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How has Standardized Testing Affected Low-income Communities?

Melody Orozco

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Abstract

This paper will go into detail on how standardized testing has affected low-income communities. The participants for this Capstone Project include a group of 26 fourth-grade students in a public elementary school from California’s Central Coast. When looking at test scores, they reflected the academic achievement of students. There has been an achievement gap when comparing school accountability report cards (SARC). Orozco created an alternative assessment method that can be used to replace the standardized test. Orozco’s findings evaluated if an alternative assessment method in mathematics could positively impacted low-income communities. The student’s performance to the alternative assessment method was equivalent to their SARC score which implied that Orozco’s alternative assessment was neither better nor worse than the standardized test. Orozco will use this Capstone Project to better assess her future students, and will build on her research of finding an alternative assessment method.

Keywords: low-income, academic achievement, standardized testing
Multiple choice testing has been done since the early 19th century, due to a large quantity of people migrating into the United States. Frederick J. Kelly invented multiple choice testing in 1914 since two years of secondary school became mandatory. With the children trying to be put into school, there needed to be some type of system to test their academic ability as quickly and efficiently as possible. The same strategy of multiple choice is used in today’s education system which was found by former president Lyndon B. Johnson in 1965, though the Elementary and Secondary Education Act (ESEA) and his fight for the “War on Poverty”. Through standardized testing, Johnson helped low-income communities through their test scores. “Low-income students fail to graduate at five times the rate of middle-income families and six times that of higher-income youth” (Sikhan, 2013, p. 1). For low-income families this was the first time a president was going to help education. The affect standardized testing had on low-income communities is an important factor for the school system today because it allows for the progress of how students are academically achieving.

Following Johnson after the “War on Poverty”, then under the Reagan Administration there was then “A Nation at Risk” in 1983. “The College Board's Scholastic Aptitude Tests demonstrates a virtually unbroken decline from 1963 to 1980. Average verbal scores fell over 50 points and average mathematics scores dropped nearly 40 points”(A Nation at Risk, 1983, para. 8). In 1983, America was behind in test taking, yet was supposed to be one of the leading nations. Then under former president H.W. Bush, there were four foci “standards, assessments, and accountability; school finance reforms; teacher training and school resources; and school
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choice options” (Hurst, Tan, Meek & Sellers, 2003, p. 2). Through this quote, it helps identify student achievement and what they were learning by the students grade level.

Soon after, the Clinton administration made the decision for states to be liable for taking the standardized tests and reporting back. “New academic standards that specify what students are expected to know and be able to do in the core academic subjects at key grade levels; assessments that measure progress against those standards; and accountability systems that, at a minimum, provide annual public reports on school and district performance” (Schwartz & Robinson, 2000, p. 173) and this is how states had to come up with their own standards and curriculum to report back to the government.

The Bush administration then implemented the No Child Left Behind Act (NCLB) in 2001, that pushed a standardized test to an ultimate high. The ESEA was so old that it was then modernized and was transformed to be the NCLB. Through the NCLB, it helped push students forward to be at grade level by 2014, which was done through yearly testings. All states were in charge of making sure their students were achieving academic proficiency which means their students were at grade level or above. NCLB vowed to help students, regardless of their economic status gain the highest of educations. Through Title 1, special programs were created to help disadvantaged students, but it was costly and not meeting NCLB mandates was high. In 1965, for Title 1 it states, “as Improving the Academic Achievement of the Disadvantaged (currently Helping Disadvantaged Children Meet High Standards) and its part A (Improving Basic Programs Operated by Local Educational Agencies)” (Boehner, 2001, para. 1).

America is currently under the 2015 Every Student Succeeds Act (ESSA) which the Obama Administration implemented. Despite race and economic background, every student will
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be able to receive an equal opportunity education similar to NCLB by following Title 1 policies. For research purposes, students take required yearly testings which is the standardized test. The testing shows the lowest 5%, and this lets the government know which schools need the most help.

The achievement gap has yet to close and low-income communities are shown in SARCS to be at risk. “Historically, low-income students as a group have performed less well than high-income students on most measures of academic success—including standardized test scores, grades, high school completion rates, and college enrollment and completion rates” (Reardon, 2013, p. 1). Low-income families and communities have less resources available than the communities of high-income levels and standardized testing has played a roll when it comes to the academic achievement of low-income families.

