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The Effects of Using iPads to Increase Basic Math Fact Automaticity

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An Action Research Report

By Kyle Shaughnessy and Nicholas Sunderman

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Abstract

Our investigation was on the effects of using iPads to increase basic fact automaticity. We wanted to explore what strategy worked best to increase fact fluency: flashcards and paper/pencil practice or iPad practice. The project took place in one fourth-grade classroom and one fifth-grade classroom. The fourth-grade classroom had twenty-one students. The fifth-grade classroom had twenty-two students. We collected data with pretest and posttest instruments. We also collected data through weekly observations. Students using the iPads were also monitored using the Moby Max fact fluency program. The results indicated that daily flashcard and paper/pencil practice provided a higher rate of improvement of fact fluency on a two-minute test. We concluded that although the data does not indicate a higher rate of improvement by using iPads, other factors must also be included. One important factor was that the students who showed the greatest improvement also happened to be in the fifth-grade classroom. The implication for us is that we will use a combination of iPad practice along with the flashcard and paper/pencil review to increase student mathematics fluency.

Automaticity can be defined as having the ability to complete a task with little or no time spent thinking about it. By promoting basic mathematics fact automaticity, teachers are giving their students the tools needed for higher-order thinking. The lack of basic math fact automaticity has come to the forefront as students are thrust into the upper elementary and, regardless of differentiation, struggle with the higher-order thinking that goes along with the mathematical concepts being taught. Through the mastery of basic math facts, students are able to use their working memory "for higher-level problem solving" (Ezbicki, 2008, p.21).

As students climb the instructional ladder from addition to division, it has become evident that students who lack the knowledge and fluency of basic math facts can often fall behind their peers. In our district, Minnesota Comprehensive Assessments (MCAs) and Measures of Academic Progress (MAP) show variances in the areas of computation and algebra. These are two areas that are greatly affected by basic mathematical knowledge and basic math fact automaticity. As students are exposed to high-level mathematics problems that include higher-order thinking, they can often become overwhelmed as it puts high demand on their memory and does not allow their brains to function as efficiently as those who have developed basic fact automaticity at a younger age.

From our experience, we believe that math fact fluency has a strong effect on general mathematical understanding and that fact automaticity is crucial for success in problem solving in mathematics. Through the use of iPads and applications we hope to

give the students an opportunity to practice their basic math facts and, in turn, increase their knowledge and confidence in mathematics.

According to the National Mathematics Advisory Panel, "Children in this country cannot solve single-digit addition, subtraction, multiplication, and division problems as quickly or efficiently as students from other countries" (Codding, Burns, & Lukito, 2011, p.1). In order to close this gap and give our students the best possible opportunities for success in mathematics, we feel technology is the tool that is missing that will assist us in this endeavor. For ages instructors have pursued techniques to improve achievement in mathematics, and research has shown high levels of effectiveness in increasing math fact fluency through the use of technology. Students will increase fact automaticity when they are stimulated with an engaging task through games, music, and manipulatives (Thomas, 2005).

Aside from the need to enhance our instruction and increase student practice, there is the added element of excitement for the students. The addition of iPads and other technologies in the educational setting has led to instruction that promotes learning and paves the way to intrinsic motivation for the students. One study found that "11% of gains by elementary school learners in mathematics were directly attributable to technology usage" (Burke, 2013, p.59). Jennifer Reynolds (2010) also found through her research that using computerized math interventions did increase fact fluency for all of her students.

The students involved in this study from the fourth-grade classroom consist of twenty-one students. There were eleven girls and eleven boys included in the study. Four

of the students included were English language learners. One of the ELL students is labeled “new to country” and does not speak any English. There were no special-needs students included in the study.

The fifth-grade students in the study were made up of a wide variety of students. Of the twenty-two students, thirteen were boys and nine were girls. Five of the students were identified as ELL learners, and three of them had already tested out of ELL according to the ACCESS tests. At the time the paper-and-pencil/flashcard interventions took place, all of the students in special education were out of the classroom for math services. Learning levels of the fifth-grade learners in this study ranged from lower-level third grade to seventh grade levels according to MAP testing done in September.

Specifically, we want to answer one important question: What are the effects of using iPad applications on the automaticity of basic mathematics for fourth- and fifth-grade learners? With the current shift in academics pushing toward technology, we want to embrace the use of iPads and give our students the opportunities to increase their knowledge of basic math facts. Our research and data point to the fact that many academic gains in schools implementing technology can be directly attributable to the use of that technology.

