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A Phenomenology of Homeschoolers' Parents' Experiences of Teaching Mathematics

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A Phenomenology of Homeschoolers' Parents' Experiences
of Teaching Mathematics

by
Melissa Wenzel

A Thesis submitted in the partial fulfillment of
the requirements of the degree of
Master of Science in
Education and Human Development Adolescence Mathematics

The College at Brockport
State University of New York

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Abstract

The objective of this thesis study is to learn and understand more about a topic that is not very familiar to many people. This study will develop a greater understanding of the phenomenon of homeschooling to better understand the experiences of parents who home school. Methods of inquiry include a phenomenological reflection on data compiled from interviews of parents who home school their children, in the Western NY area. There were thirteen participants included in this study total. This inquiry is important because it adds to the body of knowledge in secondary mathematics education. Homeschooling is another method of education in the United States and other countries, and is considered by many standards, a phenomenon. Any information collected about homeschooling direct from the source (the homeschoolers or their parents), illuminates an unknown field of education. Homeschooling is unknown and unfamiliar to many educators, unless they were homeschooled themselves or homeschooled their own children for a length of time. Possibly from this research colloquial school educators will gain insight into different teaching methods, which they can implement in their own classrooms to motivate and better educate students.

A Phenomenology of Homeschoolers' Parents' Experiences of Teaching Mathematics

In 2016 the National Home Education Research Institute (NHERI) estimated that there were about 2.3 million homeschooled students in the United States (US), which was up from 1.7 million in 2012, recorded by the National Center for Education Statistics (NCES), and numbers continue to grow. Clearly many parents are choosing to home school their children today. The purpose of this thesis is to investigate the experiences of parents who home school their children in regards to supporting the learning of mathematics. Lubienski, Puckett and Brewer (2013) stated, "Academically speaking, homeschooled students will outperform their public-school peers, will go farther in postsecondary attainment, and will be more civically engaged and happier than non-homeschooled adults" (p. 381). Critics of homeschooling argue "there is essentially no scientific evidence on the effectiveness of homeschooling" (Lubienski, Puckett & Brewer, 2013). However, Ray (2004) revealed that homeschooled students "scored, on average, at the 65th to 85th percentile on standardized academic achievement tests in the US and Canada, compared to the public-school average of the 50th percentile" (p. 6). In 2014, Ray (2016) also found that college bound homeschooled students scored higher on reading, mathematics and writing (p. 1). Wilkins, Wade, Sonnert, and Sadler (2015) revealed from a 2009 national data set of students in single variable college calculus only 190 out of 10,492 were homeschooled, yet this group of homeschooled students earned significantly higher grades in collage calculus than their peers who attended traditional public school. Many more questions arise from these and other findings.

This research is especially relevant because homeschooling numbers continue to increase and yet little is known about how parents support their children's learning of mathematics in a homeschooling atmosphere. In this research, a homeschooling parent will be defined as having at least taught one of their children at home for a period of time greater than, or equal to, one school year. Homeschooling will refer to the practice of educating children (usually their own) at home or in some type of co-op program, rather than at a public or private institution. This research will focus on parents who have homeschooled mathematics in grades 6 -12 (middle school and high school).

Mathematics can be a difficult subject for students to learn, thus it is important to investigate how parents support the learning of mathematics for their homeschooled children. Are parents struggling? Are they getting help from outside sources? If they are getting help, what type of help? The phenomenological research method was chosen because this method allows participants to share their experiences to advance understanding of a phenomenon that is not well understood. Indeed, there is much that is not known about homeschooling and how parents support each child's learning of mathematics.

Literature Review

Compulsory education dates back as far as 1st century Israel, and therefore is not a new occurrence (Davis, 2011). Yet, homeschooling dates back farther than public schooling in the US. Homeschooling began more like a work study program to learn the skills needed to live or the trade of your parents. The more formal homeschooling we have today has developed over many years and gained popularity because of a book

called, *How Children Fail*, by John Caldwell in the 1964 (Davis, 30). His book went into detail of why schooling children too early can cause problems in the students' current and future education. Davis (2011) reminds readers of all the hard work that goes into homeschooling, but alludes to the many benefits as well. Benefits such as one-on-one instruction and the ability to move at a slower or faster pace without competition among many others (Homeschooling, 2017). Comparatively, compulsory education is defined as a period of educational attendance that is required of all students (US Legal 2016). Currently, in the United States children are required to begin school by age 6 (most begin at age 5), and are required to attend until 14-17 years old depending on the state. In the United States compulsory education was first established in Massachusetts in 1647, and was only grammar school. In the 1850s, compulsory public-school attendance was made law, even though some families would still keep their children home and home school them. Today, students may attend any form of education: public, private, charter, parochial (ets.) or homeschooling, as long as they do between the specified ages of their state, and their learning is reported to the state in some way. This mandated reporting is different depending on the state.