There are consequences for when schools do not perform well on the standardized tests. “Low scores in the school can lead to the state or district taking over a school and possibly closing the school and then reopening it with a new program and staff (sometimes referred to as “reconstitution”)” (Newmann, Bryk, & Nagaoka, 2001, p. 10). Therefore when a school does not perform well, two options can happen. The states can go into the school and fix the issues and change the curriculum that is going on within the school, or schools can shut down completely and be turned into a new school and have new staff, or just be completely shut down. This is done because a change has to happen within the school so students can then achieve at a higher level with new programs being implemented. This can be a problem in some cases because in the National Center for Educational Statistics, they said that in 2014-15, about 1,573 schools had closed down, and from the year prior those schools held more than 200,000 students. When
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schools close, the students will be transferred to the next closest school to them in hopes for a better education.

Specifically in Orozco’s study, she will be looking at a fourth grade classrooms ability to test. The capstone project will be on how the students test in a typical standardized test, and see how well they perform. Orozco will test the students in a vary of ways to find the best way to assess students in low-income communities.

**Evaluation of Options**

There are numerous ways to help affect low-income communities in a positive way, and these solutions have been brought to help greatly affect them. One option would be to create tutoring centers, and possibly an after school care system. With a tutoring center, students can be more engaged in their learning while being watched after school. To effectively test students, the second option is to find an alternative assessment method. The third option is start offering more training for teachers. If teachers are to be trained for the standardized tests, students should be taught the correct information they should know for their grade level. The last option is to implement a Science, Technology, Engineering and Math(STEM) program. With STEM, the community is more involved, and students enjoy going to school when they have a project to work on. These options will not only affect low-income communities in a positive way, but it will create a new way to test students in a positive environment.

Orozco will evaluate these options through three forms of criteria: *cost*, *student retention*, and *has a test been done where test scores are improved through this method*. *Cost* will be evaluated by the amount of money that needs to be put into the option. Next, *has a test been done to improve this method* is measured by if a study has been done before that shows that
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option would work. Last, *Student retention* is measured by if the students performance has increased since the option was implemented. These are all important options to keep in mind for Orozco’s matrix because they will be what helps create a good foundation for the change and improvement Orozco would like to make.

**Tutoring Center**

One way Orozco can help low-income communities would be to create a tutoring center. A tutoring center can be done for extra help, and allow for students to come with what they’re not achieving well on. By giving students the extra help, it will allow for them to feel efficient when it comes to studying for a test, doing homework, and grasping the concepts that are being taught in class. If students have a tutoring center that is regularly available, they can also gain confidence within themselves through it.

The first way to evaluate this option is *cost*. If schools can have their teachers in the tutoring center for one hour once a week after school and rotate out, this would not cost any money because teachers are on a salary. Also, the one hour for tutoring could be child care so the extra hour can be used for the low-income families to be able to work for an extra hour.

Another way to evaluate this option is *has a test been done where test scores are improved through this method*. There is a company called Kumon, which is an enrichment program for students to grow academically and build a foundation for success. Kumon is one of the worlds largest enrichment programs and they help tutor students from preschool to the end of high school. Creating a tutoring center that can resemble the Kumon company is a good option because student growth is high in this method.
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The last way to evaluate this option is through student retention. “Tutored students passed their courses with a grade of C- or better at a rate of 75% compared to 71% for non-tutored students” (Hendriksen, Yang, & Hall, p. 60) Tutoring, either one-to-one or in small groups, provides that additional personal interaction and support that students—especially at-risk students—might need. (Pg 61, Para 1) There is a slight difference for students who succeed better when they are tutored versus when they are not.

**Alternative Assessments**

Another way Orozco can help low-income communities would be to change the assessment method. Sometimes taking a test stresses students out, which concludes to them guessing just so they can finish taking the test. One way to change the assessment method is to allow for a short answer comprehension question. Through this it allows for students to critically think, and answer in a way that can process in their own mind versus the confusing questions they may get in the standardized scantron test that they get.

First, does this *cost* any differently than what is currently implemented is what should be thought about before anything else. If the companies who created the booklets for the test changed the multiple choice to a fill in the blank or open free write space, it could be a simple change. No matter what, states must buy the booklets and this way it excludes the scantron so money is possibly saved.

Another way to see if alternative assessment is a good option for Orozco is *has test scores been improved by this method*. Reading comprehensions have been done for years, and so has fill in the blank. If we take the scantron out of the test, and take away the multiple choice, we
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...can really see if students are understanding what is asked of them, therefore the academic achievement of students can really be seen.

The last way to see if this option is a good one is through student retention. If teachers were allowed to flexibly assess their own students, then achievement can be identified on a personal level instead of all the same. No two students are alike therefore alternative assessments for low-income students retention is a valid option.

