

Data Analysis

For this study, the researchers created two surveys, one for teachers and one for students. This survey took place at WNHS. Twelve of the 13 math teachers that received the survey completed it over the course of a week. A total of 851 students (or 61.7%) participated in the student survey. There were no restrictions on this survey such as gender, age, and language. There were also no rewards or incentives offered to complete this survey as it was completely optional. In this section, the researchers will analyze the data from both of their surveys. When applicable, connections between the data and their Literature Review will be drawn. (*Both surveys can be found in their entirety following the Annotated Bibliography.*)

With the student survey, which was two pages in length and contained 11 questions, the researchers used Questions #1 through #6 to gather background information on the individual answering the survey. These questions were also designed to make sure the students knew the difference between CC and CPM. Questions #7 through #11 were the most important and the ones the researchers tracked the closest. It became very apparent that students do not know the difference between the two. Over half of respondents claimed they were not in a class that used CPM, but their answers indicated that they actually were. The same percentages held true for those that said their class did not follow the CC when, in fact, it did. This gave the researchers pause, but, because it was in line with what they had anticipated before they began their study, they continued their data collection and analysis for Questions #7 through #11.

Question #7 reads: “*How much do you know about Ohio’s transition to the Common Core State Standards?*” This question sought to see if students were aware of the incoming CC curriculum – be it because they read about it or because they were told about it by their teachers. Only 3.4% of students said they had a lot of knowledge about the district and school’s transition

to the CC. Overwhelmingly, 80.4% of students said they had little to no knowledge, clearly indicating that they were blindsided by the sudden CC transition. While this may help explain their confusion between the CC and CPM, it points to the fact that most students are not informed about decisions made concerning material that they will have to learn.

Question #8, which reads: *“I believe that the Common Core State Standards have improved my learning in my math class”*, really got into the heart of the CC debate: the enjoyment of the new curriculum. Only 39.9% of students said that they “strongly agreed” or “agreed” with the statement made in Question #8, while 60.1% of students said they “disagreed” or “strongly disagreed”. Upon closer examination, only 8% of students answered “strongly agree” in reference to liking the new CC, while 32% of their counterparts were adamantly against it (and answered “strongly disagree”). Because this survey had 851 participants, there is a lot of stock that needs to be taken in these answers. This data means that most students believe that the CC has not improved learning in their math class. (Of course, whether the students are blaming the CC or CPM remains unclear since there was rampant confusion between the two.) “Some parents saw that the Common Core was actually lowering the standards in their school” (Gallagher). “Instead of simply teaching students multiplication tables, schools are adopting an inquiry method of learning in which children are supposed to discover the knowledge for themselves” (Garellick). The students at WNHS do not appear to like this “hands-off” approach to instruction.

Question #9 was intended only for those students who answered “Strongly Agree” or “Agree” on Question #8. Question #9 reads: *“Please identify the reasons you believe the Common Core State Standards will benefit students.”* Students were able to select all of the answers that they felt applied. Of the 39.9% that met the criteria in Question #8, 20.6% believe

that the CC will help math teachers better prepare their students for college, 22.2% believed the CC will help math teachers better prepare their students for the work force, 22.6% of students believe that the CC will help teachers focus on what is most important, 12% believe that the CC will ensure that a high school diploma has meaning, and 22.6% of students believe that the CC will provide students a clear understanding of what they must know to succeed. This data means that most students who believe that the CC has improved their learning in math believe that the CC will benefit other students because it will help math teachers focus on what is most important and will give students a clear understanding of what they must know to succeed. “The Common Core is designed to raise achievement levels in public schools across the country” (Arevuo). The new curriculum puts kids in real life situations to better prepare them for life after school. “The developers took what was deemed necessary for success in college and careers beyond high school and back-mapped those skills into standards all the way down through the K-12 mathematics curriculum to primary school” (Felt).

Question #10 was for those students who answered “Disagree” or “Strongly Disagree” on Question #8. Question #10 reads: *“Please identify the reasons you believe that the Common Core State Standards will not benefit the majority of students.”* Again, multiple answers were permitted. Of the 60.1% that met this criteria, 12.8% believe that the old state standards are better than the new CC, 14.7% of students believe that the CC is too tough for many students, 14.7% feel the CC excludes important concepts that students should learn, 32.4% believe that the CC embraces a “one size fits all” approach that does not help, and 25.5% of students believe that the CC does not provide teachers the flexibility to help students that are behind. This data means that most students who disagree that the CC has improved their learning in math believe that the CC will not benefit the majority of students because it embraces a “one size fits all” approach

that does not help. Stanford Professor Milgram said that the standards were “written at a very low level” and “do not adequately reflect our current understanding of why the math programs in the high-achieving countries give dramatically better results” (Gallagher). The CC does not do a good job of making individual thinkers of children (Chiaramonte). “If the new standards adopted by New York and 44 other states work as intended, students will learn less this year” (Chang). The hope is that children understand better. You need the kids to think more (Chang).

Question #11 reads: “*The Common Core State Standards are good for Westerville City Schools.*” The students were supposed to select an answer that they thought best represented their opinion. In the end, 37.2% of students “strongly agreed” or “agreed” with Question #11’s statement, while 62.7% said that they “disagreed” or “strongly disagreed”. The data collected means that the majority of math students at WNHS strongly disagree that the CC is good for Westerville City Schools (WCS).

The data collected from the student survey show that the majority of students strongly disagree that the CC has improved learning in the classroom. They also disagree that it is good for WCS. The dissatisfaction with the CC hinges on its “one size fits all” approach that a majority of students feel does not help them learn. Those that felt the CC was good for WCS felt that the CC helped math teachers focus on what is most important and provides students with a clear understanding of what they must know to succeed.