Once considered an anomaly in American education, home schooling has become an increasingly popular alternative to both public and private schools in today's culture. One of the more fascinating aspects of the home-school movement is it is appealing to diverse races, religions, socioeconomic groups, and political viewpoints (Romanowski, 2001). Yet there has always been opposition to homeschooling philosophy. It was found that most of the opposition came from one or more of the following reasons:

1. Parents who homeschool are not qualified enough causing their students to receive lower quality education. The limited studies of homeschooling render uncertainty regarding parents' qualifications to teach their children all subjects, including secondary mathematics (grades 7-12). Addressing this Ray (p. 6) reported that "the typical homeschooling parent has attended or graduated from college. And about half of the home educators have earned a bachelor's degree or higher" (2004).
2. Students who are homeschooled cannot be regarded as an individual outside of the home. Some think that students who are homeschooled are sheltered and have a hard time adjusting to life outside of their family (West, 2009). When they enter the "real world, they face a lot of challenges they were never exposed to before and do not know how to handle them. Those that oppose homeschooling argue "they sometimes feel left out or "not liked" because their family always loved them no matter what" (West, 2009, p.9). Yet Ray (2004) revealed, "Far from being privatized and isolated, home schooling families (today) are typically very well networked and quite civically active" (p. 9). Homeschooled children are socialized a lot in the community and "home school" groups for academics and extracurricular activities (ie sports, music, etc.). Homeschooling extends into the community through volunteering, special studies and events, internships, missionary trips, etc (Thomas, 2016, p 236). The average home school student today interacts with the community on a regular basis. According to Ray, "seventy one percent of the homeschooled 'participate in ongoing community service activities'" (2004, p. 9).
3. Students who are homeschooled may be politically inept or politically disengaged. This is an important issue when considering one of the main goals of the US

education system to prepare citizens to be engaged, self-aware, and live in a democratic society. Ray (2004) presented 76% of homeschooled adults, ages 18 to 24, voted in the 5 years prior to the study while only 29% of the same age general population voted. Also, when responding to the statement “politics and government are too complicated to understand,” only 4% of the homeschooled agree, while 35% of the general population agree. (Ray, 2014, p.9) Lastly, 14% of homeschooled adults ages 18 to 24 also participated in protests or boycotts during the 12 months prior to Ray’s study. This might mean that homeschooled individuals are not political degenerates as opposers might think, but rather civically engaged in their community and political matters (Lubienski, Puckett, & Brewer, 2013).

4. Students who are homeschooled may be at greater risk for unreported and unnoticed physical abuse (West, 2009). Yet it is reported that the abuse among homeschooled students is 40% less than others and child fatalities are fewer than the National Average (Williams, 2017) In the media we only see the extreme cases of abuse, homeschooling or otherwise. The average homeschooling family is vastly different than these “worst situations”. This is not to disregard the fact that homeschooled children can be vulnerable to abuse. According to the United States and local Child Protective Services (CPS) 9.2 out of every 1,000 children were victims of maltreatment in 2012 and of these 46.7% were preschool-age children, before entering school (Ray, 2018).

Methods

Methods of inquiry for this research include a phenomenological reflection on interview data compiled for parents who homeschooled their children, in the Western NY area. Phenomenology is a philosophical method of research that can be explained as a way to investigate one's experiences.

Participants

The individuals studied in this research are from a church community in Western NY, as well as a few individuals outside of this area, but still in New York state, who were referred to by participants. This pool of informants was a great wealth of knowledge with lots of different backgrounds. Snowball sampling was used, which is where a participant already being interviewed was asked if they can recommend or connect the interviewer with another interviewee, out of the original pool of subjects. This did change the original intended community from Western NY slightly. Thirteen participants total were interviewed. This is a good amount as 10 is the golden standard for phenomenology research.

Procedure of Study

To accomplish a phenomenology correctly, the author must put aside their own experiences to fully understand the experiences of the participants. In this study the author set aside their few experiences with homeschooling to investigate the phenomenon without influencing any of the participants. The method used to acquire data will be through a survey questionnaire. During the data gathering a few open-ended questions will also be asked to better "understand the phenomena in *the terms of*

the participant and to allow the essence (of the study) to emerge” (Gronewald, 2004, p 47). Participants were contacted by phone or email to clarify any questions as they arose regarding their responses. Below are the questions posed to participants:

- 1.) What is your name and how long have you homeschooled?
- 2.) What is your highest level of education?
 - a. Do you have any certifications, in what?
- 3.) What mathematics concepts/subjects have you taught?
- 4.) What are the grade levels you have homeschooled?
- 5.) What type of supports have you used for homeschooling?
- 6.) Was there a point in your homeschooling experience that you became challenging or it became difficult teaching your child mathematics?
 - a. If there was, what did you do?
- 7.) From your experience, what have you found most beneficial for teaching mathematics?
- 8.) How do you know your students are succeeding in mathematics specifically?