**Train Teachers**

The last option Orozco can do to help low-income communities would be to train teachers. If teachers had more training, especially when helping communities with low socioeconomic students, they could better help the wide variety of students who are disadvantaged. With hopes that training teachers would make for better test scores, this would reflect on how the teacher is successfully teaching the students. “The goals of the intervention were to increase the pass rate from grade to grade, to increase scores on achievement rates, and to improve the school climate” (Angrist, & Lavy, 1998, p. 3). In a study in Jerusalem, they had teacher training to help student achievement in passing grades, doing better on test scores, and improving the school climate. “Although a comparison between emergency/probationary/no-certification-in-subject teachers and standard/private teachers still shows that students with lower socioeconomic backgrounds tend to get teachers with probationary emergency credentials or no certification in their subject” (Goldhaber, & Brewer, 2000 p. 136). If teachers have more training regardless of their certification status, it would help students improve.
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The first way to validate this option is cost. Top nations for example Singapore in global competition pay their teachers as if they paid doctors and lawyers therefore the pay for teachers in the United States should go up, and training should be done. Hiring people from the state to help train teachers would be beneficial. This option is definitely the most costly, but most beneficial long term.

The next way to see if teacher training is beneficial would be has test scores been improved by this method. Some studies have been done which indicate that regardless of the teachers credential status, there is no significance between test scores with teachers who do or do not have credentials.

The last way to assess this option is through student retention. When students enjoy their teacher it allows for a more open atmosphere within the classroom. This means students will want to learn and want to go to school. If teachers are highly train throughout the course of the school year, it should allow for more student retention.
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Table 1
[The Matrix]

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Study been tested</th>
<th>Student retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutoring Center</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Alternative Assessment</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Train Teachers</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

The matrix analyzes the three options based on the criteria: cost, has the study been done to improve test scores, and student retention. Based on a scale ranking from 1-3, 1 being the lowest and 3 being the highest.

Capstone Project

Orozco’s capstone project will be based upon how standardized testing affects low-income communities. Low-income communities have the lowest test scores and most disadvantaged students than any other community. Orozco would like to go into a school setting, and create a lesson plan on alternatively testing students. Instead of a fill-in the bubble multiple choice method, Orozco would like to find the most unique way to assess the students on their own capability. Orozco believes the standardized test is a generalization on what students need to know, but if they are tested in a way that works best for them, low-income communities may have higher test scores than using the first method.
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**Project**

As shown in the Literature Review, the focus Orozco has is what standardized testing is, and its effect in low-income communities. Students in low-income communities historically score lower on the standardized tests than those of middle and higher-income communities, and the outdated testing method does not work for every student. Orozco would like to implement a new testing method that does not relate to the current fill-in the bubble style that the standardized testing currently has to help improve test scores.

Orozco has created a lesson based on the criteria that was used in the Literature Review. Creating an alternative assessment method can benefit students by being able to create their own work while being graded through the same rubric. The implementation of the project would include the “Mathematician Method” which was created by Orozco, and students being able to formulate an image on a 10 by 10 grid, and using that color coded image to represent a fraction and a decimal. Students were given a worksheet to complete as an alternative assessment for fractions and decimals. This benefited the students because the assessment became their own where they were proud of their design and showed their understanding of fractions and decimals. The results will be explained in the evaluation.

**Design**

The site Orozco will be doing her capstone project at is in a multicultural and diverse community in Marina, California that supports transitional kindergarten to fifth grade, which is roughly 400-415 students. The school has almost fifty percent Latino or Hispanic, almost thirteen percent White, almost six percent Black or African American, and almost six percent Asian and other. About seventy two percent of the students are socioeconomically
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disadvantaged. There is about twenty one percent English learners. Last, almost fourteen percent of students have disabilities. As found on the SARC 2017-2018, and this school is a Title 1. It is also a public school.

The mission for this school is “to provide the highest quality education in a secure, positive, and challenging environment for all students fostered by a cooperative effort between school and community. We aim for an atmosphere of cooperation with respect for individual differences and community values.”(Schools Mission, Values & Beliefs) This school is community driven, and revolves around a positive environment for students to be successful.

