress on state math standards?

As Montessori teachers teaching within a traditional school setting, we are looking to further our understanding and better assess our students through authentic assessments rather than district standardized assessments. Our school uses district provided assessments for Math, English Language Arts, Science, and History. Our students test scores are used in comparison to other children in the school and district. Because our students are taught using Montessori methods, and are unfamiliar with the paper and pencil type drills duplicated in the district-assessments, we believe they score more poorly than is merited by their understanding.

We are assessing through more accurate Montessori-based assessments for third grade math. We will use our research to meet the needs of data collection for our school and district as well as proving the mastery of skills according the South Carolina State Standards in math.

Our research was conducted in two separate classrooms with a balance of student populations. Research participants included third grade students ranging from eight to nine years of age, and of African-American, Caucasian, and East Indian ethnicity. Our

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research population consisted of five males and twelve females with a total of seventeen participants. Participants come from various socio-economic backgrounds.

According to our research about assessments with Montessori materials and child-driven outcomes, we gained a better understanding of authentic assessments and how to implement them in the classroom. As teachers, we need to meet the needs of the individual learner and their learning styles while authentically assessing what they have learned.

According to research, assessment is defined as an appraisal, evaluation, or judgment. In the classroom, teachers are able to use assessments to gather information on what their students know, what they want to know, and what they are ready to learn. According to Golich (1998), student assessment is the ongoing process of establishing clear, measurable expected outcomes of student learning; ensuring that students have sufficient opportunities to achieve those outcomes; systematically gathering, analyzing, and interpreting evidence to determine how well student learning matches (school) expectations and using the resulting information to understand and improve student learning. We are researching ways to meet the needs of each student for our school and district, while maintaining the same level of comfort for our students in the classroom in relationship to math assessments.

The following is a literature review on authentic assessments in the classroom, and the importance of accurate assessments in the public Montessori school settings in relationship to district and state requirements.

Research indicates, the current emphasis on standards based education and accountability in public schools have had a major impact on early childhood teachers'

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practices (Madeja, 2004, pg. 3). According to Madeja (2004), the need to meet standards has driven the modern day teacher to teach to meet the needs of the state, district, and school and sometimes forgetting about the individual needs of the child. These “mandatory” standards are creating frustrations with limiting what can be taught. Goldstein (2012) says that it is unrealistic to ask a teacher to stop making decisions about how and what to teach. Intentional decisions about curriculum and instruction are the key responsibilities of a teacher.

As teachers, we are called to meet the needs of each child as an individual. We strive to provide meaningful, engaging learning experiences that support children and what they are learning. The classroom is the place to integrate what the teacher has learned through experiences, knowing their students interests, and in preparation for what is to come next. For example, instead of using a story out of a textbook, the teacher might replace it with one that the child will enjoy more, yet the teacher is still covering the same standards and lessons with the child.

According to research, three traits were common to those teachers who successfully balance “the child and curriculum” (Goldstein and Bauml, 2012, p. 97) in today’s complex public school system. Each trait that was characterized was explored in detail by Goldstein and Bauml (2012). They are as follows:

- Acquire detailed and thorough knowledge of policies and expectations by state, district, and building authorities
- Consideration of required materials as a starting point
- Showcase children’s engagement in substantive learning

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Each child is an individual learning at a different rate. One key component of learning is to assess what you have learned, what you want to learn, and what you are going to learn. One way to assess is through self-assessment. The importance of self-assessment is developing self-regulation, when the child is able to self-educate, self-direct, regulate motivation, and learn to think about what they are doing. Research has found that this in itself is fundamental to academic achievement. (Ervin, Eash, and Mecca, 2010, p. 22). Self-assessments can be used for students to evaluate themselves in journals, projects, and rubrics. This process of self-assessment will take time for the child to be comfortable in the classroom setting which has been carefully prepared by the teacher. Self-reflection allows the children to reflect on their performance, evaluate their progress, and enables them to become more responsible for their learning. The results will be a great sense of ownership by the child.

In a Montessori classroom, students are taught at an individual level through lessons of mastery. Because we are looking at more authentic assessments, literature was taken from the Montessori classroom in relationship to the traditional classroom setting. In the Montessori classroom, each child works independently to understand, develop, explore, and grow. The teacher works as a guide to direct the child in the appropriate direction for learning. In the public school, the teacher is doing the same, but has to meet district and state requirements. These requirements are easily assessed through benchmark tests and standardized testing for data analysis and comparison.

One way that a teacher can show mastery of a standard or material is through daily work samples. Each work sample shows mastery of materials, standards, and can include self-assessments and written conversations between the child and the teacher to

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see where the child is. For state standard requirements, the standard that has been met could be written at the top of the page and noted by the teacher. According to Layton and Lock (2007), the communication notebook emphasizes the dual responsibility by all that are involved in the child's education. Communication notebooks can be used to inform the child's parents on where their child is, what their child is learning, and what they need help with.

According to research, the Montessori classroom allows the teacher to meet the standards creatively while building a community of learners that encourages self-explorations, discovery, and purposeful play (Benham, 2010, p. 26). The Montessori classroom is all about "I can" vs. "I can't." The child is in control of what they are learning and the teacher is a guide. Together, the child, parent, and teacher are working through daily interactions to increase the knowledge of the child.

Researchers express the valuable role of parent education in the classroom and school. Parents are the driving force of education when the child is not at school (Dodd, 2007, p. 34). Assessments can be used to increase the understanding of parents in the classrooms too. These assessments can include:

- school-based learner outcomes
- multiple measures
- observation
- classroom based assessments
- standardized tests

Authentic Assessments

According to Damore (2004), the outcome of an assessment is authentic to each child and what they are learning, want to learn, and have learned. Each assessment is based on attributes including:

- material mastery
- standard mastery
- observation
- understanding

Overall, the results from our research indicated that as educators, we need to strive for mission-based learner outcomes. We need to develop research-based learner outcomes and appropriate measures of student achievement that reflect a whole child, and a lifelong knowledge approach: a Montessori approach to learning (Damore, 2004, p. 30). The development of learner outcomes will result in a more holistic balance approach to communicating expectations of student achievement. This will not allow us to fall into the measures of standardized tests, tests that were never designed for judging teacher or school quality. These tests have not proven the effectiveness of learning on particular standards by the individual student. According to research, the tests only mirror what has been taught in correlation to the standards and not what the individual child has learned (Jacobson, 2007, p. 30). Instead, we would have a more authentic way of measuring student achievement through journaling, portfolios, rubrics, and checklists.

