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Central America
AN INVESTIGATION OF THE FACTORS
THAT INFLUENCE THE SELECTION OF SCIENCE AS
AN ACADEMIC PROGRAM AT MAUD WILLIAMS HIGH
SCHOOL

by

Tamica Shayanne Codd

A supervised research project submitted in fulfilment of the
partial requirements for the completion of
Maters in Education

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School of Education
Faculty of Arts Law and Education
The University of the South Pacific

January, 2016
DECLARATION OF ORIGINALITY

Statement by Author

I, Tamica Codd, hereby declare that this thesis is my own work and that, to the best of, it contains no materials previously published, or substantially overlapping with material submitted for the award of any other degree at any institution, except where due acknowledgement is made in the text.

Signature: ........................................... Date: January 25, 2016

Name: Tamica Codd

Student ID No: S11095726

Statement by Supervisor

The research in this thesis was performed under my supervision and to my knowledge is the sole work of Tamica Codd.

Signature: ........................................... Date: ...........................................

Name: Dr. Mesake Rawaikea Dakuidreketi

Designation: Supervisor, Lecturer
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Abstract

In many countries, there has been a noticeable decrease in the number of students choosing some of the courses affiliated with the sciences. The subject of science education in the nation of Belize is an area that is very much lacking in research material that addresses this issue. This study was undertaken in an effort to fill the gap currently existing in literature and explore reasons behind the low number of students that are enrolled in the academic science program at Maud Williams High School. The following research questions were posed: 1) What are the prominent factors that influence students at Maud Williams High School when selecting their academic program? 2) What factors or processes promote or inhibit the selection of science? 3) How are factors that promote or inhibit the selection of science related? 4) How can these factors be addressed to promote academic science as a viable subject choice at Maud Williams? A mixed methods approach was used in which the results of two surveys were combined. The qualitative instrument used was an open-ended survey, while the quantitative instrument mainly included Likert scale type questions. Statistical analyses were conducted using chi-square tests. The major findings of this research were: 1) Selection of academic program was highly associated with motivation 2) Peer influence had an impact on selection of science as a first choice 3) Students had similar science experiences in both primary and secondary school 4) No significant association existed between teacher influence and science selection 5) The majority of science students reported having influence in the form of parents or family support combined with self-efficacy and motivation based on career goal or aspiration. Recommendations were then made for further study as well as to the school based on these findings.
**Abbreviations**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>CSEC</td>
<td>Caribbean Secondary Education Certificate</td>
</tr>
<tr>
<td>MWHS</td>
<td>Maud Williams High School</td>
</tr>
<tr>
<td>PSE</td>
<td>Primary School Examination</td>
</tr>
<tr>
<td>SES</td>
<td>Socio-economic Status</td>
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<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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Chapter 1: Introduction

Background

Science Education is a field of study that continually undergoes investigation. The literature as it relates to this particular topic is quite vast. Yet it remains one of the least researched areas in the country of Belize, especially as it pertains to the primary and secondary school system. The subject of science has for many reasons been perceived as challenging by many students, especially at the secondary school level (Debacker & Nelson, 2000; Osborne, Simon, & Collins, 2003). Due to this, students appear to choose any alternative offered to avoid studying science. Based on personal observation, both as a science student and a science teacher, the phenomenon of small science classes is very common place in Belize. The explanations for this tend to be based merely on speculation and there is need therefore to formally investigate the reasons behind the occurrence of such an issue, within the Belizean context.

At the culmination of form two at approximately fifteen years of age, secondary school students in Belize need to make a decision that could possibly determine the course of the rest of their lives. Students must select a course of study from various academic programs offered at the school. These programs vary among schools but tend to take a general format either Academic science (physics, chemistry, and biology, human and social biology and/or integrated science); Academic Business (Principles of Accounting, Principles of Business and Office Procedure) and Arts (Social studies, History, Geography and Visual Arts and Technical Drawing). Some schools have vocational (wood work, metal work) and Home Economics program (food and nutrition, clothing and textile). The options are made available and based on students’ prior performance in related general subject areas. Academic programs are selected based on students’ interest as well as administrations’ approval.

Maud William’s High School follows a similar pattern of schooling, as mentioned above. Its academic programs include Academic Science (specifically Biology, Human and Social Biology and Chemistry), Academic Business (specifically Office Administration, Principles of Accounting and Principles of Business) and Vocational
Technical (specifically Food and Nutrition, Technical Drawing, A/C and Refrigeration, Automotive and Electrical, Cosmetology, Clothing and Textile, and Food Preparation). Students also have the option of General Studies, which is a combination of any of the subjects that are offered.

**Research Problem**

In many countries, there has been a noticeable decrease in the numbers of students choosing (some of) the sciences (Sjøberg, 2002). The problem as it exists is that Belize is a developing country which seeks to reach developmental status by the year 2030. Part of the strategic plan to attain development status is to equip Belizeans with first rate scientific experience and technological advancements (Wagner, Brahmakulam, & Jackson, 2001). However with the small number of students that even considers enrolling in the academic science program, this vision is currently unattainable. It is therefore of utmost pertinence that an investigation be conducted into the factors that influence the students as they select their academic program.

Table 1 shows the number of students that were enrolled in the academic programs at the school in fourth form for 2013-2015 and both third and fourth form 2014-2015.

**Table 1: Number of Students Enrolled in Academic Programs for 2013-2015**

<table>
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<tr>
<td>Academic Science</td>
<td>7</td>
<td>17</td>
<td>24</td>
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<tr>
<td>Business</td>
<td>10</td>
<td>41</td>
<td>51</td>
</tr>
<tr>
<td>Vocational/Technical</td>
<td>13</td>
<td>47</td>
<td>60</td>
</tr>
<tr>
<td>General</td>
<td>4</td>
<td>14</td>
<td>18</td>
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Research Scope and Limitations

It is essential to establish though, that the scope of this research is restricted to one school in Belize City, where this problem is especially apparent. After discussing the matter with the members of the academic staff of Maud Williams High School, an interest was expressed in the exploration into the causes of this ongoing problem. In addition, a case study is the most logical approach due to the constraints of time and location of the author who was in Fiji and not Belize while the research was conducted. Therefore, it must be taken into consideration that it is within these constraints that this research was undertaken.

Research Aim

This research aims to investigate the factors that influence students’ selection of science as their academic program at Maud Williams High School.

