

# Mathematics Anxiety among GED Recipients in Four-Year Institutions

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## Abstract

This qualitative research study investigated the experiences of GED recipients that impacted their persistence in four-year institutions. The sample consisted of 20 GED recipients enrolled at two (2) universities in South Louisiana. The data collection method used was photography and subsequent photo elicitation interviews. Math anxiety evolved as a recurring theme that impeded the persistence of GED recipients in four-year institutions. A conclusion of the study was that intervention strategies that show students how to cope with math anxiety and be successful at mathematics in higher education should be implemented.

## Introduction

The General Educational Development (GED) Test was originally established in response to the need to help military personnel evaluate their competency levels, since many had not completed high school, and obtain the credentials necessary for further education and professional training. Over time this test became a valid alternative for earning a high school equivalent diploma. Today, one out of every seven secondary graduates each year in the United States earns the GED certificate (American Council on Education, 2000). Many students who enroll in GED programs often indicate that they wish to obtain an equivalency certificate to pursue further educational opportunities (Fisher, 1999; Osei, 2001; Owens, 1989). Research conducted by the American Council on Education (2000) shows that over time, the number of students pursuing the GED to enroll in postsecondary education has increased.

Preliminary research conducted on the GED revealed that college students struggle with mathematics. The American Council on Education (1956) conducted the first major study of the GED Testing program. The higher education component of this study showed that a large number of students admitted to colleges on the basis of the GED Test fared well overall, but the researchers noticed a general lack of preparation in math and natural science. The study concluded that GED recipients should be required to complete special preparation courses before being allowed to enroll in regular college courses in these disciplines.

## Review of the Literature

Many aspects of daily life require some knowledge of mathematics. Knowledge of mathematics and the ability to use this knowledge is critical to the pursuit of many existing and newly emerging occupational fields. Moreover, all undergraduate students are required to take some level of mathematics. If students suffer from math anxiety, their willingness to enroll and succeed in math courses is diminished.

Richardson and Suinn (1972) defined math anxiety as “feelings of tension and anxiety that interfere with manipulation of numbers and solving of mathematics problems” (*Journal of Mathematical Sciences & Mathematics Education*).

in a wide variety of ordinary life and academic experiences” (p. 551). Numerous studies have examined the nature of math anxiety (Viens & Kallenbach, 2001; Woodard, 2002). Bohuslov (1980) stated that math anxiety knows no boundaries of race, gender, age, or other characteristics. Other studies that have explored the effects of math anxiety include Cemen, 1987; Quilter & Harper, 1988; and Tobias & Weissbrod, 1980. Some of the effects of math anxiety included an inability to cope with math at a more than basic level (Quilter & Harper, 1988) and the avoidance of math and math-related careers (Cemen, 1987; Tobias & Weissbrod, 1980).

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## **Theoretical Framework**

The theoretical framework for this study was based on symbolic interactionism. Symbolic interactionism is commonly used in qualitative research. This framework is an approach to discover and understand the meanings of events and how individuals define their realities as a result of those events. The social meanings that people attach to the world around them are of significance in symbolic interaction (Blumer, 1969; Taylor & Bogdan, 1984).

## **Methodology**

This study was conducted at two (2) universities in South Louisiana. The sample consisted of 10 students at each institution selected using snowball or chain sampling. Data were collected in two phases. After a pilot study, Phase I data collection consisted of two focus group interviews with three participants at each institution. For Phase II, 10 GED recipients at each university were engaged in semi-structured, in-depth interviews, photography, photo elicitation interviews, and document analysis of students’ records. The data were analyzed using Lincoln and Guba’s (1985) Constant Comparative Method.

A distinctive aspect of this study was that photography was used for data collection. Photographs provide a good source of data, can vividly capture the setting for others, and can be creatively used to study the perspectives of people (Taylor & Bogdan, 1984). Interviews that are conducted about photographs are referred to as “photo elicitation interviews,” and are a variation of open-ended interviews (Harper, 1994, p. 410). In this study, the participants produced photographs to visually represent their persistence experiences in four-year institutions and participated in photo elicitation interviews to describe their experiences.

## **Results**

The GED recipients of this study were asked to provide an adjective that defined them and began with the same letter as their first name. The participants are referred to by their selected adjectives throughout the study.

Many students mentioned math as the enemy of persistence. Some of the participants felt that they were not adequately prepared for college-level math courses. Other participants shared their frustrations with math courses. Math was mentioned many times as the reason for having thoughts of quitting college.

Determined felt that the special education classes during high school did not

help to enhance his mathematical ability. He made the following statement:

I guess because I didn't learn it [math] in high school and I didn't really have enough time to learn it like I should and have that foundation like everybody else. I was always lagging behind my classmates when it came to math. Getting bad grades made me dislike it. It is probably the only subject that I had deficiencies in.

Beautiful talked about her concerns with mathematics. She stated, "I have to take the math class over. I have to really, really, really apply myself and it's hard trying to concentrate with the math." When Caring was asked if she ever thought about quitting college, she said, "Yes. It is usually after a math class." She did not understand the relevance of math. Caring further elaborated on math as follows:

Why can't I go through college without math? Why do I have to have math? I like English and I'm going to make beautiful essays. I'm going to work on this [essays] for six hours, and I'm going to have a wonderful essay because this is creative and it's an extension of me, but what is math? Math is just some stupid numbers that don't make any sense. I don't know why I have to learn this. My age group never learned Algebra. That was just an elective.

Just despises math. She said, "I hate math. That was the only class that I took every day of the week, twenty-four hours a day and seven days a week. I just do not like math. I can't focus on numbers." Darling expressed her feelings about math through photography. She happily stated, "Thank goodness for a calculator because I don't think I'd get through math without it."