Results

There was a vast difference in the number of years of teaching among the participants. The average number of years homeschooling were 15, however there were two individuals I interviewed who taught all their children for a longer period of time. One individual taught her children for a total of 25 years and the other a total of 34 years, from the first year of their oldest to that last year of their youngest child. Two individuals interviewed just began teaching their children a few years ago, and only have taught four and five years. Out of the 13 participants, all of them graduated from high school, four had some college, four had earned a Bachelors Degree, two earned a Masters Degree (both in education), and two had a trade (one in early education).

Sumerizing, out of the participants interviewed, the majority of them have an education higher than a high school diploma (80%) and a little less than half (46%) had a Bachelors Degree or higher.

Regarding what mathematics participants had taught when homeschooling, eleven out of the thirteen participants had taught high school and middle school mathematics. The other two of the participants had taught only up through middle school. One because their oldest is just now in middle school, and the other because they send their children to private school when they reach high school age. Out of the parents that had taught their children high school, only two out of the nine taught their children with their own ability using very little resources. Many of the participants got to the point where teaching their children became challenging, so they resorted to different resources. Mostly they would do research in curriculum books or online and sometimes take courses to aid in teaching. Four out of the seven participants who did not teach their students high school math used online programs or college courses. If these methods did not provide enough support then they would seek help from others. Three of the seven participants taught some of the high school math and used a tutor to teach the rest. This tutor was sometimes another homeschooling parent or their own husband, and sometimes the tutor was a paid current or retired math teacher.

There were slight differences in the mathematical content that was taught by the participants. Some of the differences were because they had yet had children at the high school level of mathematics yet. Out of the nine participants who taught their children high school level curriculum, two participants taught the normal high school curriculum up through calculus and one even added a consumer mathematics course.

One participant taught all the same curriculum in public school except pre-calc and calculus. This means their homeschoolers earned the typical Carnegie Units for high school graduation as required in most states: algebra 1, geometry and algebra 2. Two participants skipped trigonometry, statistics, pre-calc and calculus, meaning their homeschoolers learned algebra 1 and geometry content. One skipped geometry, trigonometry, statistics, pre-calc and calculus, meaning the only mathematical content their homeschooler learned was algebra 1. Three participants taught only up to eight grade mathematics or the equivalent and after their homeschoolers took consumer math or dual enrollment in college courses. One of the participants that stopped after geometry supplemented with consumer math and business math for the rest of her child's mathematical schooling. She explained in her description that her daughter struggled with math so she stopped after Algebra 2 and taught something a little more applicable to everyday life. "Math was taking so many hours of the day, that we decided to not pursue any higher levels of math than these". This is a similar reason why most of the participants stopped at a certain level of mathematics with their own children, however not all of them wrote a long description why they stopped at the level they did.

Regarding the types of supports used in homeschooling, the aids in teaching were different for all of my participants, yet there were many similarities. A homeschool group (not always the same one) was used by eleven out of thirteen of the participants as a support for teaching. These homeschool groups were used at different times in the schooling and at varying degrees. Eight out of thirteen of the participants used websites to aid in teaching, while one parent had used online tutoring to raise their mathematical understanding before teaching their child. Similarly, four parents took an online course

to help aid in teaching and six had their students take an online course to learn the material. Two of these six students were of the parents who had taken an online course themselves. All of the parents used some type of curriculum to teach their children. Some could not remember what curriculum they had used, however some of the mathematic curriculums mentioned were as follows: Abeka Academy, Abeka Envisions and Abeka Book, Saxton Math, Teaching Textbooks (which I found out is an online program), Sonlight, Math You See, Timez Attack, Apologia, Times Tales, Brain Quest, ACE, online dual college credit courses, Horizons, Bob Jones Press, and Math US Common Core. The curricula that were mentioned the most were Abeka, Saxton and Teaching Textbooks.