The vision is “to create a challenging learning environment that encourages high expectations for success through the development of appropriate differentiated instruction that allows for individual differences and learning styles. All learners are encouraged to be self-sufficient, responsible, cooperative and caring members of our community.”(Schools Mission, Values & Beliefs)

This school also has nine beliefs which are: “Respect for each individual is fundamental to teaching and learning, all children can learn given appropriate time, instruction, and access to resources, students must have an opportunity for high-quality education in the least restrictive environment necessary to realize their potential, students benefit academically in a safe, supportive and stimulating environment, students’ learning, attendance, and behavior improve when they are actively engaged in meaningful work, education is a shared responsibility. It is a partnership of home, school, and community, an effective balance and interdependence must exist among the written curriculum, instruction in the classroom, and assessment for and of learning, high standards and expectations must be maintained through a system of accountability
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for all students, staff, and schools, quality faculty and other staff are essential to school excellence.” (Schools Mission, Values & Beliefs)

Orozco chose this school because Orozco had spent the last three semesters working in the classrooms and helped during lunch and recesses. This site is considered convenience sampling because the students and staff know her as a volunteer, and service learner. The site is close to where Orozco lives so it is convenient for her. Orozco has worked with multiple grade levels and seen students grow in this school as well as through her work as a My Museum Visitor Experience Associate. Some students who attend this school are members at her job where Orozco has hosted parties for the students and regularly see them come in with their families. Orozco has seen a lot of community around this school and being in the area which makes her feel obligated to help when Orozco knows the students, and sees them around the town.

How has standardized testing affected low-income communities? The school Orozco chose is a Title 1 school therefore supports her topic the most. Adding to how it has changed due to standardized testing can be found at this site for being a pilot for STEM (Science, Technology, Engineering and Math) program as shown in the Principal's message. The school is working on STEM due to their test scores being low in those areas. When looking at the SARC, the students who met or exceeded math on the standardized test was about twenty six percent, and N/A for students who met or exceeded science. Looking into this information, it tells me that one hundred percent of students need help in science, and seventy four percent of students are below grade level in math.

Orozco wants to be able to identify the problems with why the students are not at grade level, and find the reasoning behind this issue. Orozco may need to look into the entire districts
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SARC’s in order to see how the entire district is performing. The standardized tests have affected this low-income community in possibly a positive way because it is showing the students abilities at this cite and who is achieving. Orozco would like to find a way to help improve the test scores of the lower achieving students.

Currently the school district associated with this school has implemented the STEM pilot program therefore trying to create some type of change for these students. For her capstone project, Orozco wants to revolve around how the standardized test affected this low-income community by investigating why this STEM program was put into action to this school, how students math and science skills are currently like, and how can she create a way to help the students learn and score better when it comes to math and science.

So far what Orozco has observed in a fourth grade classroom, the school has the student do a certain amount of time on laptops per week working on a website that has teaching videos and comprehension questions on math and other subjects. Orozco has seen students constantly get the questions wrong and ask her how to help them because learning through a computer was not what was working best for them at the time. Orozco understands that this is what the district wants the students to be doing in order to score better in tests, but Orozco wants to be able to ask these students if they are actually learning and how hard the laptop work is for them. Orozco would like to be able to say this is a problem, and something else needs to replace the current system they are using. The website accumulates data on the students, but at what cost? Too much time is being spent on the laptops and Orozco would like to do more research as to why, for what reason, and what happens if the teacher for the classroom does not obey to the requests on the students being on the laptops for that much time.
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Standardized testing in this low-income community is a controversial subject in which Orozco would like to see if it is positively or negatively making an impact for low-income communities. When going further into research, Orozco could see that the standardized tests is showing the academic performance of the school. With this information Orozco sees students need the help in math and science, so therefore Orozco may be able to create some type of way to help this community. What is happening now is not working, and Orozco thinks it is because of the low test scores from the year prior and new changes being made. Orozco’s hope is her assumptions are true that the standardized testing scores is what caused the laptops to be implemented, and from there Orozco will try to create a way to teach the students a better way or maybe strategies on how to be at or above grade level in those subjects. It may be as simple as creating an alternative assessment method for the students who need the extra help.

Implementation

To see Orozco’s lesson plan see Appendix A.

Orozco went into the classroom, and reviewed fractions with the students. She then talked about decimals and went over what they were as review for those students since they had already learned both. Then, Orozco showed the class the worksheet they would be filling out which is the alternative assessment called “The Mathematician Method”. Step by step, Orozco and the students went over what to do. Using the “I do, we do, you do method” the directions were then posted on the projector screen. The worksheet was handed out and the students began to work.

The directions that were on the screen was step-by-step instructions. Step one was to shade in the squares. Step two was to write down each color under the word color. Step three
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was write down the fraction they used for the color. Step four was to turn the fraction into a decimal.