Not only do we intend to increase student knowledge and enhance their higher-order thinking skills along the way, we hope to give our students the best possible ways to succeed in mathematics. Along with practice and motivation comes confidence. Students that feel confidence in mathematics are much more likely to succeed and enjoy mathematical problem solving that students without.

There is no doubt that initial instruction of the concepts and guided practice during the scheduled class time is essential. However, the use of iPads is sure to add an element of instruction that many have yet to experience in their classrooms. Whether the iPads serve as tools to increase student participation and practice time or to motivate a struggling student to practice, they are sure to give educators access to the wonderful world that is technology. There are so many great tools out there; it is time we start taking advantage of them.

Description of Research Process

There were a variety of options we considered when we began the discussion of implementing technology in our classrooms. With the recent influx of iPads in our district, we felt the iPad is the best option for this study. We intend to implement a fact mastery program using 15 iPads in each of our classrooms. We will provide a pretest and posttest that includes addition, subtraction, multiplication, and division to our fourth-grade and fifth-grade classes. The students in our study will then be given a Moby Max account that they can access both at school and at home, along with other mathematical applications that involve basic math fact instruction and practice. Researchers suggest a minimum of three minutes each day to practice fact automaticity (Knowles, 2010, p. 50). Students will be given a minimum of 10 minutes per day for four out of five days of the week to develop their fact skills using the iPads in the classroom.

The students will be given schedules that will include when they are to practice on the iPads. The iPads will be strategically located in the classrooms in areas that will not affect the learning of their peers. The other classroom teachers will continue using our

current math curriculum without the implementation of the iPads. After two months we will administer the posttest and analyze the results. The results will be scrutinized extensively to find what impact, if any, iPads had on the students' fact automaticity.

Our action research will begin with a pretest to establish the first part of our artifact data. Students will be tested on their mathematics fluency skills for addition, subtraction, multiplication and division. We decided to use the AIMSweb program's "All Basic Facts Probe." The AIMSweb program is a progress monitoring system designed for K-8 students. The basic facts probe specifically addresses fluency needs of the students. The AIMSweb program follows the RTI process and creates tiers for teachers to follow. Alongside the Moby Max results, the probe scores will also be used to place the students into strategy groups to help with the mathematics instruction process.

The probe requires the students to answer as many basic math fact questions as they can in two minutes. Students are instructed to go in order, from top to bottom/left to right and try each problem. If they are unable to answer a problem after a few attempts they simply put an "X" through the problem and move on to the next problem. Each answer has different values. A one digit answer is worth one point and a correct two digit answer receives two points. However, no partial points will be awarded for writing part of the correct answer. If a probe is turned in and it is obvious the students has skipped through the probe to answer the easiest problems to get maximum points, the student will be required to retake the test at a different time.

Upon completion of the "All Basic Facts Probe," all students will receive a Moby Max user account. Information about the Moby Max online program will be sent to the

students' parents/guardians in the form of an informational flyer. The flyer will include basic information, login information for their child, and instructions on how to access their child's progress and information. Students first will take the placement test. The test takes roughly thirty minutes. The test uses the math common core standards. Once students complete the placement test the Moby Max software identifies what specific skills the students need to work on. Students then will work on the fact mastery portion of the Moby Max program. The Moby Max fact mastery program is designed to work on specific mathematics facts that a particular student may need more help with.

Before students begin their basic mathematics fact fluency practice for the first time, six students from each class will be given a short survey to discuss their thoughts about using the iPads to increase their fact fluency and skills in mathematics. Students will also be surveyed on their past experiences using the Moby Max website. Surveys will be collected and stored to compare with the exit surveys given on the last day of the study.

Students will practice their math fact fluency for a minimum of 15 minutes per day using their Moby Max account on the classroom iPads. After the first week of practice, the students' fluency progress will be graphed with the help of the Moby Max computer program. Each graph will be shared and discussed with students. We will discuss progress and strategies that will further the students along in their fluency development. We will also be sending graphs home to the parents to share student progress.

Week two will be similar to week one. Students will continue to use their Moby Max accounts on a daily basis. We, as teachers, will create small strategy groups to discuss other ways to increase their fact fluency. Students will also be given the opportunity to practice their fact fluency using iPad applications and games. One particular game they will be using is “Math Zombies.” Math Zombies is a free application that allows the students to select one particular skill to practice at a time. Students select from addition, subtraction, multiplication, or division and work their way through the game passing levels. The students are given roughly fifteen seconds to answer a particular fact question. As the students progress through the levels the questions become more difficult. Math Zombies, as well as other selected mathematics applications, provide alternative practice opportunities for students that take them beyond their fifteen minutes of practice using Moby Max.