The researchers also passed out a teacher survey to the Math Department. There were 24 questions, and 12 of the 13 teachers answered the survey. The first question of the survey reads: “*How much do you know about Ohio’s transition to the Common Core State Standards?*” This question was especially interesting since 100% of the teachers polled stated that they have “from some” to “comprehensive” knowledge of the transition. As such, it is apparent that the Math

Department was informed about WCS' intent to implement the CC. A later question asked teachers how prepared they felt to teach CC. While every teacher felt prepared to some degree, 81.8% stated that they were "somewhat" prepared. Teachers that did not feel overwhelmingly prepared said they would have been more prepared if they had access to curricular resources aligned to the CC, access to assessments aligned to the CC, and if they had been given more information about the change in standards and what is expected of students. Eighty percent of teachers said they accessed various district and state websites to track down additional information and materials for CC, but 22% found these websites to be helpful. This is intriguing because when later asked which source of CC information teachers trusted the most, the State Department website ranked as the most trustworthy source (by 23% of respondents) despite the fact that 66% said a fellow math teacher in the building is considered to be an "expert" on the CC. (Only 19% saw this peer math teacher as the most trustworthy source of CC information.)

The crux of the problem is the training teachers received for the CC and CPM. When the amount and quality of Professional Development (PD) is examined, 100% of teachers polled said they had attended some PD concerning CC at some point over the past year. However, only 10% strongly agreed that they had been proficiently prepared, while 40% strongly disagreed. This means that most teachers felt that they did not receive quality training and have had to learn a great deal of information on their own. This connects to the findings by Edward Frenkel and Hung-His Wu that said because teachers have never taught using the new CC curriculum, they will not have time to learn how to teach by the new standards. This problem is compounded by the fact that there is a huge rush to implement CC to school systems across the country (Frenkel and Wu).

Of the teachers that responded, 33.3% answered that they had fully incorporated CC and CPM into their teaching expectations and practice, 25% had incorporated the CC and CPM into some area of their teaching (but not fully in others). A third of respondents said they have not implemented it while, interestingly, 8.3% said they did not know if they had implemented the CC and CPM into their classrooms. Of the 58.3% that have implemented the CC and CPM (whether it is fully or partially), 23.7% have incorporated new curricular materials and instructional strategies into their teaching, 23.7% find themselves asking their students more questions and encouraging them to develop their answers independently, 21.2% have increased their collaboration with colleagues within the school or in other schools, and 10.5% are diversifying the ways they assess student learning and provide feedback.

Specifically, Question #3 states: *“I believe that the Common Core State Standards will lead to improved student learning for the majority of the students I serve.”* For this question, teachers were supposed to mark the answer that best reflected their opinion. Of those that answered, 66.7% agreed to some extent with that statement, while 16.7% remained undecided. This means that most teachers agree that the CC will lead to improved student learning. Those that agreed were then asked to select from a pool of answers all that they felt applied. Overwhelmingly, 90% said that the new CC will help teachers focus on what is the most important material in the curriculum. (This is particularly interesting when comparing it to the student survey. The students that believe the CC is good for WCS felt that way because they see the CC helping math teachers focus on what is most important and provide their students with a clear understanding of what they must know.) Strangely enough, only 14.3% of teachers felt the CC would help teachers better prepare students for college. The teachers that disagreed with the effectiveness of the CC answered a follow-up question and selected as many answers as they saw

fit in the same fashion as those that agreed did with their follow-up question. None of the teachers felt that the CC was “too rigorous”, yet, 40% (the highest percentage of respondents) felt the issue with the CC was that it embraces a “one size fits all” approach that will not help as many students.

In further dissecting the impact of the CC, teachers were asked to what extent they felt specific practices were important to improving student learning. The answer options were in a chart, and teachers had to select all that they felt applied. The survey results found that 62% of teachers thought structuring class time for student so they can develop procedural skill and fluency in core operations (such as multiplication tables) in order to get them to understand more complex topics was important. (Interestingly, 38% said this was not important.) This shows a great rift in the perceived importance of core operations in the eyes of the Math Department. Sixty-three percent thought exposing students to a wide range of math topics within each grade level in order to prepare them for their future learning was important. (Ironically, this contradicts the fundamental idea of CC.) Connecting student learning within and across grades so learning builds on a foundation built in previous years was deemed important by 100% of teachers polled. When it came to applying what was learned in the classroom to “real world” situations, 100% agreed that this was important. This connects to Felt’s findings that across the United States, less than half of students were registering as “minimally proficient” in math. It is Felt’s opinion that this should change because students are working towards a broader understanding of the subject. The old curriculum was about skills and plugging in formulas rather than thinking and getting a deep understanding (Felt). Lastly, maximizing student learning by teaching effective mnemonics and recall strategies as alternatives to conceptual understanding was embraced by only 21% of the staff while 79% found little to no importance in this particular skill set. The data concludes

that most teachers think the top two challenges to successfully implementing CC and CPM in their school are the prior knowledge of their students and additional time to help students become familiar with the CC and CPM approach to math.

The results of the two surveys paint an interesting image concerning the state of mathematics at WNHS and for WCS. The data shows a great divide between the students and staff. A majority of students do not like the CC and do not think it is good for WCS, whereas almost all of the math teachers like the CC and think it is good for WCS. Such polar opposites suggest that more time is needed with the CC to see how it plays out over the course of an entire graduating class and, perhaps, the manner in which the CC is delivered (via the CPM method) needs to be re-examined.