There were frequent questions that were asked for example, “How many colors were the students allowed to use?” which was as many as they liked and, “Can I color half a square?” which was responded with, “If you can make it into a fraction.” Orozco walked around the classroom observing the students work. Frequent comments students made was, “This is so easy” and “Why is all of our work so easy?” The classroom teacher would then respond with, “I’m happy you find this easy, it better be correct.”

In the picture below, the student created their own design within the 10 by 10 square. Then they wrote down which colors were used followed with the correct fraction, and decimal. This shows that the student understood the project, and could correctly make a fraction with their own work as well as turn it into a fraction.
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Orozco, M. (2019). *Student 1*
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Orozco, M. (2019). *Student 2*
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In the picture above, the student created their own design, but also created a way to separate each piece of work with lines and boxes. The design was original and the student showed how they can do a fraction, but had trouble with smaller numbers and converting them into a decimal. Picture 2 is a good representation of what the class knew. Fractions was easy for the students but creating a decimal seemed like it was hard when doing numbers under 9.

In the picture below, the coloring in some squares looks like the student did it one by one. This student was the last to finish, and spent a total of forty minutes working strictly on coloring. When it came time to completing the assessment, the student handed Orozco the paper and said they were done. The student did not complete the total of fractions with the colors they used, and did not do the decimal conversion.
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Orozco, M. (2019). *Student 4*
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The picture above is another great representation of how students created their own design, and were able to make the fractions of each color they used and turn it into a decimal. This student was one of the first to complete the assessment and completely understood fractions and decimal conversions.

**Evaluation**

After going over the assessment, the students had a good understanding of what was asked of them. They followed instructions and the assessment went by smoothly. Orozco was expecting the students to not talk, but that was hard to not do when coloring felt as a social activity in the classroom. When it came to doing the assignment part the Orozco observed the students were to themselves, and did not ask anyone for help on their own work. What Orozco would do differently is limit the amount of colors the students are allowed to use. For example some students used up to eight colors, and Orozco would limit it to five in the future. Another part of the worksheet that could be changed would be making clear boxes for the students to write their answers in. As seen in *Student 2* the student created their own box to follow. Many students used this method, and it would be easier for the students to follow their work. The Assessment went as planned, and the students met the objective of formulating an image on a 10 by 10 grid, that represents a fraction and a decimal. The information may not have all been correct for all students, but almost everyone wrote something down for each section. If Orozco redid this project, she would make the changes she saw that were needed, and give students a time limit for how long they can color. Orozco will not have to redo the assessment because it shows what the students know, which was what needed to be done to prove that an alternative assessment works better than a fill-in the bubble test.
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**Reflection**

This portion of the paper will be a review of the Capstone Project as well as limitations and recommendations Orozco has. The discussion will go over how the literature review reflected within implementing an alternative assessment method for her project. There were success and challenges that arose during the implementation of the “Mathematician Method”. Recommendations for future Capstone students will be in this portion of the paper. The fourth grade class Orozco assessed gave her the opportunity to create a project where it could be built, and improved so that will be discussed in the future plans Orozco has for her Capstone project.

**Discussion**

Orozco discovered that her alternative assessment of the “Mathematician Method” was a good in class assessment to do. She believes this because it was not taken seriously by the students, and was looked at as just another worksheet the students had to complete. As far as the results had gone to replace the Standardized Test, Orozco believes it is a good testing method, but it does not give a good overall understanding of fractions and decimals. The students found the worksheet easy, but when it came to grading the worksheet most students did not perform as expected. The 10 by 10 grid may have been too big for the students who had intricate designs and the way the worksheet was formatted could have been more organized.

There was a few successes of the “Mathematician Method”. The first one was that all students enjoyed creating their own designs within the 10 by 10 square. The students were also excited that they could use as many colors as they wanted to which they could not do in other assignments as described by their teacher. Orozco was able to see how an alternative assessment
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worked by seeing the students reaction to the worksheet. As said before, the students found the assignment as easy and the creativity and engagement of the students was a success.

There was also a few challenges within the “Mathematician Method”. One challenge was that the students wrote to large so it was illegible to read. Students who used a lot of colors found it more difficult to count their fraction. When it came to the worksheet itself, some students created their own lines to help separate their work, which is something Orozco should have done before printing out the pages. The last challenge that was faced was that not all students were able to create their own design and have the correct answer to go with their design. This is a challenge because it can’t be determined as a good alternative assessment method if most students work was incorrect. The challenges which were faced was good for future use on this worksheet.