During week three the students will continue to use the Moby Max program on the classroom iPads. Students will discuss their progress with their teacher throughout the week. On day two of week three the students will be asked to create a personal fluency goal for the final two weeks of the program. Students will create a smart goal using the guidelines our school created. They will insert their individual mathematical fluency goals along with a plan on how to reach their goals.

On the final day of week three, results will again be graphed and examined by the teacher, students, and parents. We will then meet with the students and discuss progress and any concerns or problems they faced during the week on Moby Max and other mathematics applications. Based on the weekly results, strategy groups will be modified

as needed to increase mathematics fact fluency. Some parents may be contacted to ensure graphed results are being sent home and examined.

The first three days of week four will be similar to weeks two and three. On day four, the graphed results will again be collected and examined. We will send results home with the students and expect that they will share their results with parents. A signature will be requested on the Moby Max graphs to ensure parents have seen the week's results. Graphs that are not returned with signatures will be noted and parents will be contacted via email or phone calls to discuss progress.

The final day of week four will include the posttest. Students will be given another probe from the AIMSweb program. The procedure will be the same as the pretest. Students will be tested using a different probe than the one that was used for the pretest. The questions will include addition, subtraction, multiplication, and division. The posttests and pretests will be analyzed and compared.

The students who were surveyed at the beginning of the project will again be surveyed. The same survey will be used once again. Survey questions will address their thoughts on using Moby Max as a method to increase basic mathematics fact fluency. They will share whether or not they prefer the Moby Max program to the traditional paper and pencil methods. Surveys will be collected and results will be analyzed. Students will also share their smart goals with their teacher and parents. We will discuss why they reached their goal or why they were unsuccessful. We hope that students will continue to use the program in the classroom and beyond.

With the goal of improved math fact fluency in mind, we felt it was important to implement the study and look closely at the improvements made through the use of technology versus paper-pencil methods of math fact practice. In the next section of this study, you will find the data that was collected and an analysis of our findings.

Analysis of Data

We used a variety of data resources throughout our action research project. We relied on the AIMSweb system to help analysis our data. Students were administered an "all fact" fluency test at the beginning and end of our study. We then created an excel spreadsheet of all student data. We identified individual student growth, overall class growth, and discovered whole class average growth. Along with the excel spreadsheet we provided each individual student with a "rate of improvement goal." We used the following formula: (Number of weeks x 1.6 ambitious rate of growth) + first correct score taken = student goal. Student data were then uploaded on the AIMSweb software and provided us with another form of data to examine.

The AIMSweb assessment used at both fourth- and fifth-grade levels was a 2-minute assessment (see Appendix A). We added up the correct answers to each assessment for each student in both classes. The data were quite revealing and equally intriguing. The pre-assessment and post-assessment included basic addition, subtraction, multiplication, and division that have proven imperative to student understanding of the concepts being presented in both fourth- and fifth-grade state standards.

In the fourth-grade classroom, iPads were used to implement both the Moby Max individualized mathematics program and applications from the Internet that address math fact fluency. Students practiced their basic math facts through the use of the iPads and worked their way through the programs and applications on the iPads.

On average, students improved by 9 points from the pretest to the posttest. Students have shown great improvements throughout the study. Through reflection in the class surveys (see Appendix B), there is high motivation in using the iPads and the students express that iPad usage is inspirational and beneficial to the students as a whole.

Table 1

Fourth Grade Classroom Pretest and Posttest Results

Students	Pretest	Posttest	Outcome +,-
J.A.	9	11	plus 2
G.B.	7	9	plus 2
S.B.	7	9	plus 2
A.F.	9	15	plus 6
B.F.	13	36	plus 23
H.F.	25	38	plus 13
J.G.	24	33	plus 9
A.G	33	54	plus 21
M.K.	9	9	0
B.M.	25	22	minus 3
C.M.	11	13	plus 2
J.O.	25	40	plus 15
S.P.	7	16	plus 9
T.R.	50	64	plus 14
B.H.	17	30	plus 13

B.S.	17	12	minus 5
C.S.	38	47	plus 9
B.S.	49	75	plus 26
M.S.	12	8	minus 4
A.V.	10	44	plus 34
D.W.	25	34	plus 9
Average	23.1 correct	28.7 correct	plus 5.6 correct

The iPad fluency results are listed in Table 1. Initials were used in place of actual student names. The pretest and posttest data was collected to demonstrate growth throughout the four-week study.