Authentic assessment takes what children are learning and simply assesses what they have learned, and demonstrates skill mastery. The authentic assessment provides real world applications, such as counting money and making change vs. an abstract representation (Tanner, 2001, p. 24). The assessment can be maintained through

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checklists to show mastery of state mandated goals, district goals, teacher goals, and even personal goals set by the child. Finding a balance of authentic assessments is a challenge, but the struggle is worth it in the end. The learning of children and the assessing of what they have learned, in relationship to who they are, is key to student success.

Description of Research Process

As teachers in a public Montessori school, we have been challenged to blend the authentic Montessori approach with our school's traditional values and requirements. We decided to do an action research project to align the authentic Montessori assessments with the traditional state, district, and school mandated assessments. We were looking to find a way to meet the data analysis and collection needs of our school, and to better assess our students in their learning, and to find a more authentic approach to assessment. We decided that we would focus our research on the third grade South Carolina math standards.

Together, we worked in our personal rooms to collect and gather the data for our research as a single project. The classroom setting is in a Lower Elementary Montessori public school classroom with children ranging from six to nine years of age. Our participants in the study range from eight to nine years of age and are of African-American, Caucasian, and East Indian ethnicity. The participants consist of five males and twelve female students.

We are looking to gain a better understanding of our students and how they are assessed in the classroom. Our school uses district provided assessments for math that are not individually designed or developmentally appropriate. The same test is given to all children. We used our research to guide us in developing a more authentic approach

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to student assessment in third grade math. We worked to connect our individual students with the state standards at their own developmental level.

To begin with, we created a checklist of expectations (See Appendix A) based on the CCSS. The checklist was used to meet the needs of our school and district requirements for data collection and analysis. We were able to show our checklists as a skill mastery tool for administration, curriculum, and parent reports.

Then, an approval letter was sent home to gain parental permission for students to be participants in our action research. Once we received their consent, we moved forward by: sending home a parent input survey to gather information on what the parents know about their child and assessments, gather information on what the parent knew about the Montessori approach to education, what the parent knew about the state standards, what they wanted to know and see, and how they could help at home for further understanding (See Appendix B).

Next, we created a form to receive student input on their view of assessments in the classroom. We were seeking knowledge about each child and how they preferred to be assessed. We were looking to see if students liked the paper and pencil assessments, blanket assessments (one assessment for all students), individual assessments based on skill mastery through the Montessori materials, or one on one assessments through portfolios, student and teacher conferencing, and observation (See Appendix C).

Finally, we sent a survey to our colleagues within the school to gather their views on authentic assessments in the classroom based on the Montessori materials. We began with the question: What is an authentic math assessment to replace the district math

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assessments? Our colleagues were then asked to provide samples or ideas on authentic assessments and what they would look like (See Appendix D).

Once we gathered all of our input from parents, students, and colleagues we were ready to begin our action research. To begin with we gave our students a pre-assessment to be followed up by a post assessment (See Appendix E) on how they were assessed in the classroom. This information provided us with a basis to modify and begin our authentic assessment research for math CCSS. Through observations, checklists, and portfolios, we were able to collect the information that was needed for our action research. The information collected will be used in the future for assessing our students, and then will be shared with our administration, curriculum coordinator, colleagues, and the district representative for math.

Each student created a binder as their portfolio. In their portfolio, they made four sections labeled as the following: Checklist, Materials, Rubric, and Student Work. The checklist was used for the teacher and student to conference about what was needed to be mastered, what they were working on, and where did they need to go next. The Materials section was used as a guide (See Appendix G), similar to a pacing guide, to determine what Montessori materials they had mastered, what material was next in the sequence, and materials that they needed more development on. The rubric (See Appendix F) was used to show mastery of the Montessori material and the CCSS. The rubric was a self-check type of assessment for the student and was used as an observation and data collection tool for the teacher. The student work section provided the evidence of learning of lessons taught, mastered, and completed in alignment with the CCSS. This section became an important tool for us to use with our administration and curriculum

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coordinator to provide the data needed for school data collection. All four sections were beneficial in keeping a record of where our students were, where they were going, and what they needed more practice with mastering.

We took the CCSS assessments and scope and sequence, and blended the Montessori scope and sequence of materials to meet the needs of our action research (See Appendix A). From there we were able to create the checklist to show mastery of skills. In our traditional school setting, we were required to give district assessments in conjunction with our authentic assessments even though our research was based on the more authentic approach to assessing.

Analysis of Data

We found that many of our students preferred to be assessed in a number of different ways. Most students preferred to be assessed through the use of a portfolio to demonstrate mastery of skills learned in the classroom. The portfolio is a binder that contains student work that has been self-evaluated by the student and checked by the teacher. Another preferred method of assessment was to be assessed one on one which means that the child is tested by the teacher one on one. The skills mastered would be demonstrated by using the Montessori materials in the classroom. The least preferred form of assessment by our students was memorization and standards based assessments. Each student expressed a desire to be assessed through the use of Montessori materials and elements of the classroom that they were comfortable with rather than through standardized testing. One student said, "I think our teachers should be observing us." Another student said, "I think the teacher should be observing me with the Montessori

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materials.” On the other hand, we did have students express their approval on paper and pencil assessments. One student commented, “I really like it (standardized assessment) is very good for our brain!” Another student said, “I like the paper and pencil test, it is fun.”