There were two limitation Orozco had, and one was that the worksheet that was handed out could have been done a little more neatly. As shown in a few students work, they created their own lines to make the work neater that helped them follow their work more clearly. If Orozco put the lines to separate the students work, a different outcome could have been made because it seemed that some students work was all over the place. Another limitation is that Orozco took nineteen units which came to be a total of five classes. With so many courses being taken, it limited fewer hours that could be dedicated for the capstone class itself. Orozco wished she had less on her plate when it came to taking Capstone because the Liberal Studies Department has high compacted units for students who want to graduate sooner. This was a personal choice, yet it determined the ability of dedication that was amounted to work on the Capstone.
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**Recommendations**

There are three recommendations Orozco has for the Capstone Project of the Mathematician Method the students used. While Orozco’s project was not a success nor fail, improvements can be made in different aspects which would be organization, assessment topic, and work environment. These three recommendations are a good start to change for the future of the Mathematician Method that would create a more successful outcome.

The worksheet that Orozco created needed to be better formatted. There could have been a table given for students to neatly put in their answers, like students had done on their own. Along with organization, if students were only allowed to use five colors for their design it would have been a better lead for them to work. This is a recommendation because while observing what the students were doing, the answers were done in a messy manner for the limited space given to them.

The next recommendation Orozco has would be to only assess one part of the worksheet at once. For example only assess decimal points or only assess fractions. This would make it easier and less stressful for the students to do the work without confusion. Orozco believes if the students were assessed with shorter topics, they may achieve at a higher rate.

The last recommendation would be to push for the students to work silently with a time limit. The students had 45 minutes to complete a design with the answers, but because it was fun and a new teacher was teaching they quietly talked amongst themselves. This created more distractions and since they were coloring Orozco wanted to observe what worked and what did not for her worksheet.

**Future plans to build on the capstone**
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In the future, Orozco is aiming to be an elementary school teacher, and no matter where she teaches, she will be required to assess her students with the standardized testing. Aside from the standardized test, Orozco hopes to lean away from multiple choice testing, and gear more towards a more modern way of testing.

The first way Orozco would build on her Capstone Project is to keep finding new ways that work to assess her own students. This will be done through trial and error just like the Capstone Project was done. Other ideas she had was to have students create a portfolio and assess the portfolio, or to have students use the lesson in everyday life and assess that. Verbal explanation may possibly another great idea to assess students.

The next way Orozco will build on her capstone would be to have the opportunity to teach students who will have to take the standardized test. Orozco has not had the chance to teach students for a year in preparation of taking the standardized test, so that will create a connection to experiencing the standardized test first hand. With that she can build on creating an alternative method for her future students.

Conclusion

The Capstone Project was created with the question of “how has standardized testing affected low-income communities?” This pushed for the next step of how Orozco determined what a quality education was, with what students were at risk of academically achieving lower than other students with a more fortunate socioeconomic background. The findings was that students who lived in low-income areas are testing lower in the yearly standardized test. Orozco felt that this was a huge issue that only is worsening low-income students future to achieve academically. She felt that change needed to be implemented therefore she created her project.
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Orozco wanted to create an alternative assessment method with keeping in mind what students enjoy, and what stresses them out. After speaking to the lead teacher, she explained the dynamics of her students about the stress levels they had. Therefore, the Mathematician Method was created. The Project section of the Capstone Project was determining if the method worked as well as if it was a good alternative. Overall, the standardized test is an outdated way to assess a mass of students quickly and efficiently, which does not always mean the best way to do it. Orozco wanted to find the best way to help future students not only in low-income neighborhoods, but students everywhere.
How has standardized testing affected low-income communities?

References

“A Nation At Risk.” *Home*, US Department of Education (ED),


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doi:10.1037/e492152006-011


Retrieved May 5, 2018, from Project MUSE database.

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APPENDICES

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APPENDIX B: TEMPLATE
APPENDIX C: STUDENT 1
APPENDIX D: STUDENT 2
APPENDIX E: STUDENT 3
APPENDIX F: STUDENT 4
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APPENDIX A: LESSON PLAN
Mathematician Method

Lesson Overview

1. Subject Area: Mathematics

2. Topic: Fractions and decimals

3. Grade: Fourth-Grade

4. Measurable Learning Objective: Students will formulate an image on a 10 x 10 grid that represents a fraction and decimal.

5. Summary of Lesson: Students will use the mathematician method, where they will first color in a 10x10 grid, and then identify the fraction that corresponds with the color. After, they will then change the fraction and turn it into a decimal.

