

Qualitative Research: The Viability to Create a Mathematics Private School in Honolulu for
Secondary and Undergraduate students to Study Math in Advance.

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Abstract

The purpose of this paper was to elaborate qualitative research to check the viability to create a private math school called *MathVantage* in Honolulu. The instrument to collect data was a questionnaire. The study used a convenient sample (N=18) from colleagues from Chaminade and adult friends from Honolulu. The results showed that 61.1% like or love math, 88.8% believe that math is important or very important to achieve your professional goals, 94.5% agree or strongly agree that studying mathematics in advance make the Hawaiian life easier in the future, 77.8% agree to study at least one hour per week math in advance, 77.8% agree or strongly agree that high school students need to study calculus in advance (limits, derivatives, and integrals), and 92.8% advise a friend to study mathematics in advance. The major reasons to study math were because it is a basic part of any professional "mind based" job, and the basis for all sciences. The major reasons to study math in advance were because it is fun, gets you ahead, makes your life easier, and prepares students for college.

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Chapter 1 - Introduction

Background

Bonham (2011) reported that there is considerable public debate about the unpreparedness of students entering college, and a large number of students place into remedial or developmental courses, particularly mathematics. Hill (2010) reported that concerns about the gap between the high school and the college have led to cries for change in high school mathematics.

Policymakers have urged raising graduation requirements in an effort to increase the number of students who take advanced math classes. However, high school students especially among Black, Latino, and Native American youth and students of low socioeconomic status *exacerbates this challenge*. Hill (2010) asked how can schools avoid math dropouts and encourage students to persevere through a challenging math curriculum?

Importance of Study

This qualitative research will be used to investigate the possibility to create an innovative private math school in Hawaii called “*MathVantage*” for simplicity, where the secondary and undergraduate students can be enrolled in math courses like Algebra, Trigonometry, Pre-Calculus, Calculus Differential and Integral in advance. This means that students with 12 years old or more can take a math class in *Advance* to improve their background before they take it to their respective school. The advantage of this innovation is that the students can be prepared and focused in math without any pressure from grades of a traditional math class. A questionnaire (See appendix) is the instrument to collect data using a convenient sample from colleagues from

Chaminade and adult friends from Honolulu. Through this qualitative research will be used to investigate the necessity to create the “MathVantage” school in Hawaii.

Statement of the Problem

This qualitative research will be used to investigate the viability to create an innovative private math school in Hawaii called “*MathVantage*”. To check the viability to create *MathVantage*, the problems are divided in six initial research questions.

Research Questions

All of the following initial research questions for this study are (Please consider the term Hawaiians to address to the people who can study in Hawaii):

Research Question 1. Do Hawaiians like to study mathematics?

Research Question 2. Do Hawaiians think mathematics is important to achieve your professional goals?

Research Question 3. Does studying mathematics in advance make the Hawaiian life easier in the future?

Research Question 4. How many hours per week would Hawaiians study math in advance?

Research Question 5. Do Hawaiians high school students need to study calculus in advance (Limits, derivatives, and Integrals)?

Research Question 6. Do Hawaiians advise a friend to study mathematics in advance? Why?

Chapter 2 - Review of Related Literature

Bonham (2011) reported that there is considerable public debate about the underpreparedness of students entering colleges. To solve this problem, a large number of students who place into remedial or developmental courses. Attewell, Lavin, Domina, and Levey (2006) reported that remedial education is widespread, and their analyses indicate that about 40% of traditional undergraduates take at least one such course, and remediation is even more common among older nontraditional students. However, according to Bonham (2011), remedial math courses students are prevented from achieving their educational goals because they never complete these courses. Hill (2010) explained that concerns about the gap between the high school and the college have led to cries for change in high school mathematics. Policymakers have urged raising graduation requirements in an effort to increase the number of students who take advanced math classes. On the other hand, high school students especially among Black, Latino, and Native American youth and students of low socioeconomic status exacerbates this challenge. How can avoid math dropouts and encourage students to persevere through a challenging math curriculum? In Bellomo & Strapp (2008) reveal inadequate high school preparation in terms of disciplinary content or depth, conceptual grasp, or study skills, and show how course scope, goals, structure, and analysis of the curriculum to prepare high school students to face undergraduate degrees in mathematics. The theme of this qualitative research is to show a solution to increase the quantity and quality of students pursuing studies in mathematics at the university level. The main idea of the Bellomo & Strapp (2008) is to introduce high school students a list of college classes like Calculus, Statistical Methods,

Differential Equations, Linear Algebra, Probability Theory, Discrete Mathematics, Elementary Theory of Numbers, History of Mathematics, Abstract Algebra, and College Geometry. Although this program has not currently been field tested, the proposed Survey of Advanced Mathematics Topics class could increase the quantity and quality of students pursuing studies in mathematics at the university level. Since to change a secondary math curriculum is going to cause bureaucratic fighting among education leaders and teachers (Darling-Hammond, 2010), a school like *MathVantage* can be a fast and easy solution to minimize this problem.

Chapter three describes the research methodology of this study, as well as a discussion of the method of inquiry, population and sample, and instruments and experimental procedures used to gather the data.

