CHAPTER V

Summary, Conclusions, And Recommendations

This chapter contains a summary of the study including the purpose, the statement of the problem, research procedures, summary of the findings, and the recommendations.

Summary

Community colleges offer a variety of remedial courses in mathematics designed to enhance the mathematics skill levels of students based on the placement test score. The range of students who take remedial mathematics is from less than 30 percent to over 75 percent according to the Southern Regional Education Board (2000).

Each fall, over 50 percent of entering students place into a developmental mathematics course at Prince George's Community College (Office of Institutional Research and Analysis Report, 1998). In the fall semester of 1997, 1338 students placed into developmental mathematics (57 percent). The number of students who placed into DVM001 Basic Arithmetic was 329 students (25 percent).

The purposes of this study were to describe the student population and to assess the difference, if any, of the initial and exiting attitudes toward mathematics and academic outcomes of students enrolled in the Developmental Mathematics Basic Arithmetic course at Prince George's Community College. The study also examined if the placement test predicts the final exam, attitude pretest, and attitude change scores. Along with the test scores the study examined if there was a difference between the attitudes toward mathematics and course outcomes of students. This study collected the attitude data in two stages. In stage one, the Aiken Mathematics attitude Survey was administered at the beginning of the semester to assess the initial attitudes toward mathematics of the students enrolled in DVM001 Basic Arithmetic classes. In stage two, the Aiken Mathematics Attitude Survey was administered at the end of the semester to assess the exiting attitudes toward mathematics. Final exam scores and final grades were received from the course faculty member.

The problem in this study was to assess the effect, if any, of the initial and exiting attitudes toward mathematics have on the academic outcomes for students placed in Developmental Mathematics Basic Arithmetic classes at Prince George's Community College and to describe the demographics of the students. The population consisted of day and evening students who enrolled and completed the Developmental Mathematics DVM001 Basic Arithmetic course, participated in the Aiken Attitude Toward Mathematics pretest and posttest, and the final examination. The Aiken Attitude Towards Mathematics Survey was used to collect the initial and exiting data. The Aiken survey was composed of 20 statements (10 positive and 10 negative) that use a Likert scale to measure attitudes towards mathematics. The Office of Admissions and Records granted permission (Appendix B) to access the student records for the demographic data. Analysis of variance was used to analyze the data of the initial and exiting attitudes and the posttest attitude score and the final exam score based on the demographics of the students.

Increasing numbers of students are arriving at the community college in need of developmental mathematics. Over 57 percent of students entering Prince George's Community College need a course in developmental mathematics (Office of Institutional Research and Analysis Report, 1998). There is a need to utilize accurate tools for the development of placement assessment tools to identify students in need of developmental mathematics and to accurately place them into the correct level course of mathematics. Research studies are needed to develop intervention and retention strategies to put into operation to control the number of students who do not achieve success in developmental mathematics the first time taking the DVM 001 Basic Arithmetic course.

The attitude pretest revealed 61 percent of the students scored below 40 on the pretest showing low attitudes towards mathematics at the beginning of the semester. The students who scored higher than 40 percent on the Aiken Attitude Towards Mathematics was 39 percent. These students had an initial positive attitude at the beginning of the semester in the DVM001 Basic Arithmetic course. Looking at the differences between the attitude towards mathematics pretest and posttest revealed that there is a strong linear

relation between the pretest and posttest attitude score values. The results showed that the posttest was 1.7 points greater than the pretest score but the pretest and the posttest were not significant.

Correlation of the placement test revealed that the placement score and the final examination score are highly significant. We can conclude that a high placement score would earn a high final exam score in the DVM001 Basic Arithmetic course. The correlation between the placement score and the attitude pretest and attitude difference was not significant.

Achievers and nonachievers have the same attitude towards mathematics revealed the t test. The results showed no significant difference in attitude between students who passed and students who failed.

Based on the demographics of the achievers and nonachievers, 75 percent (129 females) of the achievers were females and 25 percent (44 males) of the achievers were males with a total of 173 students. The older and smarter the student, the better they perform, especially, the female students, in the DVM001 Basic Arithmetic course.