Implementation

In the fourth grade, students learn fractions and decimals. Orozco’s lesson will help assess the common core standard of using decimal notation and fractions, and compare fractions to decimals. What would come first within the lesson would be how fractions are done. After the students got the concept of fractions, we would move to decimals. By grade 3 students should know how to compare fractions with each other to see if they are equal, greater or less than one
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other. They should also be able to know fractions on a number line as shown on the common
core standards website for third grade mathematics,

http://www.corestandards.org/Math/Content/3/NF/.

The lesson that Orozco would start off with is going over what students should have
learned in the third grade. Then introduce decimals being equivalent to fractions. Orozco would
do this by showing things out of 100 because a decimal out of 100 would be easier to physically
see the equivalence with. The lesson Orozco created is essentially an assessment of what we
would go over in class based on a 10 by 10 square. The students should be able to know what the
square is and they will create a design on the square where they will identify the color to its
fraction, and with that information they will turn the fraction into a decimal. This will show that
students can do CCSS.MATH.CONTENT.4.NF.C.6. When the assessment is complete Orozco would
then teach on fractions with different denominators that are not 100 that can be turned into a
decimal so it would be the next step with the same idea.

The assessment should essentially take 25-45 minutes to complete. Orozco believes the
longest part of the assessment would be the coloring portion because students like to color and
How has standardized testing affected low-income communities?

the assessment allows for design creation. Strategies used will be student will work alone and if
the have questions, answer them without giving them the answers.

**Procedure**

The assessment will be introduced by going over what is expected of them. What makes it interesting for the class is that they get to create their own designs within a 10 by 10 square and that is what makes it fun. First, Orozco will go over the assessment by showing an example and going over the worksheet. The method Orozco will use is “I do, we do, you do” so after Orozco does the example the class will do one together, and after do it themselves which would be the assessment. During the assessment students should be working independently, and may ask questions when need be. Orozco will wrap the lesson up by going over each students work to look at each of the designs and how they all differ. A follow-up will be done that is done through grading the assessments to see where each student is at and can tell if the student needs extra time and help with fractions and decimals or if the teacher can continue to learn the next lesson.

**Materials and Resources**
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The materials needed for the assessment would be a worksheet that Orozco would provide, color (pencils, crayons or markers), and a pencil. Provided on the projector screen will be instructions that each student can look up because the worksheet would not be able to fit each direction.

**Standards & Assessment**

The standards that are being assessed on is CCSS.MATH.CONTENT.4.NF.C.6. “Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.” This is Grade four mathematics on understanding decimal notation for fractions, and comparing decimal fractions. A Rubric Orozco created will be how students are assessed which includes completion, accuracy and creativity.
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**Rubric**

<table>
<thead>
<tr>
<th></th>
<th>4 Above Average</th>
<th>3 Average</th>
<th>2 Needs Improvement</th>
<th>1 Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completion</strong></td>
<td>Student completed the assignment, and went above what was asked for (ex: reducing fraction).</td>
<td>Student finished assignment.</td>
<td>Student did part of assignment, but did not complete it.</td>
<td>Student did not do assignment.</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Student got all answers correct, even the reduced fractions.</td>
<td>Student got all answers correct, or missed 2 or less.</td>
<td>Student missed three or more answers or did not fully write every fraction and decimal.</td>
<td>Student did not give any answers.</td>
</tr>
<tr>
<td><strong>Creativity</strong></td>
<td>Student used more than 6 colors and is neatly done.</td>
<td>Student used 3-5 colors and is neatly done.</td>
<td>Student used 2 colors and is messy.</td>
<td>Student used 1 color.</td>
</tr>
</tbody>
</table>
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APPENDIX B: TEMPLATE
How has standardized testing affected low-income communities?

Step 1: Shade in the squares.
Step 2: Write down each color you used.
Step 3: Write down the fraction that you used in each color.
Step 4: Turn your fraction into a decimal.
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APPENDIX C: STUDENT 1
How has standardized testing affected low-income communities?

<table>
<thead>
<tr>
<th>Color</th>
<th>Fraction Form</th>
<th>Decimal Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>red</td>
<td>$\frac{24}{100}$</td>
<td>0.24</td>
</tr>
<tr>
<td>orange</td>
<td>$\frac{29}{100}$</td>
<td>0.29</td>
</tr>
<tr>
<td>yellow</td>
<td>$\frac{24}{100}$</td>
<td>0.24</td>
</tr>
<tr>
<td>blue</td>
<td>$\frac{24}{100}$</td>
<td>0.24</td>
</tr>
<tr>
<td>purple</td>
<td>$\frac{24}{100}$</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Orozco, M. (2019). *Student 1*
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APPENDIX D: STUDENT 2
How has standardized testing affected low-income communities?