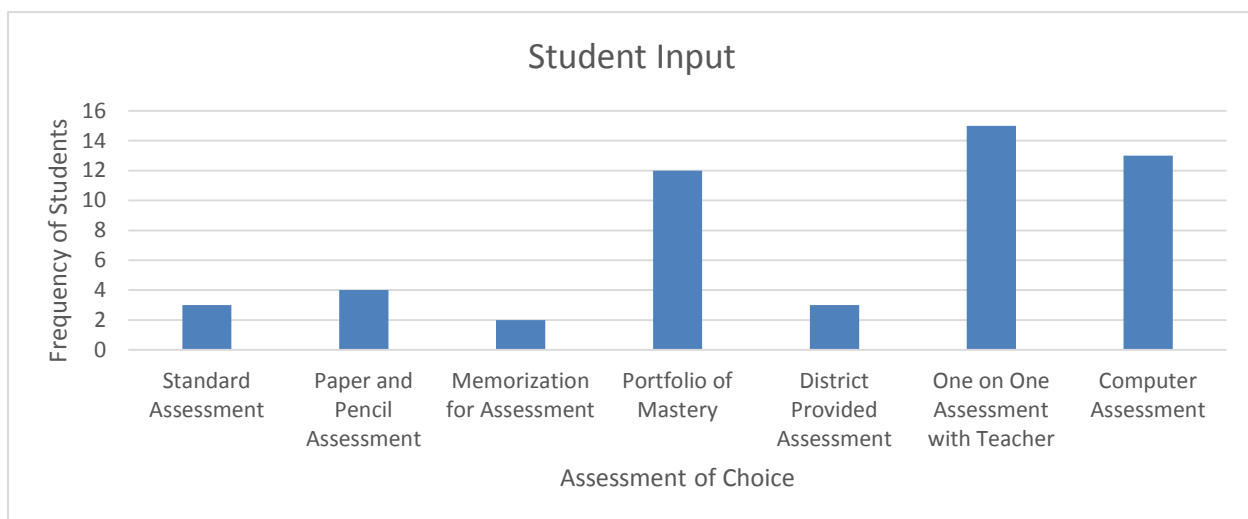
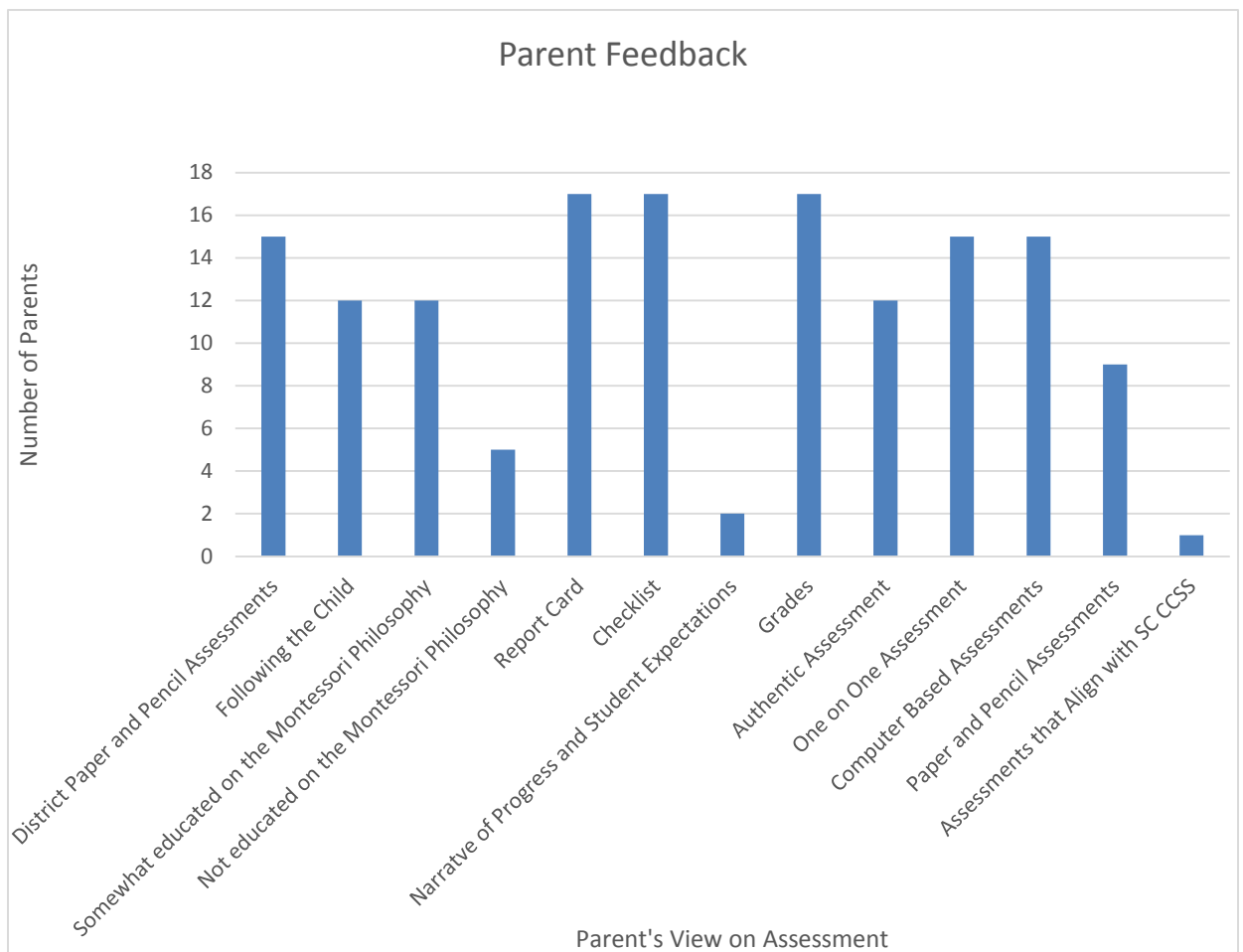


Figure 1. Student Input. This figure illustrates the type of assessments that students preferred.

After we collected the opinions from our students, we sent home a parent survey to gather information on the parents’ view of assessment in the classroom. We received a wide range of opinions from the parents. Almost all of them wanted to see their child assessed on a more individual level based on the Montessori materials, but some did not understand the Montessori philosophy and requested paper and pencil assessments with grades to be given. We found that many of the parents would like to see charts based off of a checklist that shows where their child is in relationship to the CCSS. According to our survey, some parents questioned were not as familiar with the Montessori philosophy, therefore, they did not have a strong opinion on authentic assessment. We found that

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these were the parents that wanted grades and a report card that reflected where their child was academically. “I do not have much knowledge on the Montessori philosophy, and I would like to have a parent education class.” said one parent. Another parent said, “I do not understand what the materials are and how my child learns from them.” On the other hand, we had parents that liked the idea of their child being assessed more individually like, “I would like an assessment system that aligns the standards to the Montessori materials.” Another parent stated, “The Montessori program was designed with the idea of following the child, I love my child’s teachers, but disappointed that the program is not more authentic with assessments and curriculum.”



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Figure 2. Parent's View on Assessment. This figure illustrates the parent's view on assessments in the classroom.

Next, we sent out a form to receive colleague feedback regarding assessments within the public Montessori classroom. To our surprise, many shared the same view on assessments, but they did not share the same methods of collecting data. All colleagues agreed with the value of following the child, observation, and checklists to show mastery of materials and CCSS in the classroom. All shared a general concern for time management with teaching double curriculum, Envision math and Montessori math. Two out of six colleagues preferred to assess only using written assessments based on the Envision math series that was adopted by our school district. The major concern expressed was the bridge between Montessori and traditional when our students leave the Montessori classroom and make the transition into fourth grade. Some colleagues preferred a "checklist to show a mastery of skills." Another colleague mentioned that, "An authentic Montessori classroom should assess a child when they are ready, not when it is mandated by the district or state." On the other hand, one colleague said, "I prefer the written assessment to see the child's thought process and to prepare them for transitioning into a traditional fourth grade setting."