Conclusions

The following conclusions are based on the findings of this study: Identification and placement of underprepared students are essential to students attending the community college in the developmental mathematics area. Registration demographic data are a crucial part of this early identification process and placement in the appropriate math level classes.

Attitude pretest and post test scores showed a moderate association where p= .41. When students have positive attitudes about mathematics they are more effective learners than students with poor attitudes towards mathematics (Ma & Kishor, 1997). This was evident when the 30 year old and above females performed better than the 30 year and above male students on the final examination in the DVM001 Basic Arithmetic course. The Aiken attitude survey revealed the higher the pretest scores the higher the final exam score. Older female student groups showed a higher pretest attitude score. Those students that passed (achievers) tend to be older than those students who failed (nonachievers).

Attitude scores for women are positively related to the placement score and the final examination score. This study concurs with Stage and Kloosterman (1995) that male and female attitudes did not differ significantly about mathematics but the attitudes were more strongly related to the final grade. For males, there was little attitude change but this little change was contributed to the pretest attitude scores to begin with. There are some variables about men other than attitude towards mathematic that contribute to their final grade. This study confirms the conclusions of Bassarear (1991) that attitudes influence achievement in different ways for different types of students based on gender.

Placement is the foundation of developmental mathematics courses and cut scores vary from college to college indicated Akst and Hirsch (1991), Abraham (1992). The National Center for Developmental Education (1997) and the New Jersey Basic Skills Council (1988) support mandatory placement in mathematics courses, which the community college in this study has adopted and has shown, is effective. Placement scores are highly significant as predictors of the final exam score. The placement test score was more important for females and less important for males. Student outcomes of the study showed 52 percent of the students passed the course while in the Seybert (1992) study indicated that less than 40 percent of the students completed and passed the course.

Recommendations

The results of this research study suggest that the placement score assist the community college to enrolled students in the DVM001 Basic Arithmetic course. The study of Faro-Schroeder (1995) recommended placement testing to ensure that students would be enrolled in the skill appropriate mathematics course.

There is a great need for research studies and retention programs to evaluate and take action to assist the large numbers of students failing, withdrawing or quitting the basic mathematics course. Over 50 percent of the students entering the community college need a developmental mathematics course to prepare them for college level credit courses (Office of Institutional Research and Analysis Report, 1998). This foundation course is the entrance level mathematics course designed to start students deficient in mathematics to progress to credit courses. Mathematics courses are required in a variety

of curricula. Students must be identified when they first enter the education environment of the community college. Placement examinations must accurately identify the level of mathematics to start students who are at risk of achieving passing levels of performance in mathematics. The demographic variables, age and gender, of the students are essential to the identification of students and early alert in their programs of study to determine the need for intervention and assistance.

Additional recommendations include:

1. To develop and to revise periodically the contents of a course for students who have not mastered the basic skills at lower than DVM001 Basic Arithmetic that would concentrate on the fundamentals of mathematics. Since 48 percent of the students did not pass the course, a fundamental mathematics course would prepare students in basic mathematics in the areas of adding, subtracting, multiplication, division, fractions, percent, and whole numbers.
2. To share with the middle and high school mathematics department the depth of the concern that students in larger percents are entering the community college underprepared for the DVM001 Basic Arithmetic course.
3. To counsel students one on one, provide mentors, and understand that males were more prone to dropping out, failing, or withdrawing from the course than females.
4. To enhance the current retention program to identify, and continue to offer workshops on developing positive attitudes towards mathematics.
5. To perform this study at other community colleges that need assistance to identify and place students in DVM001 Basic Arithmetic.
6. To place in cohorts to support and motivate each other while enrolled at the community college.

Understanding the attitudes toward mathematics will assist faculty at various grade levels to carefully assess basic mathematics skills. Faculty can comprehend and relay to students the importance of mathematics throughout the K-12 and the college curriculum. Underprepared students can be identified in early grade levels and given appropriate individual assistance. At an early stage in the lives of children, attitudes can be learned to respond positively to mathematics.