Research Objectives

The specific objectives of this study were:

1. Survey the relevant literatures pertaining to the selection of academic programs in schools.

2. Investigate the relevance of and establish relationships between the factors that influence the selection of academic science as a course of study at Maud Williams High School

3. Make recommendations towards the improvement and accessibility of the academic science program at the school

Research Questions

This research aimed to answer the following questions:

1. What are the prominent factors that influence students at Maud Williams High School when selecting their academic program?

2. What factors or processes promote or inhibit the selection of science
3. How are factors that promote or inhibit the selection of science related?

4. How can these factors be addressed to promote academic science as a viable subject choice at Maud Williams?

**Justification on the use of Exploratory Research**

There have been many assumptions made about the reasons for the continued low numbers of students that typically select science as their academic program. Yet, no research has been done to necessarily prove that these reasons are the actual source of the problem. This reasoning justifies the use of exploratory research which would serve to describe the prevalence of the problem being investigated (*Encyclopedia of Research Design, Volume 1*, 2010). Having recognized the need for exploratory research in the field of science education (*Quality Research in Literacy and Science Education: International Perspectives and Gold Standards*, 2008), utilizing this approach to execute this undertaking is intended to serve two main purposes, firstly to examine the issue in order to gain some insight into the problem and secondly to take a more in-depth look at the factors that cause the problem at hand (McNabb, 2010). If these factors are identified, this study will mean a lot to the Belizean student especially for those in Southside Belize City, where MWHS is located.

**Theoretical Framework**

It is important to place one’s research in a particular context, basing assumptions on a particular theoretical foundation. One major theoretical assumption that this research is based on is that of Lev Vygotsky’s Socio-Cultural theory. Vygotsky’s theory explicitly states that learning is highly dependent on social relationships and social constructions (Culatta, 2013). This significant interaction that exists between learning and social interaction is very apparent in the field of education (Kozulin, 2003). So it is only fitting that this theoretical understanding be utilized. Another supporting theory for this research is that of Bronfenbrenner’s Ecological Systems Theory. This systematic approach also acknowledges the dynamic role that the environment plays in the cognitive development of children and adolescents (Bronfenbrenner, 1994). This research involved the exploration of some of those environments based on Vygotsky’s
socio cultural theory as well as Bronfenbrenner’s ecological approach as a baseline for further investigation and subsequent adjustment by school administrators, parents and hopefully the overall community.

**Belize and its Educational System**

Belize is a small country that was a former British Colony. It was once known as British Honduras and gained its independence in 1981. Belize is located on the isthmus of Central America and is geographically a part of this region. It is bordered in the north by Mexico and west and south by Guatemala and in the east by the Caribbean Sea. It also shares a very close historical background with the Caribbean and is also recognized as a part of this region. The official language is English, but since there is a variety of cultural groups a number of other languages are also spoken. The population of Belize is approximately 318,000 as estimated in the 2010 census. Belize is divided into six districts namely, Corozal, Orange walk, Cayo, Belize, Stann Creek, and Toledo. As mentioned before it is also a very diverse nation, having a number of ethnic groups. These groups include Mestizo, Creole, Garifuna, East Indian, Mennonite and the Maya who are the indigenous people, as well as a growing oriental community (Statistical Institute of Belize, 2010).

There are two major cities and seven towns. The capital city is Belmopan which is located in the Cayo District. Belize City which is the former capital of the country as well as the commercial center is located in the Belize district. With a population of 65,042, Belize City is the largest of Belize’s inhabited areas (Statistical Institute of Belize, 2010). Because of its location and job opportunities, people from practically all ethnic groups have migrated to the Belize City, settled there and have started families. This creates a unique situation for Belize City especially as it pertains to the educational system.
The political and economic history of Belize is a common one for the Caribbean region (Lundgren, 1992). The same can also be said of its educational system which is similar to that of other British colonies. Belize’s education system emerged out of a church state system that was established by missionaries under the supervision of the colonial masters (Ashcraft & Grant, 1968; Bennett, 2008; Lundgren, 1992). The initial purpose of education was to instill a sense of morality in those who were former slaves through the teaching of Christianity (Bennett, 2008). As a result, the church state system continues to dominate the Belizean educational system.

The secondary school system began in 1889 with the Methodist Church establishing the Wesley High School for boys (Bennett, 2008). This system has since evolved and includes private, government and church run schools (Ministry of Education, 2012).
There are 53 secondary schools within Belize and 14 are located within the commercial hub of Belize City (Ministry of Education, 2012).

The current Belizean school system which is still based on the British educational system is divided into three levels. These are primary, secondary, and tertiary. Belizean children begin their eight years of primary education with two years of “infant” classes (usually at the age of five), followed by six “standards”. Secondary education consists of four “forms”. The tertiary education then begins at “sixth-form” or junior college. At completion students are certified with an Associate’s Degree. Students may also choose to pursue University studies to earn a Bachelor’s or Master’s Degree (Beltraide, 2012). The diagram below shows the stages of education in Belize.

Figure 1: Flow Chart of Belize’s Educational System

![Flow Chart of Belize’s Educational System](source: Beltraide, 2012)

**Maud Williams High School**

Maud Williams High School was first established in the year 2000, originally under the name of St. Michael’s College. The name was eventually changed to pay homage to an icon of the Belizean education system. In a 2009 report by the Amandala newspaper, Maud Williams High School was noted to have a school population of twenty-six (26) faculty members and two hundred seventy-six (276) students (Humes, 2009). Recent reports have also indicated that the student population at the school has declined from a
population of three hundred thirty-six (336) in 2012 to two hundred fifty-six (256) in 2013, which is a drop of 23% although the number of teachers employed has remained constant (Ramos, 2014). Currently, the government is considering amalgamating two other schools with Maud Williams in order maximize on the services of the teachers and the programs available at Maud Williams.