In the fifth grade classroom four students who did classroom math work and flashcards that did not include practice using the iPad applications and programs. Also implemented on a daily basis was a 1-minute basic math facts test called Super Speed Math. The test was given at each student's individual level. Upon analyzing the assessments each day, the assessments are adjusted and administered to the students to fit their individual needs the following day. As students progress through the program, they work their way from addition to division using a paper and pencil method that Kyle felt has had a positive impact on my students' comprehension of basic mathematics facts throughout the past few years.

In the fifth-grade classroom in this study, Kyle had nine students that started on the Moby Max / iPad applications program, so twenty-two fifth-grade students were used as comparative data for this study. On average, the students in the fifth-grade class improved from 23.5 problems correct per two-minute assessment on the pretest to 33.7

problems correct on the posttest. That is an average of 10.2 more questions correct per assessment.

Table 2

Fifth Grade Classroom Pretest and Posttest Results

Students	Pretest	Posttest	Outcome +,-
K.H.	33	44	plus 11
G.A.	15	26	plus 11
K.B.	42	58	plus 16
K.S.	33	27	minus 6
K.L.	17	24	plus 7
D.G.	30	38	plus 8
C.O.	7	12	plus 5
C.B.	13	31	plus 18
D.W.	14	27	plus 13
S.G.	41	60	plus 19
J.L.	23	29	plus 6
B.R.	39	51	plus 12
G.S.	39	50	plus 11
G.M.	42	63	plus 21
Y.B.	13	18	plus 5
D.S.	23	27	plus 4
H.R.	11	29	plus 18
J.P.	19	34	plus 15
I.S.	19	36	plus 7
Z.S	24	30	plus 6
N.R.	8	12	plus 4
D.D.	12	15	plus 3
Average	23.5 correct	33.7 correct	plus 10.2 correct

In order to better analyze our data, we used graphs and goals provided by AIMSweb. The graphs provide another way of looking at student growth throughout the study. The students' data from the 2-minute tests is formatted into a graph showing trend data. Based on student pretest results the graph provided a correct digit trend using the formula provided by AIMSweb. It also provided an exact number of digits each student should gain on a weekly basis to meet their particular goal. We found growth for students in both grade levels were at or above the desired growth rate.

Following the pretest we also meet with each individual student to help create an individual smart goal. We discussed their pretest results and used the AIMSweb formula to create a goal for students. The students then wrote down how they plan to achieve their goal. After the posttest we again met with each student and discussed his or her progress. Together we came up with an individual strategy to continue their growth.

We were very intrigued by the data that were collected during our study. Our hypotheses were that the online programs would be much more beneficial to the students in the study. We actually found that the students who were presented with the basic math facts practice through paper-and-pencil methods did just as well, and in many cases better, than students using the online mathematics programs to enhance math fact automaticity.

We must be cautious regarding these results, as they are only representative of the end result, and not the motivation that leads up to the final numbers. The students using the iPads expressed their desire to practice daily by playing the games and practicing on Moby Max, while the fifth-grade students using the paper pencil practice in this study

often showed signs of “dread” when presented with the daily practice with basic math facts.

While the upper-tier students showed moderate gains using the paper-and-pencil Super Speed Math, most students showed great gains in comprehension of their basic math facts using both methods. Both methods displayed respectable overall gains from pretest to posttest. Seven students using the online program showed gains and ten students using paper and pencil practice showed gains.

It was evident through student goal setting that students were well aware of their achievements and growth in both grade levels. In Nick’s fourth-grade class, his goal setting led to self-awareness that they were pushing themselves to move up in the levels within the Moby Max Program. In Kyle’s fifth-grade class, the goal setting was taken to another level when they were required to master different “levels” of the paper-and-pencil method before they could move on. While a few students expressed frustrations when they did not meet their goals, it certainly led to more extensive studying and focus on the flashcard practice that was provided daily. We observed that students can be much more self-aware and self-motivated than they often get credit for. We have simply given them the opportunity to do so.

Our efforts in exploring the effects of iPads using Moby Max and Mathematics applications, in particular have opened the floodgates to reaching students on their individual levels. The results we found were encouraging in both grade levels, using both methods of interventions. It has certainly opened our eyes to the fact that while

technology is great, paper-and-pencil and old-fashioned flash cards have also held up to the test of time.