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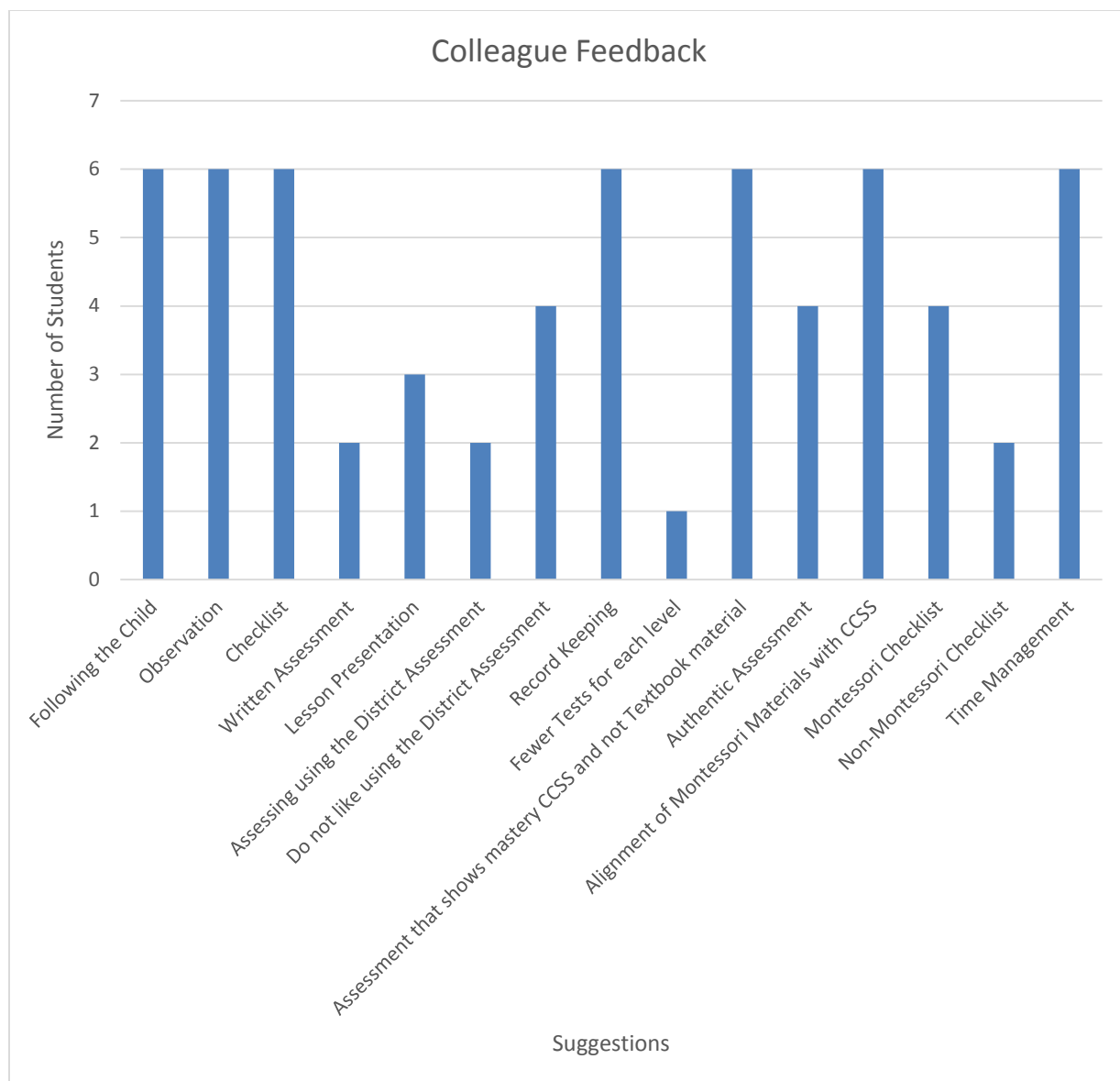


Figure 3. Colleague Feedback. This figure illustrates suggestions from colleagues about assessments.

Finally, we conducted our Action Research to assess our students on the CCSS through authentic assessments. Each student used their portfolio as a model for lesson mastery, record keeping, and data collection. As the teacher, we were able to conference with each child using the portfolio, gather samples of mastery on the materials, and

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observe what our students learned and knew about the topics in relationship to the Montessori materials. We found that using the district provided topic assessments for Envision math did not prove what our students learned. The Montessori materials and portfolios showed a better view of what each child mastered. Each child was able to show mastery on the Montessori materials which showed mastery of standards. This mastery was demonstrated through self-assessment, sample collections, and lesson presentations. Observations were made daily to monitor where the child was. According to our research, most children could show mastery of CCSS through the use of the Montessori materials at 100% where they fell short on passing the topic assessments.