Figure 2: Graph Showing Student Enrolment (2008-2014)

Source: Adapted from Ministry of Education, 2014

Organization of Thesis

This research paper consists of four subsequent chapters. Chapter two is a review of literature, as it relates to the topic. It surveys what previous authors have said in relation to the sciences in high school and primary school. Furthermore, students’ attitude toward science motivation, and other works that directly relate to the influencers of the selection of academic majors are discussed. The third chapter describes the methodology utilized to collect data for the research and justifies the methods. The fourth chapter provides an analysis of the findings of this study from both qualitative and quantitative perspectives. Finally the fifth chapter brings this research to a close by concluding with a discussion of the major findings. The implications, recommendations and a final summary of the research findings are also presented here.
Chapter 2: Literature Review

Introduction

Studying science has often been perceived as being arduous; and it has been observed that adolescents tend to evade the sciences when given an option to pursue a specific course of study upon entering third form. The selection of science as an academic major, has great implications as it often leads to the selection of careers within the field of science (Lavigne, Vallerand, & Miquelon, 2007); therefore, it is important that the factors that influence students’ affinity towards science and subsequently their selection of science as a major is very important. Multiple factors have been cited as having an influence on students’ selection of science as course of study. These factors can be placed into four major categories: (1) parents and family background (2) socio-economic status (3) race, culture and ethnicity, (4) teacher.

This literature review highlights some of the most recent and prominent factors from the available literature. Those that will be emphasized here include the parents and family background, the teacher, self-efficacy and motivation, and gender.

Parents and Family Background

Parents are certainly the most influential elements in an individual’s life. Therefore it is only natural that an individual’s parents should play a significant role in his/her decision to become an academic science student. Several studies suggest that parents and family background are the most influential factors in science selection, (Johnstone, Haines, & Wallace, 2001; Pinder, 2012; Rayfield, Murphrey, Skaggs, & Shafer, 2013). This section will look at parents and family background and home structure, as well as socio-economic status and race/culture/ethnicity as major influencers of science performance and selection.

Parents

Johnstone et al. (2001) conducted a comparative study of students who participated in science with those who did not participate in science. They sampled a total of one
hundred twenty-one (121) science majors and one hundred sixty (160) social science majors comprising 66% of women and 34% of men. The findings in this study indicated that having parents who assist with homework and assignments produce children who are more successful and more autonomous in the field of science (Johnstone et al., 2001; Lavigne et al., 2007; Tam & Chan, 2009).

Additionally Singh, Granville, & Dika (2002) found that cognitive abilities of students and their home background are important predictors of achievement in science. This study found that there are other variables within the parent factor that have emerged as having an influence on students’ affinity with science. One such variable would be academic time spent on homework. This means having parents who are actively involved and engaged in the completion of homework and assignments is a crucial component. This type of investment in time for homework is specifically regulated by parents from an early age and studies have shown that factors like socio-economic status in conjunction with parental involvement may have an even greater impact (either positive or negative) on student science ability and performance (Tam & Chan, 2009).

Another study agrees that the influence of parents are especially significant and play an important role in the course of study selected by students (J. Lee, 2002). In support of this, it is also noted that parental support is seen as one of the protective factors that guard against student failure in the sciences (Von Secker, 2004).

Pinder (2012) studied and compared high school students from the Caribbean with their African American counterparts. He surveyed 300 students and found that parental factors such as living with their father and mother, household numbers, and having parents who assist with homework all contributed to high science performance and possibly subsequent science selection. On the other hand, Osborne, Simon, & Collins (2003) noted in their review of literature regarding science attitudes that Afro-Caribbean students seem to shy away from science preferring to pursue degrees in the social sciences.

These variables may very well have some implications for this study considering the location of the school and the fact that many of these children probably come from
single family homes, and they may also lack basic resources due to their socio-economic status.

**Socio-economic status**

Generally, it is expected that students with high socio-economic status (SES) perform better than those with low SES (Smith et al., 2007). Socio-economic status has a significant role to play in terms of the availability of resources, books, computers etc. (Areepattamannil, Freeman, & Klinger, 2010). There is some logic in this since parents may need to invest in certain equipment or supplies for at home activities or experiments at school. The inaccessibility to other resources such as technology may also impact students’ ability to access information and online activities that would enhance their experience as science students. In light of these issues, SES is considered a factor that affects students’ affinity to science (Von Secker, 2004).

To elaborate on the connection between socio-economic status and parents, Tam & Chan (2009) found that socio-economic factors not only impact but also work in conjunction with parental involvement as it pertains to assisting with homework. The interconnection between these factors was demonstrated in a large-scale study. This study, which took place in Hong Kong, surveyed 1309 students and parents from 36 primary schools. They used a mixed methods approach, employing both questionnaires and diaries to collect data. The ecological approach was utilized for their analysis which explained that middle class parents are usually more inclined to help students with their homework but there is a greater impact on student achievement when the working class parents or those with low of a lower SES help their children.

When considering the SES as a factor, there may be some major implications for this school, since Maud Williams High School is located within the heart of Southside Belize City. The poverty rate in this area has been reported as the lowest within the country of Belize. One report on poverty in Belize by, (Lomberge, Kamper, & Wendt (2012) stated that UNICEF reported 54% of residents in Southside Belize are considered poor, with another 26% considered indigent which exceeds the national poverty rate of 14% (Halcrow Group Limited, 2010). This means that there are students who do not have access to what some may consider as basic resources, for example a computer or
even books. In many cases parents may be struggling to put food on the table, so having a computer is seen as a luxury and not a necessity. This situation would generally put students at a disadvantage within any classroom and would also lend itself to students being at a disadvantage to selecting science.

Similar results were found in two studies done in Fiji by Dakuidreketi (1995, 2004) which indicated that socio-economic factors does lead to diminished performance in science. In this case a comparative study between Indo-Fijian and iTaukei communities within Fiji was conducted. This entire study speaks of another aspect of family background, this is race, culture and ethnicity. This current investigation is interested in finding out whether or not SES contributes to the problem in the context of Maud Williams School.

Race, culture and ethnicity

Although the social structure at the school in terms of culture and ethnicity are quite different from the Fijian context, this factor may still have an impact on students as they decide to choose science as their academic program of preference. There are a number of indications that lean toward the view that race, culture, or ethnicity would have an effect on students’ selection of science (Pinder, 2012; Von Secker, 2004).

Uekawa et al. (2007) studied a small sample of ten students using experience sampling method (surveys), classroom observation, and focus group interviews. This study assumed that sociolinguistic differences caused by varying ethnic groups in one setting may deter students from learning science and selecting science. Contrary to their initial assumption though, this same study revealed that some students of Hispanic decent do outperform their non-Hispanic peers, especially when instructions are clear, challenging, relevant and academically demanding (Uekawa et al., 2007).