How has standardized testing affected low-income communities?

APPENDIX E: STUDENT 3
How has standardized testing affected low-income communities?

How has standardized testing affected low-income communities?

APPENDIX F: STUDENT 4
How has standardized testing affected low-income communities?

Orozco, M. (2019). Student 4
How has standardized testing affected low-income communities?

APPENDIX G: ADDITIONAL STUDENTS WORK
How has standardized testing affected low-income communities?

<table>
<thead>
<tr>
<th>Color</th>
<th>Fraction Form</th>
<th>Decimal Form</th>
</tr>
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<tr>
<td>Red violet</td>
<td>21/100</td>
<td>0.21</td>
</tr>
<tr>
<td>Red</td>
<td>13/100</td>
<td>0.13</td>
</tr>
<tr>
<td>Blue</td>
<td>8/100</td>
<td>0.08</td>
</tr>
<tr>
<td>Turquoise</td>
<td>12/100</td>
<td>0.12</td>
</tr>
<tr>
<td>Light purple</td>
<td>4/100</td>
<td>0.04</td>
</tr>
<tr>
<td>Pink</td>
<td>19/100</td>
<td>0.19</td>
</tr>
<tr>
<td>Purple</td>
<td>10/100</td>
<td>0.10</td>
</tr>
</tbody>
</table>
How has standardized testing affected low-income communities?
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<table>
<thead>
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<th>Color</th>
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<th>Decimal Form</th>
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</thead>
<tbody>
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<td>Orange</td>
<td>(\frac{6}{100})</td>
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</tr>
<tr>
<td>Gold</td>
<td>(\frac{32}{100})</td>
<td>0.32</td>
</tr>
<tr>
<td>Pink</td>
<td>(\frac{14}{100})</td>
<td>0.14</td>
</tr>
<tr>
<td>Blue</td>
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</tr>
<tr>
<td>Green</td>
<td>(\frac{1}{100})</td>
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</tr>
<tr>
<td>Dark Green</td>
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<td>0.08</td>
</tr>
<tr>
<td>Dark Purple</td>
<td>(\frac{16}{100})</td>
<td>0.16</td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
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<table>
<thead>
<tr>
<th>Color</th>
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<th>Decimal Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purple</td>
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<td>0.34</td>
</tr>
<tr>
<td>Blue</td>
<td>31/100</td>
<td>0.31</td>
</tr>
<tr>
<td>White</td>
<td>5/100</td>
<td>0.05</td>
</tr>
<tr>
<td>Yellow</td>
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<td>0.04</td>
</tr>
<tr>
<td>Pink</td>
<td>9/100</td>
<td>0.09</td>
</tr>
<tr>
<td>Green</td>
<td>19/100</td>
<td>0.19</td>
</tr>
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<thead>
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<th>Color</th>
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<th>Decimal Form</th>
</tr>
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<tbody>
<tr>
<td>gold</td>
<td>(\frac{20}{100})</td>
<td>0.20</td>
</tr>
<tr>
<td>red</td>
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</tr>
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<td>skyblue</td>
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</tr>
<tr>
<td>turquoise</td>
<td>(\frac{1}{100})</td>
<td>0.01</td>
</tr>
<tr>
<td>dark blue</td>
<td>(\frac{1}{100})</td>
<td>0.01</td>
</tr>
<tr>
<td>pink</td>
<td>(\frac{1}{100})</td>
<td>0.01</td>
</tr>
<tr>
<td>black</td>
<td>(\frac{1}{100})</td>
<td>0.01</td>
</tr>
</tbody>
</table>
How has standardized testing affected low-income communities?

<table>
<thead>
<tr>
<th>Color</th>
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</tr>
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<tbody>
<tr>
<td>Red</td>
<td>13/100</td>
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</tr>
<tr>
<td>Orange</td>
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<tr>
<td>Yellow</td>
<td>13/100</td>
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<tr>
<td>Green</td>
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<td>0.013</td>
</tr>
<tr>
<td>Blue</td>
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</tr>
<tr>
<td>Violet</td>
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<td>0.012</td>
</tr>
<tr>
<td>Pink</td>
<td>12/100</td>
<td></td>
</tr>
</tbody>
</table>

- Color distribution: Red, Orange, Yellow, Green, Blue, Teal, Violet, Pink
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