Action Plan

The results that we analyzed were quite eye opening. The overall effectiveness of using technology to increase basic math fact automaticity, while not as effective as we hypothesized, showed positive outcomes for the majority of the students. Differentiation must be considered in both the content that is being presented and the means of which the students practice it.

Recorded results would leave one to believe that paper-pencil methods are the most beneficial, but in seeing the intrinsic motivation students through the use of basic mathematics fact practice on the iPads, we politely disagree. We will continue both mediums with all students, especially our students struggling with their math fact automaticity. While iPad/online benefits are obvious, it is quite apparent that paper-pencil methods, while considered "boring" and "monotonous," are also quite beneficial.

What works for some students does not work for others, and technology use is no different. Some students thrived by using the iPads and have shown great interest and motivation in using them. We did notice that there were also students in the study that enjoyed using flash cards and doing the 1-minute practice timings. In addition, while there were positive results in both areas of this study, the most overall success came from the basic math facts practice not involving the technology.

Our research shows that flashcard practice does work for students at a relatively proficient rate. The online practice also provides student growth but does so at a lower

proficiency rate. We are going to take a more balanced approach to fact fluency in the future. We know that motivation is also an integral part of student growth. By allowing students to practice fact fluency using the iPad we allow some excitement in fact practice that keeps them focused for at least a short duration of time. We also like the computer generated feedback that students receive immediately following their practice. The iPad feedback allows students and teachers the opportunity to discuss progress and address student needs. Using the Moby Max program students can print off a specific fluency area and share with parents their progress and areas of need.

We do not feel that the students' results should be taken to definitely show that the flashcards are the best option. One concern that students discussed in using the Moby Max program was the challenges of using the iPads to practice their fact fluency. The students would first log on to their account using an internet browser. After the students logged in they would select fact mastery. The students found it inconvenient and sometimes too difficult because they would have to begin each new question with selecting the numbers keyboard on the bottom right corner of their iPad before answering each question. Students are only given ten seconds to answer each question before it is considered wrong. We contacted the Moby Max company and they shared with us that the Moby Max application would be available soon.

Because of the difficulties many students had with their fluency practice we also provided them with some additional application options to choose. We found that many of the other applications were enjoyable for the students. However, the online applications became hard for us as teachers to see their growth and progress because they

simply answered questions and moved on throughout the game. There was no means of collecting the students' progress in the applications besides looking at the "level" they got to and discussing their progress and any concerns with them. The students also were not given the amount of differentiation we feel is necessary for success in mathematics.

The flashcard practice and the one-minute timings succeeded in ways that were unexpected. Many individuals can recall doing one-minute timings when they were going through elementary and middle school, and it is not something that we have practiced in our classroom in our district. While it only takes a few minutes per day, it is something that we never looked forward to in our younger years. The monotony of the one-minute timings, paired with old-fashioned flashcard practice are methods that both our higher-functioning students, and our high-needs students were not overly receptive to by the end of the first week of the study.

Whether the students looked forward to it or not, the results speak for themselves. The desire to "test out" of certain areas from addition up through division was enough to continue motivating the students to practice their basic math facts with the flashcards. Our research has shown that using technology and paper-and-pencil methods of practicing basic mathematics facts are effective. One can only hypothesize that a combination of the two will not only be beneficial for the students and teachers alike, it will also increase student motivation and serve as a means of differentiation that will help in all areas of mathematics.

There can and will be a substantial impacts on student learning if we can implement multiple methods of practicing basic mathematics facts each and every day in

the classroom. It was encouraging to see the extent of which students improved by practicing their basic math facts. Different learning methods are needed to reach the wide array of learners that can be found in all grade levels. One method or the other is acceptable, but we believe implementing both would be advisable.

The research we collected really created more questions than answers. We are curious to explore what the leading factor is in student progress. Is student growth generated by motivation? Do well-designed programs produce student growth? Or is student growth created by a combination of motivation and a well-designed program?

We also feel that our study would work best on a larger scale. We would include a variety of grade levels and many more students. Obviously the larger the study the more accurate predictors of achievement we would find. Having the ability to compare results across each individual grade level and analyzing the results would give us clear data that would lead to better instruction all around. Being able to compare results from all grade levels and analyze the data would point our entire school in the best direction for increasing basic mathematics facts automaticity for all students.

Another way we might modify our project would be to compare students at one particular grade level. We compared a fifth-grade classroom to a fourth-grade classroom. Because we focused on individual growth rather than total correct we figured the grade level would not affect our study in any matter. But because fifth graders have had more opportunities to practice fact fluency over the course of their education, this may have led to higher achievement and greater growth on the assessments.