Socio-linguistic factors may also play a role in students learning science. Considering the plurality of the Belizean society having students from various ethnic and cultural backgrounds is very likely in any given classroom setting. Language particularly is expected to play a significant role. While English is the official language of Belize, it is not the first language for many students. Within the Belizean classroom, students often
struggle to speak English as many students grow up speaking Kriol (language spoken by majority of Belizeans developed by slaves to communicate among themselves, similar to pidgin (Michaelis, Maurer, Haspelmath, & Huber, 2013) and in some homes Spanish as their first language. Rubinstein (1979) mentioned that Young (1973) noted that Creole (Kriol) students within Belize City have struggled in the classroom because of their non-English backgrounds. In addition to language barriers, the language and terminology used in science tends to be complex and concepts may be difficult to assimilate if they are not delivered in simplified and yet exciting and interesting manner.

Agreeably, parents and family background, inclusive of ethnicity and SES, are expected to be extremely influential in adolescent decision making in terms of what course of study they choose to pursue, but parents are not the sole influence on any child’s life. There are several socializers that are involved in influencing decision making (Dick & Rallis, 1991) in regard to science choices; which means, there are other factors that need to be considered, mainly because students spend a large portion of their hours out of the home and in the classroom. This would mean then that the involvement of the teacher must also be taken into account.

**Teacher**

The most direct way to influence students is through a medium with which they have the most contact. Considering the vast number of hours spent in a classroom the medium that students would interact with most would be their teacher. Studies show that classroom and instructional activities play a key role in student engagement in science (Uekawa et al., 2007). Evidence also indicates that hands-on, constructivist approaches have a positive effect on science learners and is essential for science achievement (Areepattamannil et al., 2010). Herbert and Lohrmann (2011) also agree with this notion, stating that student interaction is an important part of lesson delivery. Inquiry-based teaching plays a central role in student science achievement, therefore boosting performance and self-confidence and ultimately science selection (Smith et al., 2007). Johnstone et al. (2001) also state that this better experience allows for better preparation and performance in science. Success in improving primary science can be expected to increase the subsequent take up of science options at secondary level and beyond.
This has major implications for science teachers at the primary school level considering that is where students will have their initial exposure to science.

This view focuses on pedagogy, but another perspective exists which emphasizes the attitude of the teacher towards science may also impact the attitude of the student. Students who are exposed to science classes that are engaging and stimulating tend to gravitate toward science (King & May, 2014; Osborne et al., 2003).

Conversely, the role that the teacher plays can be perceived as being very complex. Barton (1997) explains that teachers need to have a thorough understanding of science including its content, culture and discursive practices. In addition, teachers must have an understanding of their students and the educational processes that are involved in the teaching of science. This composite role of the teacher may very well mean that teachers have an immense role in influence of the selection of and academic major.

Dick & Rallis (1991) conducted a large scale study of two thousand two hundred thirteen (2,213) high school seniors using random sampling in Rhode Island, USA. This study constituted of students from various socio economic levels, racial backgrounds, and types of school. They surveyed various factors in student career choice selection based on both science and non-science oriented career choices. Teacher influence was determined to be a prominent factor in two specific instances. The first being that the teachers were reported to have more influence in non-science males than females and the second was that students that are well prepared in the sciences generally attribute their choice in science related careers to the influence of their teacher. The pervasiveness of teacher influence in the career choices in both groups could very well mean that the same type of influence is applicable in the choosing of an academic program, which could eventually lead to a career choice.

While some studies argue that the teacher plays a minor role in science selection, others indicate that teachers are the single most important factor, even more so than the parent in influencing students (Desy, Peterson, & Brockman, 2011; Von Secker, 2004). While one cannot dispute the fact that teachers play an important role as motivator (Lee & Wah, n.d.), one must not ignore the fact that if a child does not have the interest or the
confidece to pursue science then that child will not have any motivation to do so. This means that students need to have some confidence or positive self-belief in their ability to do well in science in order for them to pursue science.

**Self-efficacy and Motivation**

Confidence may be instilled by the teacher through consistent encouragement and hands-on activities, but ultimately, motivation to pursue science as a major must be intrinsic. This intrinsic motivation comes from self-efficacy. Self-efficacy by definition refers to the driving force behind human motivation, learning, self-regulation, and accomplishment (Bandura, 2006) and both teacher motivation and parent involvement are inherently linked to self-efficacy (Bandura, 2006; Pinder, 2012).

Considering the two aforementioned factors (parents and teachers), a notable relationship between teacher, parents and self-efficacy has also been established. Adults have a significant role to play in the development of children and their cognitive abilities. This concept has been established by both Vygotsky and Bronfenbrenner in their respective theories (Bronfenbrenner, 1979; Kozulin, 2003). This indicates that there are significant ramifications for parents and teachers as they work together at the primary school (Tam & Chan, 2009) as well as the secondary school level.

There is also a connection of science selection and an individual’s performance and self-efficacy in mathematics (Johnstone et al., 2001). This indicates that motivation then, must come from an intrinsic source rather than from simply a teacher or parent, as a child with high self-efficacy would be deemed to perform well in both subject areas. This is supported by Lavigne et al. (2007) who state that self-determined motivation influences students. So it is this belief in one’s ability to accomplish task and high achievement in a subject that acts as a driving force behind the selection and success in the subject of choice. Students who have a positive attitude (Von Secker, 2004) and high self-efficacy due to other positive past experience also tend to have a high science self-belief (Areepattamannil et al., 2010).

Logically one cannot expect students who want to pursue a career in accounting to major in science. Therefore, self-efficacy has also associated with career goals as a
source of motivation. Students who have clear career goals in mind often have very
good self-efficacy and have high intrinsic motivation as well and therefore make clear
decisions about which course of study they want to pursue (Lavigne et al., 2007).

There are other connections that can be established between self-efficacy and essentially
every other factor. These connections will be explored later on in this literature review.

One related experience in the Caribbean is that children who are involved in accelerated
programs are those that generally tend to gravitate towards the sciences. Thus, prior
positive experiences within the primary school system can be linked with increased self-
efficacy and subsequently increased motivation and inclination toward the study of
science. A number of other studies also pinpoint that gender is another factor that has an
influence on science selection.