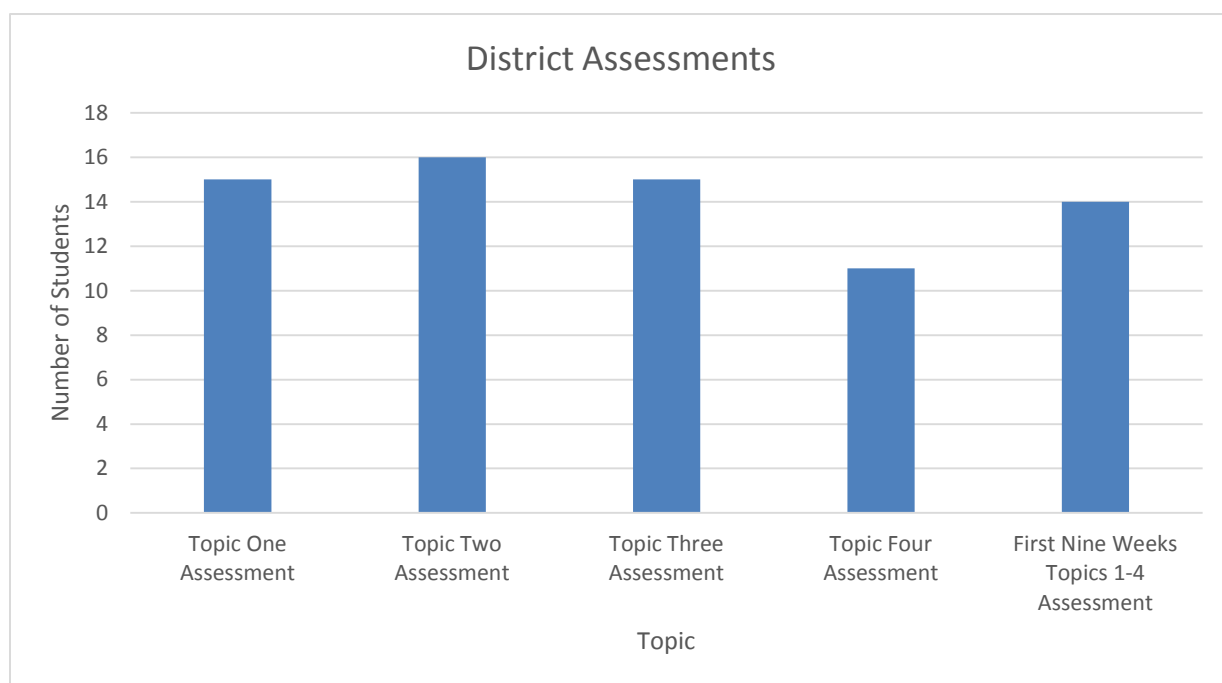


Figure 4. District Assessments. This figure illustrates the skills mastered according to the district provided math assessments.

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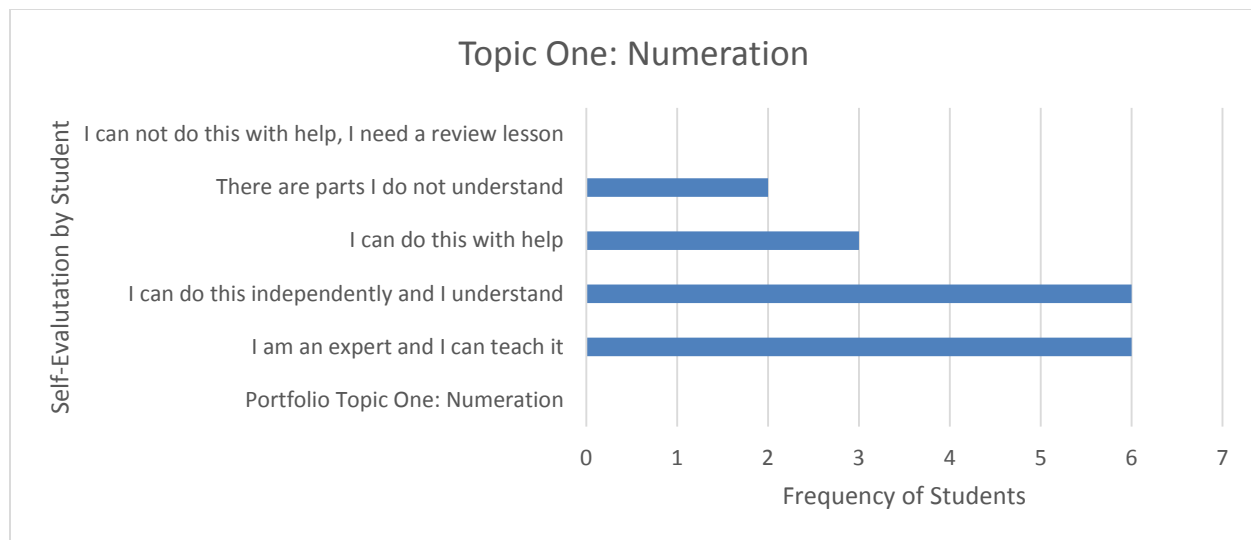


Figure 5. Topic One: Numeration. This figure illustrates the self-assessment scoring completed by the student on the provided topic.

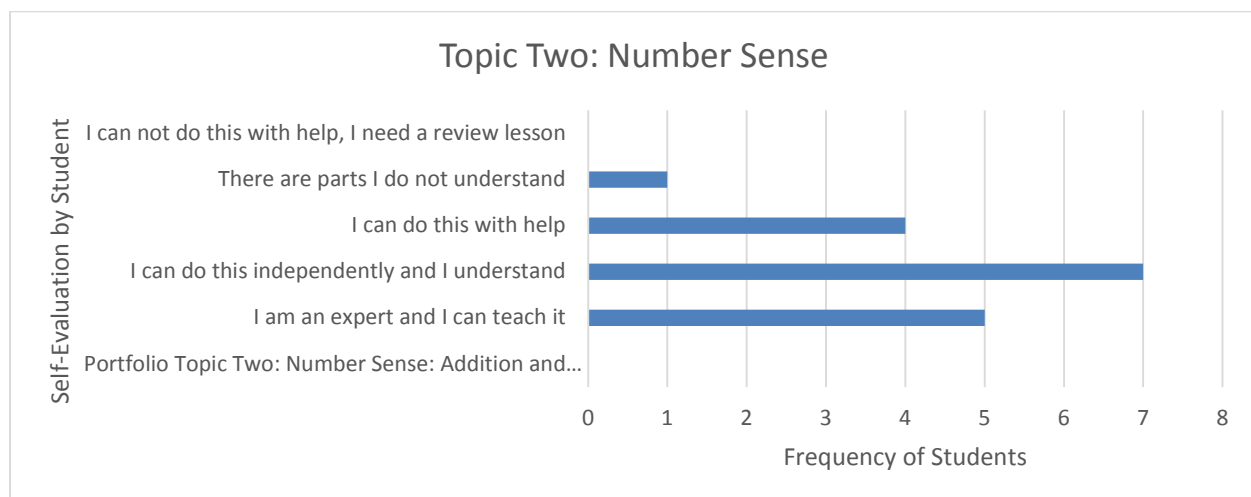


Figure 6. Topic Two: Number Sense. This figure illustrates the self-assessment scoring completed by the student on the provided topic.