Some of the quotes from the parents that I interviewed regarding what they found the most beneficial for teaching mathematics were as follows. "For me I have found that buying the complete curriculum is a must, especially the solution keys." Another replied, "Once the child masters a concept, I don't make them do all of the problems because I see them growing weary and bored. If a concept is not understood, then I believe much review is effective." One participant addressed, "knowing when it's time to get help. Teaching math is not too difficult for me, but with multiple kids at multiple levels, it becomes a matter of time. So, getting help has been super helpful!" Regarding resources one stated, "There are a variety of resources and you have to find the ones that fits your kid the best." Another addressed, "a variety of curriculums, teaching aids, and online/digital courses. Depending on the student needs and comprehension." One focused on providing good curriculum and stated, "Horizons math laid a great foundation. It does a great job of teaching the concept so it refreshed my memory right

away so I'd know how to help my kids learn easier." One simply replied, "Patience!" Another shared, "I have found most beneficial that my students can function well in everyday situations with the math skills they have mastered. This also includes seeing some of my graduates go on to do very well in college." Yet another shared, "A quality curriculum is probably the most essential part of teaching mathematics. At the beginning, we used a lot of visuals and manipulatives to demonstrate and experience concepts. I felt it was also important to teach mnemonic devices and more than one strategy for achieving solutions to problems. I endeavored to show that math is full of connections and patterns: if one method did not work or was forgotten, there was always another way to find an answer. Giving immediate feedback enables students to learn from their mistakes before building on that concept. (Such timely feedback is much harder to accomplish in a classroom setting.) One-on-one learning allows a teacher to gear the learning to the needs of the student."

When asked how do they know their students are succeeding in mathematics there was a vast difference in responses. Some were just like you would hear in the public-school setting, such as: "Doing well on state testing" or "watching them use these skills daily," Another stated, "fundamental understanding of math in daily life." A different participant replied, "keeping up with daily work and not stressed out." Additionally, one presented, "remembering previous concepts." It was clear that it was important to the participants that their children did well in their schooling. Their explanation of what succeeding is, is just a little more diverse and more individualized to what they value an education is intended for.

Conclusion

“Learning is an activity that children naturally pursue, to make sense of their world” (Guterson, 1992, p 171). It has been said that learning begins at home. Aligning with Gathercole (2007), some respondents seemed to believe that learning should stay in the home. “Whether a child is homeschooled, conventionally schooled, or otherwise, it is the family who is ultimately responsible for the child’s education and socialization” (Gathercole, 2007, p 225). There are many different reasons for families to choose homeschooling. Some reasons include but are not limited to, religious reasons, school environment, curriculum, quality family time, etc. One thing is certain, “homeschoolers come from families devoted to the education of their young” (Guterson, 1992, p. 16). This means that if a child of a homeschooling parent is struggling, they are going to try to give them the best education they can, by any means that they can.

The results show there are similarities and differences between how homeschooling parents homeschool their children regarding the learning of Mathematics. This research included a very small pool of participants from Western New York state, so these results may be different from a different set of participants. Some findings did raise more questions that could be considered in future research. For example, many of the homeschooling parents skipped the upper level math courses, such as Trigonometry, Statistics, Pre-Calc and Calculus. Was this because they did not know how to teach it, or because they did not see a need for these math courses in their student’s future? It does not mean their homeschoolers were not capable of learning those levels of mathematics. Each homeschoolers mathematics curriculum is chosen by parents, based on trajected future endeavors. “Homeschooling parents have a distinct

advantage over public-school teachers when it comes to individualizing education” (Guterson, 1992, p 20). For example, four of the nine participants interviewed that taught high school mathematics to their children, taught mathematical applications the last few years of high school. This seems common among homeschooling parents and some public and private schools are practicing this as well. Mathematical courses that teach life skills such as balancing a checkbook, keeping a budget and how to stay out of credit card debt have real world implications. These skills might be more useful to all graduating students who are going to have to navigate the world on their own after graduation.

In conclusion, as a nation we need to get rid of this “us” verses “them” mentality regarding homeschooling or not (Romanowski, 2001).

“Many public-school teachers and principals view home schooling as a serious threat and take offence at what they regard as personal attacks on their profession and abilities. They see home educators as professionally and academically inferior and accuse home schooling of lacking in social development, classroom-provided stimulation of ideas, and academic and social competition” (Romanowski, 2001, p. 2).

It was found that almost half of the parents interviewed were educated beyond a bachelor’s degree, and many of them had husbands (who sometimes helped with the educating) who were also highly educated. It was mentioned by three of the thirteen participants specifically, that their husbands tutored their children when they no longer could teach the mathematics themselves. Three other participants mentioned getting a tutor, which could have been their husband as well. Educators (parents and teachers

alike) need to be concerned about educating children, however this may look. Teachers and homeschooling parents need to stop seeing the other way of thinking as the enemy and come together to help to educate students whatever way is the best for them. A good way to achieve this goal is by offering dual enrollment courses. Dual enrollment is where homeschooled students can learn their main subjects at home, and then go to conventional school for “specials” (music, art, physical education, band etc.). This arrangement is not only beneficial to the home school students, but the school system as well. The school system can receive financial support from the state for these students even though they are just part time and it would help fund the school as a whole. Also, important, this arrangement creates a sense of community for all parties involved, teachers, parents, administrators, students, etc. When colloquial schools and home school families work together, they begin to see the main educational goal, which is to help every child reach his or her full potential.

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