Chapter 3 - Methodology

Purpose

The purpose of this study is to investigate the viability to create an innovative private math school in Hawaii called “*MathVantage*”. This chapter is divided into five different sections: Method of Inquiry, Population and Sampling Techniques, Measurement and Instrumentation, Research Hypotheses, and Strengths and Weaknesses.

Method of Inquiry

The method of inquiry is based on a non-experimental design, which collected all the data through a survey. The survey is a questionnaire (see appendix) with six questions (five multiple choice and one open-end question).

Population and Sampling

The population of this study is the state of Hawaii, and a convenient sampling was selected for this study. The sample of this study was colleagues from Chaminade University and adult friends from Honolulu. Until now, 19 adults (30% of the sample) filled the questionnaire.

Measurement and Instrumentation

The instrumentation that was used in this study to evaluate the viability to create *MathVantage* was a questionnaire (See the appendix). The questionnaire was generated, the data was collected, and the descriptive and statistical analysis of the responses was accomplished by *Google Docs*. This software can create a simple or in-depth online surveys, share them from a link, embed them on your website, or even right inside an email, and organized in a Google spreadsheet for a descriptive and statistical analysis of the responses.

Research Hypotheses

This section explains how the data collected in the survey was related with each research question. Each research question is directed related with a correspondent question in the questionnaire.

Research Question 1. Do Hawaiians like to study mathematics?

Question 1. Do you like to study mathematics?

Research Question 2. Do Hawaiians think mathematics is important to achieve your professional goals?

Question 2. Do you think mathematics is important to achieve your professional goals?

Research Question 3. Does studying mathematics in advance make the Hawaiian life easier in the future?

Question 3. Does studying mathematics in advance make your life easier in the future?

Research Question 4. How many hours per week would Hawaiians study math in advance?

Question 4. How many hours per week would you study math in advance?

Research Question 5. Do Hawaiians high school students need to study calculus in advance (Limits, derivatives, and Integrals)?

Question 5. Does a high school student need to study calculus in advance (Limits, derivatives, and Integrals)?

Research Question 6. Do Hawaiians advise a friend to study mathematics in advance? Why?

Question 6. Do you advise a friend to study mathematics in advance? Justify.

Strength and Weakness

Strength: The sample of this study was high educated adults.

Weakness: The sample is too small, and it doesn't represent the Hawaiian population. Also, it wasn't used an Informed Consent due the short time to prepare this paper.

Limitations

The first limitation was the time to accomplish this research. The maximum time to complete this research was approximately one months. The second limitation was the budget because the researcher had no sponsor to support research costs.

Delimitations

Due to the budget and time limitations of the research, the convenient sample was restricted to the available email addresses. A total of eighteen colleges from Chaminade and friend answered the survey.

Chapter 4 – Results

Purpose

The purpose of Chapter Four is to present a detailed analysis of the data collected in the survey. The first five questions (1-5) from the questionnaire are multiple-choice, and a descriptive statistics about the answers were analyzed from the Doc Google worksheet. The last question (6) from the questionnaire is an open-end, and a descriptive statistics of the possible patterns. In the next subsection, the descriptive statistics present the results of the parents' answers of the thirty-six questions about the children's computing environment and mathematics achievements.

Descriptive Statistics

The frequencies, percentages, means, and standard deviations of each of the possible answers of the six questions (1-6) are indicated in Tables 1 to 6. The frequencies, percentages of each patterns are indicated in Table 7.

Table 1

Frequencies and percentages of the question 1

1. Do you like to study mathematics?	Frequencies	(%)
1. Hate	1	5.6
2. Don't like	0	0
3. Neutral	6	33.3
4. Like	6	33.3
5. Love	5	27.8
No answer	0	0

Notes: N = 18, Mean = 3.8, and Std Deviation = 1.1

Frequencies and percentages of the question 2:

2. Mathematics is important to achieve your professional goals.	Frequencies	(%)
1. Not important	0	0
2. Little important	0	0
3. Neutral	2	11.1
4. Important	8	44.4
5. Very important	8	44.4
No answer	0	0

Notes: N = 18, Mean = 4.3, and Std Deviation = 0.7

Table 3

Frequencies and percentages of the question 3:

3. Mathematics is important to achieve your professional goals.	Frequencies	
	s	(%)
1. Strongly disagree	0	0
2. Disagree	0	0
3. Neutral	1	5.6
4. Agree	12	66.7
5. Strongly agree	5	27.8
No answer	0	0

Notes: N = 18, Mean = 4.2, and Std Deviation = 0.5

Frequencies and percentages of the question 4:

4. How many hours per week would you study math in advance?	Frequencies	
	s	(%)
0. Never	4	22.2
1. 1 hour	6	33.3
2. 2 hours	5	27.8
3. 3 hours	2	11.1
4. 4 or more hours	1	5.6
No answer	0	0

Notes: N = 18, Mean = 1.4, and Std Deviation = 1.1

Table 5

Frequencies and percentages of the question 5:

5. A high school student should study calculus in advance	Frequencies	
	s	(%)
1. Strongly disagree	0	0
2. Disagree	1	5.6
3. Neutral	3	16.7
4. Agree	12	66.7
5. Strongly agree	2	11.1
No answer	0	0

Notes: N = 18, Mean = 3.8, and Std Deviation = 0.7

Table 6

Frequencies and percentages of the question 6 (Yes or No):

6. Do you advise one friend to study mathematics in advance?	Frequencies	
	s	(%)
0. No	1	5.6
1. Yes	13	72.2
No answer	4	22.2

Notes: N = 18, Mean = 0.93, and Std Deviation = 0.3

Table 7

Frequencies and percentages of patterns of the question 6 (Justification):

6. Do you advise one friend to study mathematics in advance?	Frequenci es	(%)
Math is used everyday.	1	5.6
Math is the basis for all sciences.	2	11.1
Math is extremely important to the world in every way.	1	5.6
Math is a basic part of any professional "mind based" job.	3	16.7
Study math in advance will just make your life easier in the future.	3	16.7
Study math in advance is fun.	2	11.1
Study math in advance could get you ahead.	2	11.1
Study math in advance you can help others.	1	5.6
Study math in advance help to be admitted in college.	1	5.6
Study math in advance definitely help.	1	5.6
Study math in advance can help in high school.	1	5.6
Studying mathematics in advance would better prepare students for college.	2	11.1
No answer	4	22.2

All of the initial research questions for this study are answered (Please consider the term Hawaiians to address to the people who can study in Hawaii).

Research Question 1. Do Hawaiians like to study mathematics?

The mean was 3.8 and the Std Deviation was 1.1, and 61.1% like or love math.

Research Question 2. Do Hawaiians think mathematics is important to achieve your professional goals?

The mean was 4.3 and the Std Deviation was 0.7, and 88.8% believe that math is important or very important to achieve your professional goals.

Research Question 3. Does studying mathematics in advance make the Hawaiian life easier in the future?

The mean was 4.2 and the Std Deviation was 0.5, and 94.5% agree or strongly agree that studying mathematics in advance make the Hawaiian life easier in the future.

Research Question 4. How many hours per week would Hawaiians study math in advance?

The mean was 4.2 and the Std Deviation was 0.5, and 77.8% agree to study at least one hour per week math in advance.

Research Question 5. Do Hawaiians high school students need to study calculus in advance (Limits, derivatives, and Integrals)?

The mean was 3.8 and the Std Deviation was 0.7, and 77.8% agree or strongly agree that high school students need to study calculus in advance (Limits, derivatives, and Integrals)

Research Question 6. Do Hawaiians advise a friend to study mathematics in advance? Why?

Let No = 0 and Yes = 1. The mean was 0.93 and the Std Deviation was 0.3, and 92.8% of the participants that responded the question (6) they advise a friend to study mathematics in advance.

Chapter 5 – Discussions

The results showed that 61.1% like or love math, 88.8% believe that math is important or very important to achieve your professional goals, 94.5% agree or strongly agree that studying mathematics in advance make the Hawaiian life easier in the future, 77.8% agree to study at least one hour per week math in advance, 77.8% agree or strongly agree that high school students need to study calculus in advance (limits, derivatives, and integrals), and 92.8% advise a friend to study mathematics in advance. The major reasons to study math were because it is a basic part of any professional "mind based" job, and the basis for all sciences. The major reasons to study math in advance were because it is fun, gets you ahead, makes your life easier, and prepares students for college. Note that the sample is too small, and it doesn't represent the Hawaiian community, then the results are inconclusive, i.e., we can't confirm the viability to create a private mathematics school called *MathVantage* in Honolulu, but there is an positive and enthusiastic environment to created it.

References

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Appendix

Questionnaire

Please fill this MATH SURVEY for Patrick Chevalier

The purpose of this questionnaire is to examine the viability to create a private math school in Hawaii that prepare secondary students to face mathematics in the university. You can contribute to the qualitative research of this important topic by answering the six questions (Less than 5 minutes). There is no "right" or "wrong" answer, the responses are confidential, and will not be used for any other purpose. Please click only one answer for each question, and the last one is a essay question. Thank you for participating in my survey.

1. Do you like to study mathematics?

1. Hate 2. Don't like 3. Neutral 4. Like 5. Love

1 2 3 4 5

Hate Love**2. Mathematics is important to achieve your professional goals.**

1. Not important 2. Little important 3. Neutral 4. Important 5. Very important

1 2 3 4 5

Not important Very important**3. Studying mathematics in advance makes your life easier in the future.**

1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

1 2 3 4 5

Strongly disagree Strongly agree**4. How many hours per week would you study math in advance?**

0. Never 1. 1 hour 2. 2 hours 3. 3 hours 4. 4 or more hours

0 1 2 3 4

Never 4 or more hours**5. A high school student should study calculus in advance (Limits, derivatives, and Integrals)**

1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

1 2 3 4 5

Strongly disagree Strongly agree**6. Do you advise one friend to study mathematics in advance? Justify.**

(Yes or No) Justify.