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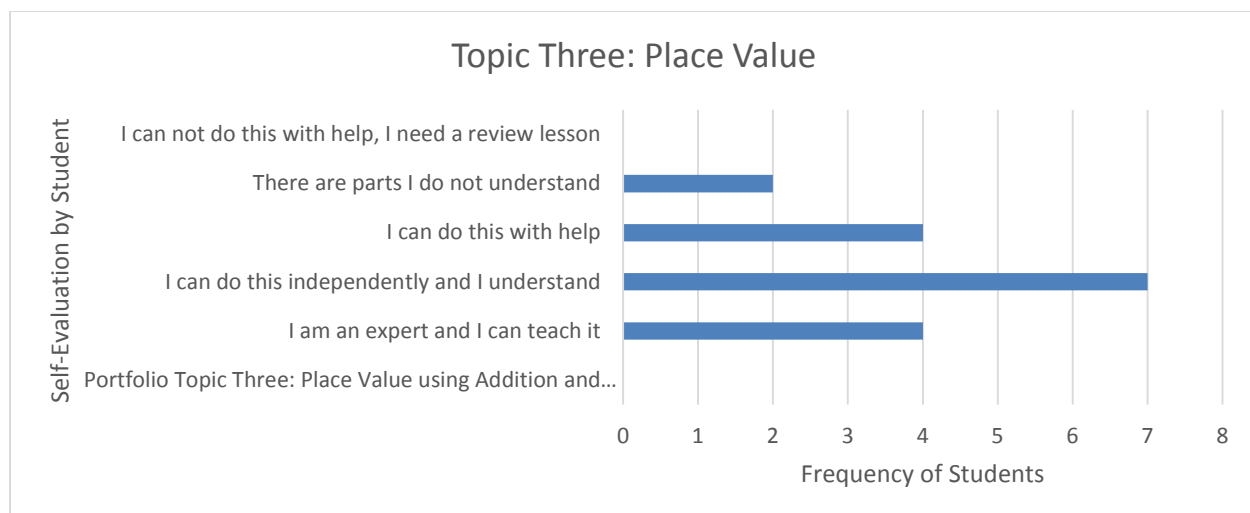


Figure 7. Topic Three: Place Value. This figure illustrates the self-assessment scoring completed by the student on the provided topic.

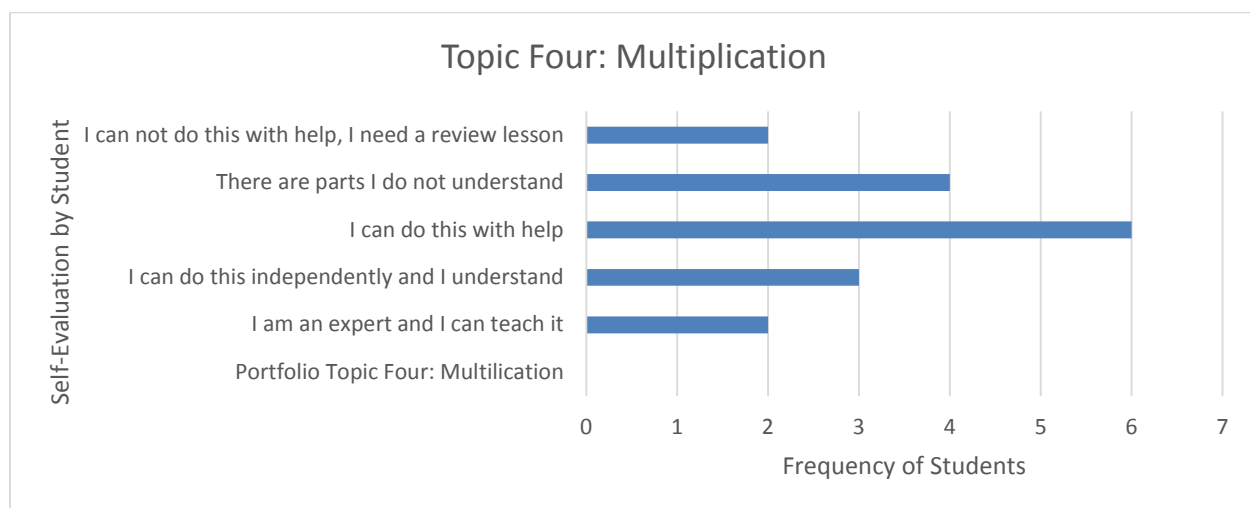


Figure 8. Topic Four: Multiplication. This figure illustrates the self-assessment scoring completed by the student on the provided topic.

We took the CCSS assessments and scope and sequence and blended the Montessori scope and sequence of materials to meet the needs of our action research. From there we were able to create the checklist to show mastery of skills. In our

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traditional school setting, we were required to give district assessments in conjunction with our authentic assessments even though our research was based on the more authentic approach to assessing. We discovered that our students understood more and could show mastery of skills much proficiently through the use of the portfolio versus the paper and pencil assessments that were given from the school adopted math program, Envision Math. The use of the portfolio was beneficial while conferencing with parents about their child. It allowed us to show them concrete examples of what their child was working on in class and where they needed more practice. Strengths and weaknesses were evident based on student performance and observation.

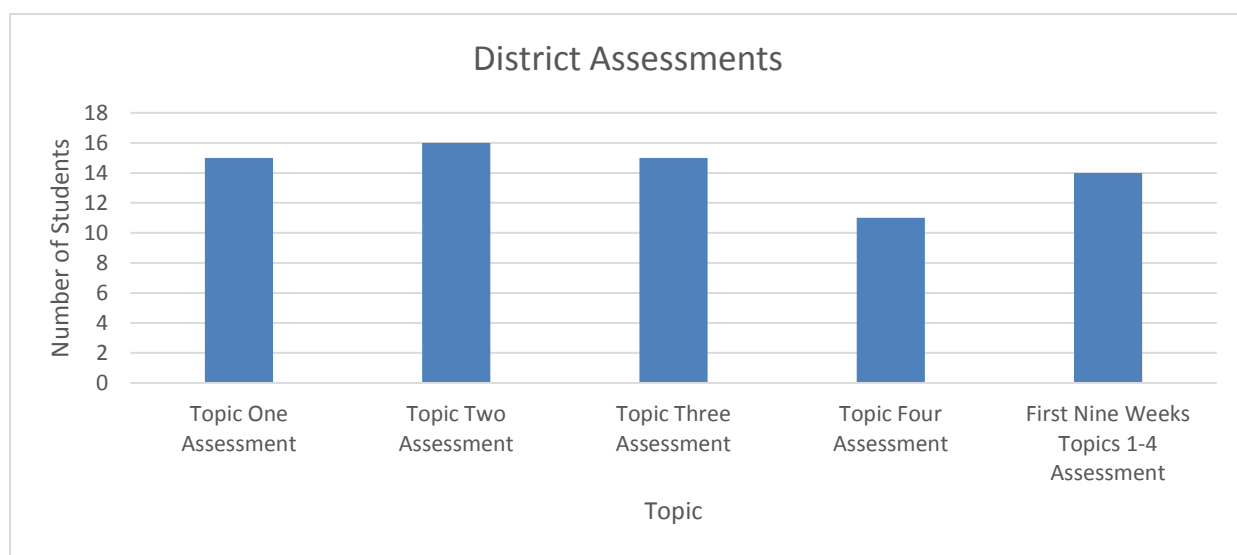


Figure 9. District Assessments. This figure illustrates the skills mastered according to the district math assessments.