Our study looking into the power of the iPad and the influence it has on student achievement in mathematics has raised more questions than it has provided answers. The conclusion we have come to reflects something we have learned about teaching since our first days in the classroom as educators; there is no such thing as a one-size-fits-all lesson or strategy. It is through differentiation and reaching each student at their instruction level that will promote student growth in mathematics and other curricular areas. A combination of iPad use and the intensive paper-and-pencil/flashcard method may be the technique needed to increase math fact fluency in all grade levels.

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Appendix A

AIMSweb® All Basic Facts #1

Student Name: _____ Grade: _____ Teacher Name: _____

0 + 4	7 - 7	7 - 4	4 - 4	9 x 0	$2\overline{)2}$	5 x 5
11 x 8	$7\overline{)84}$	5 x 2	$6\overline{)6}$	11 x 8	$12\overline{)144}$	1 x 7
9 + 6	10 + 5	9 - 4	8 - 6	9 - 3	6 + 0	8 x 1
4 - 3	8 - 8	$8\overline{)88}$	9 + 2	$5\overline{)5}$	2 - 1	10 - 2
2 + 7	1 x 8	9 + 2	0 x 7	$4\overline{)4}$	12 - 2	6 - 4
9 x 9	$8\overline{)40}$	$9\overline{)18}$	4 + 7	$8\overline{)8}$	6 - 0	9 + 5

AIMSweb® All Basic Facts #1

Student Name: _____ Grade: _____ Teacher Name: _____

$3\overline{)3}$	4 x 1	$2\overline{)8}$	7 - 6	$8\overline{)8}$	9 x 7	$7\overline{)77}$
2 - 0	2 x 2	$4\overline{)36}$	2 x 9	10 + 2	2 - 1	5 + 3
4 - 1	3 x 4	6 + 7	$4\overline{)48}$	0 + 1	4 + 7	11 - 9
1 + 6	9 x 1	$9\overline{)27}$	1 x 1	12 x 2	$5\overline{)10}$	12 - 5
5 + 9	$2\overline{)18}$	11 - 4	$4\overline{)48}$	7 x 7	6 x 0	$8\overline{)40}$
3 x 8	2 - 2	5 x 4	5 - 4	8 x 1	$9\overline{)36}$	$7\overline{)7}$

Appendix B

How comfortable are you using an iPad?	Do you enjoy using flash cards for fact practice?	Have you ever used Moby Max?
Very comfortable	Sometimes when I want to be away from screens I will use them, otherwise not really	Yes
Very comfortable	Fact practice	Yes
Very comfortable	Kind of	Yes
Very comfortable	Not really. I rather use I pads. I will if it is the only thing to practice with.	Yes
I've used one once or twice	I enjoy fact practice better.	Yes
Very comfortable	Yes	Yes
I've used one once or twice	Yes	Yes
I've used one once or twice	Fact pratice	Yes
Comfortable	Yes	Yes
Very comfortable	Yes I am fine with that	Yes
Comfortable	Kind of	Yes
Comfortable	Yes	Yes
Very comfortable	Yes	Yes
Comfortable	No. I like the iPad better	Yes
Comfortable	Yes	Yes
Very comfortable	No	No
Very comfortable	No!!	No
Very comfortable	No	Yes
Very comfortable	Yes	Yes
Very comfortable	Fact practice	Yes
Very comfortable	Not really	Yes
Very comfortable	Yes	No
Very comfortable	No I don't	Yes
Very comfortable	Yes	Yes
Comfortable	No	Yes
I have never used an iPad	Yes	Yes

How long do you practice math facts per week?	How well do you feel you know your basic math facts?
50-70 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
50-70 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
20-50 minutes	I am confident in three of the areas of basic mathematics
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
20-50 minutes	I am confident in three of the areas of basic mathematics
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in three of the areas of basic mathematics
0-20 minutes	I am confident in two of the areas of basic mathematics
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
20-50 minutes	I am confident in three of the areas of basic mathematics
20-50 minutes	I am confident in three of the areas of basic mathematics
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in two of the areas of basic mathematics
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in three of the areas of basic mathematics
20-50 minutes	I am confident in two of the areas of basic mathematics
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in all areas of basic mathematics (addition, subtraction, multiplication, division)
0-20 minutes	I am confident in two of the areas of basic mathematics
0-20 minutes	I am confident in two of the areas of basic mathematics