**Gender**

Expectedly, gender has also been cited as one of the key factors that determine science
selection in adolescents. Ample studies have been implemented in order to examine this
phenomenon. Most have drawn the conclusion that females are generally
underrepresented in science related studies and science related careers (Johnstone et al.,
2001; J. Lee, 2002; Von Secker, 2004). There is apparent gender filtration in science,
most of which occurs at the high school level (J. Lee, 2002). Desy et al. (2011) agree,
stating that females tend to be more anxious about science, less motivated and find
science less enjoyable, while males on the other hand are attracted to science and math
more than their female counterparts. This information is crucial as it indicates that there
is some experience that transpires in high school or maybe prior that results in this
occurrence of gender filtration. Lee (2002) blames the socialization of males and
females, stating that this socialization allows females to focus on social interactions
more than experiment. Correspondingly, females tend to gravitate towards the health
sciences, as opposed to the physical science (Desy et al., 2011). In addition, females
tend to value the input of their significant others (parents and family) more so than
males, thus linking the idea that parents indeed play a considerable role influencing
science selection (J. Lee, 2002).
This may be of some significance for Belize City students and even more so for those at the high school level. Näslund-hadley (2013) reports higher scores in science component for boys for the Primary School Examination (PSE), which is taken upon leaving the primary school system. Therefore, even though there are more girls at the secondary school level (Halcrow Group Limited, 2010), boys may still continue to outperform girls in science.

Barton (1997) reports that once students reach high school or college, most admit that they enroll in science because such courses more than likely required, not because they like science or are interested in learning about science. She takes a feminist perspective, claiming that science has always been restricted to teaching for white, male middle-class heterosexual and has long since excluded females and people from other minorities. This was often representative of the images portrayed in science related materials such as the lack of female representation within the textbooks. This notion is supported by Jacobs & Wigfield (1989) who attribute poor female performance in science with the lack of female role models. The lack of role models in the field of science in Belize continues to be a problem as Belizean representatives, neither male nor female, are not often seen, in this field.

In contrast to all that has been unearthed concerning the lack of infiltration of females in science selection, there has been a marked increase in the pursuance of science by females in Rio de Janeiro, Brazil. This high number of females involved in science in Rio de Janeiro can be attributed to the introduction of science in the form of vocational extracurricular activities (Sousa, Braga, & Frutuoso, 2008). In this study it was also acknowledged that females were more career-oriented than males. This indicates that prior positive exposure, which leads to increased perception of self-efficacy, does indeed enhance an individual’s affinity towards science.

Another perspective that warrants consideration is that of single-sex versus co-ed schooling. Studies concerning the performance of science in co-ed as opposed to single sex schools tend to be rather inconclusive (Pahlke, Hyde, & Mertz, 2013). Yet, it has been established that females enrolled in single-sex institutions tend to outperform those
in co-ed institutions, there is no significant difference in the selection of science as a course of study or a career path (Cherney & Campbell, 2011), indicating that the substructures that play a role in science selection are even more complex. Peer relationships can form a part of the complex substructures and will be addressed next.

**Peer Influence**

Although adolescence is commonly known as one of the stages in an individual’s life in which an individual will be influenced by those that they may recognize as having a close relationship with (Davies & Kandel, 1981; Pajares & Schunk, 2001), researchers have disagreed on the impact that peers have as students choose an academic major.

Peers have been proven to have some impact on academic performance in general (Pajares & Schunk, 2001). Peer influence has a greater impact on certain decisions that adolescence make especially in terms of school programs and college plans (Bain & Anderson, 1974). Students from the same social class tend to make similar plans, but in the case of friends from different social class backgrounds, however, it seems unlikely that they will equally influence each other's attitudes or values. Depending on the social context in which the school exist the assumption would be that those of a higher social class generally tend to have a more profound influence on their peers from a lower class (Bain & Anderson, 1974).

Nelson & DeBacker (2008) have linked socio-economic status and peer influence. These two factors are connected because of the influences of social contexts. Students of low socio-economic status tend to be influenced by their peers more than those of a higher socio-economic status. This study has shown that students generally have three goals that motivate peer influence: 1) social responsibility goals, 2) social intimacy goals, 3) social approval goals. Hence, the influence may be positive or negative which depending on the student’s goal.

The students that are targeted in this study are mostly from Southside Belize which is known to be plagued by poverty and poor living conditions. Because of this there may be instances where students may have negative attitudes towards school and hence result in negative attitudes about challenging subjects are shared among peer groups. This
would result in a dislike for the subject areas such as the se affiliated with the sciences. Adolescents may have a certain perception of what they need to do/be because of where they come from. So they may share the same values as it relates to their ability to perform well in science classes. The school has been known as one of the schools with numerous behavioral problems, which would mean that negative attitudes are common place and often times expected.

Since the reverse may also be true, it may be possible that students choose academic programs which friends select because they have previously fostered positive relationships with those friends and developed positive expectations for their academic program of choice.

Additionally, another study found that during science class, motivation and achievement was found to be positively correlated with the relationship between peers, an example of this would be that students who have friends who value academics tend to perform well. (Bain & Anderson, 1974). Adolescents who perceived being valued and respected by classmates were more likely to report adaptive achievement motivation. (Debacker & Nelson, 2000)

Student reports of having positive science peer relationships were associated with more positive expectations of the possible personal self as scientist prior to the programs, (Stake & Nickens, 2005) this would indicate that there may be both positive and negative perceptions of science among students and whichever one is more dominant would more than likely be indicated by the number of science students that are enrolled in the academic program.

Peer relationship and gender have been shown to be connected as girls tend to have less peer support for their science interests than do boys, which may contribute to gender differences in science motivation (Stake & Nickens, 2005). In many cases at the school, because students are usually expected to have low academic performance so it is quite possible that girls are expected to pursue vocational studies. Within the vocational and technical program at Maud Williams girls usually take food and nutrition, clothing and textile, which exemplify traditional roles that are expected of females.
Connections between Self – efficacy and other factors

Self-efficacy has been demonstrated as being one factor with the most interrelationships. Connections have been established between socioeconomic status, gender, ethnic identity, parent and family background and teacher input. Because of these many interrelationships this section is dedicated to address how self-efficacy connects with the other factors that have been discussed.

Firstly, the connection between self-efficacy and gender has been quite controversial. The findings of Leslie, Mcclure, & Oaxaca (1998) suggest that the perceived importance of the sources of self-efficacy beliefs - mastery experience, and verbal persuasion - may be stronger for women in male-oriented domains than for individuals operating in traditional settings. Women develop a sense of self efficacy at an early age and so whatever values or perceptions that are instilled during the critical years of development may result in either high or low self-efficacy as it pertains to science ability and subsequent science selection. On the contrary, there have also been studies which have anticipated a potential relationship between gender and self-efficacy but no significant relationship has been found between the two (Kiran & Sungur, 2012; Witt-Rose, 2003).