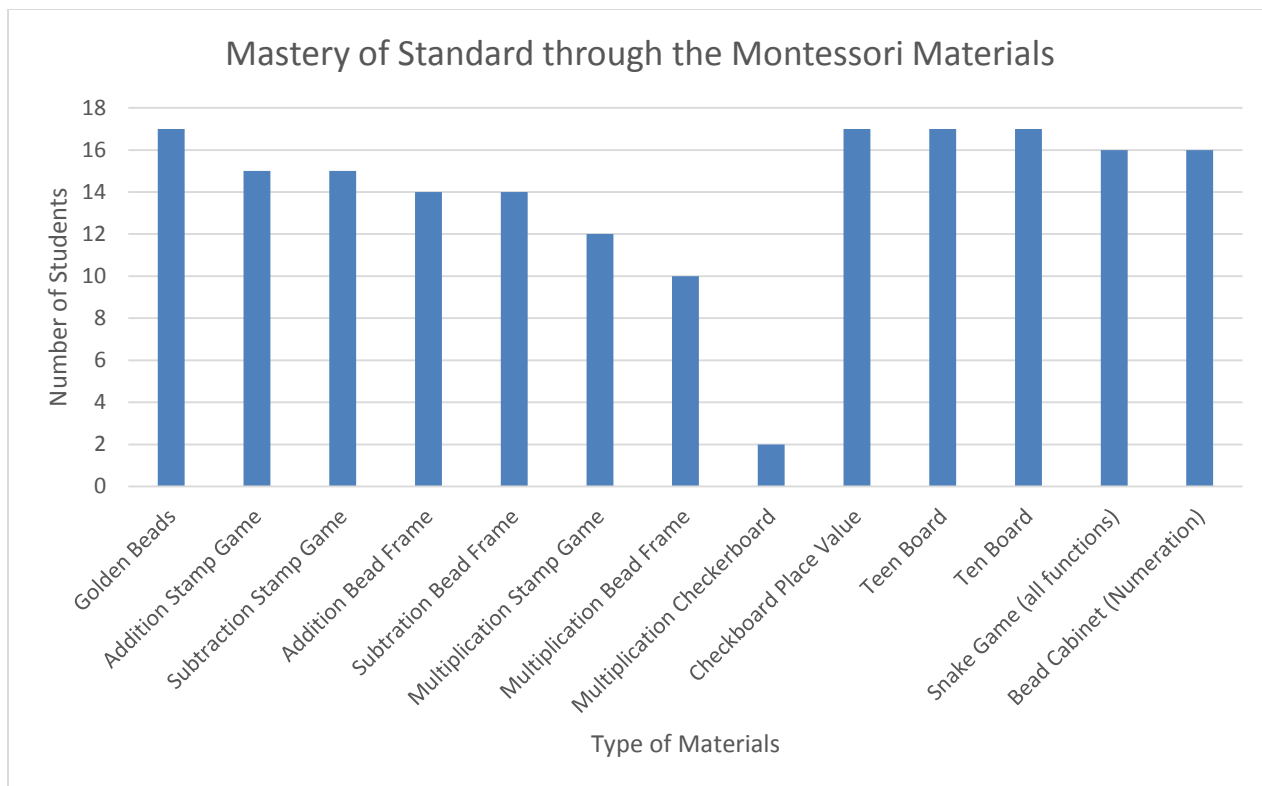


Figure 10. Mastery of Montessori Materials and CCSS. This figure illustrates the mastery of Montessori materials in relationship to the CCSS (See Appendix A for more information).

We are hopeful that our action research will enlighten our fellow educators on the importance of an authentic approach to assessments in the Montessori classroom and beyond. We are looking to use our data collected to jump start a new method of assessment in our school and district to better meet the needs of our individual students. With the alignment of CCSS and Montessori materials, we have gained a better understanding of the process of learning, development, and assessing mastery of standards by each child. Our goal is to have authentic assessments in place for the 2015-2016 school year for all three of our grade levels and work with other colleagues to set up authentic assessment for other Montessori classrooms. In our traditional school setting,

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we hope that we can share our information with other colleagues so that they too can better assess their students on an individual authentic method of assessment.

Sampling of Responses

Student Sampling of Responses	Parent Sampling of Responses	Colleague Sampling of Responses
I think the teacher should observe us.	I don't have much knowledge of the Montessori philosophy and would like a parent education class.	I prefer a checklist to see mastery of skills.
I like working with the Montessori materials.	When I was going to school, we got grades. If my child doesn't get grades, I don't understand where they are.	I prefer the written assessment to see the child's thought process and prepare them for transitioning into fourth grade.
I think it (standardized assessment) is very good for our brain.	I would like an assessment system that aligns the standards to the Montessori materials.	An authentic Montessori classroom should assess a child when they are ready.
I think the teacher should observe me working with the Montessori materials.	I don't understand what all of the materials are and what they learn from them.	A student should be following the Montessori scope and sequence and assessed only when they are ready.
I like the portfolio because it shows all my work that I can do.	I like a report card.	I have adapted to a mixture of Montessori and traditional.
I don't like memorizing facts because I forget things.	I like our current assessment system but I would like to know how my child is compared to other students with grades.	I would like the math assessments to be uniform across our school, district, and state.
I do have to memorize facts and I don't do good with that.	I like the narrative that explains how my child is working and what they are having trouble with but I don't understand percentages on some data charts.	I prefer teacher observation and using checklist.
I like taking the paper test. It's fun.	I like the Montessori program but wish I understood it better.	I do not like our current assessment system! It does not match the Montessori curriculum and we are not following the child.
I like to do a lesson that challenges me and have my teacher observe while I do my lesson.	The Montessori program was designed with the idea of following the child. I love my child's teachers, but disappointed that the program is not more authentic with assessments and curriculum.	I would like to see the State Standards and Montessori materials aligned with whatever assessments we are giving.