During the focus group, individual, and photo elicitation interviews, concerns about mathematics emerged as a reoccurring theme. Many of the participants were stressed because of math. Some of the GED recipients believed that their lack of preparation in math during secondary school or the GED program resulted in under preparation for developmental and college level math. Moreover, this deficiency has caused some of the participants to have a fear of mathematics and lack of confidence for mathematics. Moreover, some GED recipients considered quitting college.

### **Discussion**

Math anxiety emerged as a recurring theme impacting the persistence of GED recipients. Many of the research participants were plagued with math anxiety. Research conducted by Betz (1978) showed that less advanced mathematical training combined with an absence from formal learning produces levels of anxiety and lack of confidence. The results of this study were consistent with the research of Betz (1978). Some of the participants acknowledged that their ability to do math was hindered because they did not complete high school. Perhaps these students are suffering from a low self-concept of their abilities or fear of personal failure.

Cemen (1987) stated that math-anxious people are often quick to tell themselves that they are unable to do math and by avoidance end their discomfort. However,

students can only avoid math for a limited time. All students are required to take some level of math to earn a bachelor's degree. One of the participants of this study who recently earned a bachelor's degree avoided math as much as possible. After taking the same math course two (2) times, he settled for a lower passing grade (D). Some of the students sought help from tutors, but still had much difficulty understanding math. One of the participants stated that the tutoring program was too much like a classroom setting because the room was always full. Perhaps this college could offer one-on-one tutoring to better meet the needs of its nontraditional students.

Some students stated that the adult education centers only prepared them to take the GED test. Perhaps GED testing centers should take into consideration that some students do enroll in college after earning the GED. A need exists to examine the impact of the adult education curriculum on students' educational goals. It may be helpful to have specific programs for college-bound students.

### Conclusion and Implications

Some treatment programs to alleviate math anxiety have been implemented. Siegel, Galassi, and Ware (1985) recommended increasing mathematics performance through intervention programs that focus on increasing math skills. The authors believed that the end result would be reduced math anxiety. Additional treatment programs include self-help books that focus on reducing or coping with anxiety or stress. Green (1986) recommended that a fundamental treatment to alleviating math anxiety is to simply practice mathematical problems. This finding supports the time on task literature. Research conducted by Bagayoko and Kelley (1994) revealed that the more time that a student devotes to a particular task, the better the student becomes at that task.

This research study showed that math anxiety hinders the persistence of some GED recipients. It shed some light on the topic; however, there is more to learn. More research is needed that focuses on GED recipients and math anxiety and effective intervention strategies that show students how to cope with math anxiety and be successful at mathematics in higher education.

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### References

- American Council on Education (1956). *Conclusions and recommendations on a study of the general educational development testing program*. Washington, DC.
- American Council on Education (2000). *Who took the GED: GED 2000 statistical report*. Washington, DC.
- Bagayoko, D., & Kelley, E. (1994). The dynamics of student retention: A review and a prescription. *Education, 115(1)*, 31-39.
- Betz, N (1978). Prevalence, distribution, and correlates of math anxiety in college students. *Journal of Educational Psychology, 25(5)*, 441-448.
- Blumer, H. (1969). *Symbolic interactionism*. Englewood Cliffs, NJ: Prentice-Hall.

- Bohuslov, R. (1980). *A method for dealing with attitudes and anxieties in Mathematics*. Alnarp, Sweden: Nova University. (ERIC Document Reproduction Service No. ED194158)
- Cemen, P. (1987). *The nature of mathematics anxiety*. (ERIC Document Reproduction Service No. ED287729)
- Fisher, M. (1999). A comparison of the academic performance of students with general educational development credentials and high school diplomas at a selected community college (Doctoral dissertation, Florida International University, 1999). *Dissertation Abstracts International*, 60, 629.
- Green, J. (1986). Interventional strategies for the treatment of math anxiety (math-phobia) (Doctoral dissertation, University of Akron, 1986). *Dissertation Abstracts International*, 47-04A, 1245.
- Harper, D. (1994). On the authority of image: Visual Methods at the crossroads. In N. Denzin & Y. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 118-137). Thousand Oaks, CA: Sage.
- Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Osei, M. (2001). GED diploma graduates: Performance, persistence, and attrition in four-year postsecondary education institutions (Doctoral dissertation, The College of William and Mary, 2001). *Dissertation Abstracts International*, 62/10, 3268.
- Owens, D. (1989). *First semester college performance of GED graduates at the University of Alaska Anchorage*. (ERIC Document Reproduction Service No. ED345014)
- Quilter, D. & Harper, E. (1988). Why we didn't like mathematics, and why we can't do it. *Educational Research*, 30, 121-133.
- Richardson, F. & Suinn, R. (1972). The mathematics anxiety rating scale: Psychometric data. *Journal of Counseling Psychology*, 19, 551-554.
- Siegel, R., Galassi, J., & Ware, W. (1985). A comparison of two models for predicting mathematics performance: Social learning versus math aptitude-anxiety. *Journal of Counseling Psychology*, 32, 531-538.
- Taylor, S., & Bogdan, R. (1984). *Introduction to qualitative research methods: The search for meanings* (2nd ed.). New York: Wiley.
- Tobias, S. & Weissbrod, C. (1980). Anxiety and mathematics: An update. *Harvard Educational Review*, 50, 63-70.
- Viens, J. & Kallenbach, S. (2001). Multiple intelligences in practice: Teacher research reports from the adult multiple intelligences study. Washington, DC: National Center for the Study of Adult Learning and Literacy. (ERIC Document Reproduction Service No. ED453386)
- Woodard, T. (2002). The effects of math anxiety on post-secondary developmental students as related to achievement, gender, and age (Doctoral dissertation, Argosy University/Seattle, 2002). *Dissertation Abstracts International*, 63/06, 2169.