Secondly, the major findings of one study revealed that there is a complex interrelationship between socio-economic status and self-efficacy, ethnic identity, and gender. There were three significant findings which exemplify the complexity of these relationships. The first being that career interest in science is predicted solely by science-mathematics self-efficacy. The second is that self-efficacy is predicted by academic performance and ethnic identity, and thirdly academic performance is predicted by income level (Brien, Martinez-pons, & Kopala, 1999). The authors of this study concluded that there are significant relationships that exist between these four factors. This finding is also supported by another study which found that males with high self-efficacy in mathematics were expected to and often pursued science related majors in college in comparison to their female counterparts (Betz & Hackett, 1983). This decision has been proven to be based on things such as the social class of the students as well as their ethnicity.
Thirdly, there has been a clear connection between self-efficacy and the influence that peers have on each other. Pajares & Schunk (2001) have established several relationships between peer influence and self-efficacy. There are three main types of relationships between these factors. The first being that of modal similarity, which refers to the observation of other’s efforts and success and a sense of self-confidence in an individual. The second being that of peer networks, which is explained by the example peers who have discussions with each other influencing their choice of activity. The third relationship between self-efficacy and peer influence would be that of motivational socialization, whereby children that have been affiliated with highly motivated groups change positively across the school year as opposed to those in less-motivated groups who tend to change negatively.

In addition to these three connections, there have also been further established relationships between parents, self-efficacy and peer influence. This connection involves the involvement of parents as they steer their children toward friends who are efficacious, which would provide a boost in their own children’s self-efficacy (Bandura, 2006; Pajares & Schunk, 2001).

**Chapter Summary**

While there are many studies that look at the factors that influence science achievement, motivation and selection of careers in the science, there is limited literature related to the factors that influence students in making their decision to pursue this area of study, particularly at the secondary school level. In addition, evidence is lacking in terms of exactly which factors influence those students specifically in Belize City. It is this gap in the research literature that has prompted this particular investigation. Therefore, it is expected that this research can be used as a framework that will establish a basis for further research in the country of Belize.

Parents and family background, teacher, self-efficacy and gender and peers all play a role in students’ decision making process, which more likely than not will eventually determine the course of an adolescents’ life. The factors that the literature has thus far explored have all been shown to be interrelated in a number of ways. When considering
all these factors, self-efficacy has multiple relationships among all the factors. It is my intention to investigate these factors using an exploratory approach to determine which of these factors are more influential for students as they decide on pursuing science as their academic program of choice at Maud Williams High School.

The next section will address the methodology and methods used to conduct this study.
Chapter 3: Research Methodology

Introduction

The purpose of this study is to determine which factors influence the selection of science as an academic program. This chapter will describe the procedures that were used to answer the research questions stated in chapter 1.

This section will also provide a rationale for the selection of specific data collection methods that has been utilized for this research project. It will explain the processes that were utilized to collect data and the methods used to analyse the data that was collected for this research. In addition it will give a brief description of the sample that was targeted for this research. Finally, it will close with an explanation of the trustworthiness of the research methods and instruments.

Mixed Methodology

The mixed methodology approach is one which utilizes a combination of both qualitative and quantitative analysis. Qualitative methods include data collection methods such as interviews, discussions and participant observation, and representing it from the perspective of the research participant(s) (Tilford, 2003), while quantitative data collection refers to the collection of data that are strictly nominal or ordinal in nature (Baron, 2008). Therefore, mixed methodology allows for the employment of a variety of data collection techniques from both research paradigms.

Justification of Methodology

Mixed methodology was the approach that was utilized to undertake this study. Mixed methodology has been applied to many areas of discipline, inclusive of both the sciences and social sciences. Many researchers have leaned towards this methodology as it allows some flexibility in data collection methods and research paradigms. “Mixed methods research provides strength that offset the weaknesses of both quantitative and qualitative research” (Clark, 2010; p.12). This avenue of data collection is beneficial because it allows the problem to be examined from a broader perspective and not
limited to merely numerical findings. The convergent design lends to the collection of both quantitative and qualitative data simultaneously in order to gain feedback on one particular phenomenon (Leedy & Ormrod, 2012).

Clark (2010) gives a number of scenarios in which mixed methods would be valuable. Two such reasons would justify the use of mixed methods in this situation. The first reason is that the research is of an exploratory nature, and therefore allows for a combination of two types of data collection techniques. The second is that the type of data gathered from one level of the institution (teacher/staff) may differ from another level (students). It is for these two reasons that this methodology was selected.

Exploratory Research Design

It is essential to establish the approach that the study utilises. In order to investigate the selection of science as a major by students at Maud Williams High School – an area which has never been studied before - an exploratory research design was utilized. Exploratory research can be used to study areas in which there has been no previous investigation and also to consider the different aspects of a particular study. The utilization of this design encompasses the use of an experience survey which gathers insight from those who have direct experience with the problem. This is done so that relationships can be established between variables relating to the research problem (Kothari, 2011).

In order to investigate the factors that influence the selection of science at Maud Williams High School two different surveys were distributed. Next a description of both surveys that were distributed as well as a description of the sample that was selected for the survey.

Survey Method

“Survey research can be defined most simply as a means of gathering information, usually through using questionnaires or interviews” (Marris & Lapan, 2004 p.449). Two types of questionnaires were used to collect data from two different groups. The first group being teachers or members of staff and a representative of the Ministry of
Education and the second group comprised of third and fourth form students. The results were then analysed using both quantitative and qualitative data analysis methods.

This first online survey was prepared on SurveyMonkey. This is an online survey service that allows for the development and distribution of surveys as well as the analysis data that was collected. The data was then downloaded to statistical software for further statistical analysis.

The second survey was also designed on SurveyMonkey.com but eventually distributed in-person to those students who had gained consent from their parents to fill out the survey. The surveys were collected and responses manually uploaded to surveymonkey.com for further compilation, organisation and analysis.

**Benefits and Criticism of Survey**

One common criticism of quantitative scales/instruments is that they are useful for identifying the nature of the problem but not helpful in identifying a specific problem, (Munn & Drever, 1990) therefore a combination of both types (qualitative and quantitative) will be used to acquire a well-rounded understanding of the problem and also used a measure counter this short-coming.

The advantages of using questionnaires include anonymity of respondents, possibility of a high return rate and efficient use of time (Munn & Drever, 1990). These reasons demonstrate the suitability of using a questionnaire in this research. The ease and efficiency of data collection and analysis was also enhanced by developing an online questionnaire.