Table 1. A sampling of comments from students, colleagues, and parents. (See appendixes B, C, and D for more information)

Action Plan

Our Action Research proved that authentic assessments administered in the Montessori classroom measured mastery better than standardized assessment. In addition, the data also showed that the Montessori students had mastery of the concepts measured by the CCSS. Each child was able to grow and develop by using materials that they were comfortable with using, and then moved to a more abstract method of learning through paper and pencil assessments. The assessments that were given based on the Envision math series proved that our Montessori students knew the standards that were being assessed, but struggled to understand the language and formation of the very text specific assessments that were based on the math series.

The results gained from our action research will help us in creating a more authentic assessment for all grade levels. Through the use of observations, portfolios, checklists, and self-evaluations we have learned that our students can show mastery without having a formal paper and pencil standardized assessment. We hope to use this knowledge in the future to better assess our students. Written assessments are wonderful resource for documentation. However, according to our research, individual assessments more effectively demonstrate skill mastery of each child. Our evidence from the research will be presented to administration, curriculum coordinator, and district math coach to show the benefits of authentic assessments in the classroom using the Montessori materials helping to eliminate a secondary curriculum, such as the Envision math series. The Montessori philosophy has proven its effectiveness in our research, and now it is time to share and move forward with believing in the philosophy. We would like to provide parent education classes to increase the knowledge of the Montessori philosophy

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and how they Montessori classroom is different from the traditional classroom, particularly in the form of assessments.

Our students were more involved with assessments during the research because they took ownership in completing their portfolios. Otherwise, they would have just been assessed through teacher observation and paper and pencil form of assessments. They shared a sense of pride in completing a lesson, having it placed in the portfolio, conferencing with the teacher, and self-evaluating before moving on to the next level of development. Hopefully, by being a participant in this research project, our students will have increased their intrinsic motivation across the curriculum. We want our students to enjoy learning and to not be afraid of assessments. The use of authentic assessments takes the stress out of taking a paper and pencil assessment and even the concerns they have in standardized assessments. At the end of the year, each child will have their own portfolio that they can look over for review, share with their parents, and be proud of their accomplishments from the year. For our returning students, we would keep the portfolio and add to it each year through the three year cycle.

The portfolio method was a success in our classroom, therefore we would like to share this idea with our traditional education colleagues as a tool for assessment with their students. The portfolios can be used to obtain student grades, to inform parents of student strengths and weaknesses, and as a form of data collection for the teacher.

When transitioning from Montessori materials to the abstract form of learning, our students would be exposed to the higher level of thinking skills and vocabulary through extensions of each math lesson. Obtaining this higher level of thinking skills and

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vocabulary will better prepare them for the state, district, and school formative assessments. They will be accustomed to key terms and concepts through these extensions. In order to better prepare our students, the Montessori lessons will need to be modified in terms of vocabulary to help build these higher order thinking skills in preparation for the standardized assessments.

Being in the public school setting, we are required to teach a dual curriculum, therefore students need to be exposed to the rigor of state, district, and school formative assessment in conjunction with the Montessori materials. Since rewording our assessments is not an option, we could better prepare our students by exposing them to the rigorous vocabulary on standardized assessments, while also allowing them to focus on the scope and sequence of the Montessori curriculum and materials, allowing for a more authentic Montessori program in our school.

For future action research, we would like to try this form of authentic assessment for an entire year and with all three grade levels in the classroom. We would like to expand into other curriculum areas outside of math. The authentic form of assessment has helped open the lines of communication with parents and allowed for more parent education as we describe and share the findings our research. At the beginning of our research, many parents were concerned with how their child was going to be assessed, but through conferencing and sample collections they were able to see first-hand what their child has mastered.

References

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Appendix A

Checklist of Expectations

Student Assessment
First Nine Weeks
2014-2015

Student Name: _____

Date of Mastery	Notes	Standard	Traditional Assessment (Paper and Pencil)	Montessori Assessment (Montessori Material)
		3.NBT.1: Use place value understanding to round whole numbers to the nearest 10 or 100.	Topic One Unit Test Numeration Topic Two Unit Test Number Sense: Addition and Subtraction	Stamp Game Golden Beads Bead Frame Checker Board Teen Board Ten Board
		3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Topic One Unit Test Numeration Topic Two Unit Test Number Sense: Addition and Subtraction Topic Three Unit Test Place Value: Add and Subtract	Stamp Game Golden Beads Bead Frame Checker Board
		3.OA.8: Solve two-stepped word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (Order of Operations)	Topic Three Unit Test Place Value: Add and Subtract	Stamp Game Checker Board Word Problems
		3.OA.1: Interpret products of whole numbers, e.g., interpret	Topic Four Unit Test Meanings of Multiplication	Stamp Game

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		5 X 7 as the total number of objects in 5 groups of 7 objects in each.		Golden Beads Bead Frame Checker Board Snake Game Hanging Beads
		3.OA.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	Topic Four Unit Test Meanings of Multiplication	Stamp Game Golden Beads Bead Frame Checker Board Snake Game Hanging Beads
		3.OA.5: Apply properties of operations as strategies to multiply and divide. (Commutative Property, Associative property of multiplication, Distributive property)	Topic Four Unit Test Meanings of Multiplication	Stamp Game Golden Beads Bead Frame Checker Board Snake Game Hanging Beads
			First Nine Weeks Assessment Topic 1: Numeration Topic 2: Number Sense: Addition and Subtraction Topic 3: Place Value: Addition and Subtraction Topic 4: Meanings of Multiplication	

Appendix B

Parent Input

Parent Input

We are seeking your feedback on assessments in your child's Montessori classroom. Please fill out the form below and return by **Monday, September 1, 2014**.

1. How do you feel about the current assessment system in place in our classroom?

2. What do you know about assessing a Montessori student?

3. How would you like to be informed of your child's progress?

4. What suggestions do you have for ways to improve assessments in our classroom?

Appendix C

Student Input

Student Input

1. How do you feel about taking a standard assessment for math?
2. Do you enjoy taking paper and pencil assessments? Explain
3. What kind of assessments do you like? Explain
4. Do you memorize answers and facts for assessments? Explain
5. What do you feel is the best way to demonstrate what you have learned?

Appendix D
Colleague Input
Colleague Questionnaire

1. What should an authentic Montessori assessment consist of?
2. How do you prefer to assess your students to show mastery of skills taught?
3. How do you like our current assessment system in math?
4. What changes would you like to see in our math assessments?
5. If we created a new math assessment system, what would you like that to consist of?
6. How do you feel about a math checklist that demonstrates mastery of SC state standards taught through the use of Montessori materials as a form of assessment?
Please explain.

Appendix G

Classroom Materials

Student Chosen Assessment

Student	Standard	Traditional Assessment (Paper and Pencil)	Montessori Assessment (Montessori Material)