**Survey 1**

It is common of exploratory research to utilize a two part survey system. This first questionnaire was geared towards teachers and/or Ministry of Education representatives. This qualitative part of the study, entitled Science Selection Teacher Survey, consisted of ten (10) open ended questions and was sent to specific people who were accessible and available at the time of survey development and distribution (Appendix A).
This initial qualitative instrument that was distributed was sent to teachers and the vice principal of the school, who was the former head of the department for the Academic Science Program. It was also sent to two Ministry of Education representatives of which one response was received. There were also survey responses from one non-science teacher who serves as a representative for the Belize Teachers Union and one former science teacher of the school as well as a former science teacher. A summary of the Sample 1 is given in Table 2.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent A</td>
<td>Curriculum Officer of MOE</td>
</tr>
<tr>
<td>Respondent B</td>
<td>Vice Principal and former HOD for Science at MWHS</td>
</tr>
<tr>
<td>Respondent C</td>
<td>Teacher at MWHS and Union Representative</td>
</tr>
<tr>
<td>Respondent D</td>
<td>Former Science Teacher at MWHS</td>
</tr>
</tbody>
</table>

Survey 2

The second survey instrument was also a questionnaire. Because of the necessity to comprehend the experience and its impact on the students decision making process at Maud Williams High School an experience survey was designed. The questionnaires were distributed to third and fourth form students at Maud Williams High School. This distribution of questionnaire is deemed as reasonable as it targets the students who have already selected their academic program. The design of the survey was modelled from the Student’s Motivation Toward Science Learning survey, developed by Tuan, Chin, & Shieh (2005) which was tested on 1407 students of various grades and levels of achievement.

This survey entitled “Science Selection Survey” consists of four sections, A through D. The questionnaire’s four sections are: demographic information, socio economic status, 30 Likert scale questions and 3 open ended questions. Each section is geared to collect a
specific type of data. Likert scale type questions are were used since such scales have been widely used and extensively trialed, and are the major feature of research in this education domain (Leedy & Ormrod, 2012). The following is a brief description of Survey 2 (Appendix B).

- Section A - Demographic Information, consists of five (5) items gender. The items in this section were language, age and academic program.

- Section B - Socio-economic Status. This section had another set of questions concerning whether students come from single or two parent home, their parents/guardian level of education, parents’ occupation and student involvement in extracurricular activities.

- Section C - Likert scale type questions with 8 sub sections. Each subsection had items geared at testing the specific variables within each factor that is being investigated. These sections are shown in Table 3.

<table>
<thead>
<tr>
<th>No.</th>
<th>Section Title</th>
<th>No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Self-Efficacy and Motivation</td>
<td>5 items</td>
</tr>
<tr>
<td>ii.</td>
<td>Parental Influence</td>
<td>4 items</td>
</tr>
<tr>
<td>iii.</td>
<td>Previous Science Experience</td>
<td>5 items</td>
</tr>
<tr>
<td>iv.</td>
<td>Previous Science Performance</td>
<td>4 items</td>
</tr>
<tr>
<td>v.</td>
<td>Peer Influence</td>
<td>3 items</td>
</tr>
<tr>
<td>vi.</td>
<td>Science Language and Understanding</td>
<td>3 items</td>
</tr>
<tr>
<td>vii.</td>
<td>Teacher Influence</td>
<td>3 items</td>
</tr>
<tr>
<td>viii.</td>
<td>Performance in other Subjects</td>
<td>3 items</td>
</tr>
</tbody>
</table>
Section D – Had three (3) open ended questions. The first item in this section asked the students to rank their choice of academic programs prior to selection. The third item asked students to state which item was the most popular or exciting. The third item asked directly who the participant believe had the most influence in the selection of their academic program.

**Participants of Survey 2**

Purposive sampling was utilized for the recruitment of participants for this portion of the research. It was purposive since the population that was targeted was for one specific school. For this particular study a non-probability convenience sample was utilized due to the ethical considerations necessary for this study, as school policy and the requirements for the University of the South Pacific demands parent consent forms be signed for students.

Recruitment was done within a two day process. One day was given for students to take home their parent consent form and ascertain permission from their parents or guardian in order to participate in the study. On the second day the survey was distributed and those that had received permission participated by responding to the questionnaire items accordingly.

The sample selected was very specific for this study, meaning all students were exclusively Maud Williams High School, third and fourth form students.

The sample was selected using a non-probability convenient sampling method. Parents were sent consent forms for approval in order to meet the criterion for an ethical research project. So although the target audience was initially the entire population, it was anticipated that only a portion of students would participate i.e. those students whose parents gave them permission. The selection of participants was done in this fashion because this particular sample was convenient, and they represent the characteristics of the population that was targeted.
Exploratory factor analysis

An exploratory factor analysis was utilised for the quantitative part of this study. This was chosen because of the heuristic nature of this technique (Williams, Brown, & Onsman, 2012). Since there has been some speculation about existing factors, but there has been no such study that has investigated why students tend to be geared towards the selection of science, general conclusions cannot be drawn from this research, but rather preliminary, exploratory findings can be reported in an effort to provide a foundation for further study and precursory recommendations.

A copy of the written survey was also designed on SurveyMonkey.com and the data was manually entered on that particular website. This allowed for convenient transfer of raw data into a spreadsheet in Microsoft Excel and subsequent transference to Statistical Package for the Social Sciences (SPSS) version 21 for statistical analysis.

A number of tests were conducted using chi square analysis, in order to establish relationships or basic associations between the selection of academic majors and the various factors being explored as well as the selection of science as a first choice. In addition, a binary logistic regression was done to measure the factors in term of greatest significance according to academic program.

The qualitative data, responses were gathered from the students through open ended questions to examine their opinion. In addition, an item analysis of the instrument of survey 1, which comprises the quantitative aspect of the study, was conducted. Responses were summarized compared and reported in accordance with each item answered.

Ethical Considerations

This research adhered to regulations outlined in the Human Research Ethics Handbook for the University of the South Pacific. All participants were informed of their rights as participants and in cases where participant were under the legal age to be considered an adult, consent forms were sent home to their parents/guardians, requesting permission for each child’s participation.
Participants of Survey 1 were presented with a participant information sheet (See Appendix A) prior to answering the questions that followed. For Survey 2, a letter of permission was sent via email to the Principal to initially gain permission from the administration to conduct the research at Maud Williams High School (See Appendix C). This letter explained the purpose of the research and any procedures that the researcher intended to take. It is also the policy of the school that if any information should be collected from students, parental consent must be given. Therefore, a consent form was sent to the parents/guardian of each students third and fourth form (See Appendix D). In addition, survey participants were debriefed on the nature and purpose of the research. They were informed that their rights enabled them to withdraw their responses if they wished to do so after they completed the survey.

Any data that was recorded was secured on the researcher’s personal laptop and confidentiality of the participants was made explicit and was maintained throughout the process.

**Trustworthiness**

As with any research it is essential to establish the validity and reliability of the research instrument. Reliability and validity remain appropriate concepts for attaining rigor in qualitative research (Morse, Olson & Spiers, 2002). This would also hold true for quantitative research. In order to maintain this, both questionnaires were critiqued by several experts in the field of education and research (Baron, 2008). Necessary adjustments were then made to ensure that the instrument was suitable and covered the aims and objectives of this research and had direct relation to the research questions posed. These steps are outlined in Figure 3.
Limitations

With every research paper there are limitations and drawbacks that need to be taken into consideration. Because of the scope of this research the mere fact that it is limited to one secondary school within Belize City is a delimiting factor that must be kept at the forefront. In addition, the method of sampling should also be considered. Because the students had to seek consent from their parents in order to respond to the questionnaire, a reasonable sample, which adequately represented the entire population of third and fourth formers was not attained. Although adequate numbers of science students responded, a small number of students from the Vocational/Technical program and also none from the general studies program participated in this study. Another delimitation of this research is the sample of respondents from the ministry, as well as teachers at the school. The initial survey with accompanying parent consent form was sent to the school via email on October 6th, 2014. It was initially intended for the data to be collected within that same week. Due to technical issues and problems with communication, as well as difficulty in receiving signed consent letters the survey was not completed until November 18th, 2014. Another limitation that was noted was that responses from more teachers, members of the ministry and administrative staff would have definitely added more value to the quantitative aspect of this research.

Source: Research and Consultation Team, 2003
Chapter 4: Results and Analysis

Introduction

This chapter reports the results of the survey questionnaires that were distributed among students, and those that were sent to the various representatives from the school and the Ministry of Education.

It is divided into various sections. The first being a report and analysis of survey one. The second is a report and analysis of the findings based on students response to the final question that was asked in the questionnaire as it relates to their perception of who or what had a direct influence on their selection of their academic program. The third section comprises a quantitative analysis of the questionnaire that was completed by the third and fourth form students. These three sections analyze the most relevant findings of this research. The chapter then concludes with a summary of the major findings.

Qualitative Results

Survey 1

The responses of the responses from Survey 1 are presented below.

Q3: How important do you believe science is in our educational system? Why?

All respondents viewed science as being extremely important or very important. For most of them, it is important for problem solving, critical thinking, decision making, and ultimately the development of a nation. In addition, one respondent stated that science focuses on and is necessary for the world around us.

Q4: If you are a teacher, how much priority do you believe science has been given at your school? Why?

Since this question targeted staff and teachers, there was no response from the ministry representative. This question yielded conflicting responses. One respondent indicated that there is some significant effort placed into science education at the school. According to her, this was seen through the offering of Integrated Science at all
levels. In addition, every year, the science department campaigns to the second form classes to encourage them to take science majors in third form. On the contrary, another respondent stated that there is little effort placed in promoting science. To her, little attention (rating 1.5/5) has been given to science. Furthermore, another respondent also agreed that less priority was given to science because insufficient resources were invested or available to teachers.

Q5: How much priority do you believe science been given by the Ministry of Education? Why?

According to one respondent, the education system is heavily influenced by politics, therefore there is not much interest placed in science. One respondent stated that most attention is geared toward Math and English since PSE (Primary School Examination) and CSEC (Caribbean Secondary Education Certificate) science grades are generally good.

Other respondents also agreed that the effort placed in providing sufficient resources to schools by the Ministry of Education was insufficient. Noted by another respondent was the fact that much was not done since insufficient opportunities for international study exist. Evidently, this participant viewed international study as the only option for advancement in studying the sciences.

Q6: What have you observed in terms of teachers’ attitudes to science?

Observation of teachers’ attitude toward the teaching of science varied. One respondent stated that some teachers teach with only notes, making science boring or uninterested. Even so, another perspective was that teachers at the high school level are confident in their ability to teach science since it is their area of specialization. However, teachers’ passions were thwarted by their need for more support acquiring equipment and other resources. The same sentiment was reiterated by the former teacher who said she loved teaching science but could do much more if she had more technology was provided.
Q7: What have you observed in terms of parents’ attitudes toward science?

One respondent was unsure of parents’ attitude to science, but believed that parents want their children to do well regardless of subject area. While another believed that the parents’ interest in children’s education is generally lacking, the others noted also that parents just see sciences as a part of school. Moreover, another respondent believed that parents gave little interest specifically to science subjects irrespective of their general interested in the children’s school work.

Q8: What do you believe are the factors that influence students to choose science as an academic major?

One respondent stated that academic competence (self-efficacy) was the main factor that influences students in the selection of science as an academic major. In addition to this, other factors linked to self-efficacy were stated. The first was the perception that only ‘smart’ students are drawn towards the selection of science especially as many students have the preconception that subjects like Math is too hard. This therefore makes them create a mental block without trying sometimes. Secondly, classroom experiences, such as encouragement from a teacher or poor experiences with science were influential. Thirdly, future career aspirations, gender and/or ethnicity and finally influence from friends were also mentioned.

Q9: At what point in our education system do you believe students liking or enjoyment science is developed or instilled?

The general consensus from respondent was that affection for science developed at either elementary school and/or first form and was dependent on the parents’ support from primary school. One the other hand, one stated that students’ interest could mostly arise in second or third form when they become “more aware of their desired field of study. This was agreed upon by one other respondent.
Q10: Do you believe that science in our secondary schools need improvement? Why/why not?

According to the respondents there is a lot of room for improvement in the secondary school system. The representative from the ministry of education stated that from his experience and observation few students choose science as an academic major. One respondent from the school believed that improvement is needed especially in the teaching methods. This could be achieved through inquiry based model which makes it more interesting. To this respondent, both improvement in methodology and the curriculum, specifically in the inclusion of technology could bring a significant change.

Survey 2

This portion summarizes the responses of Survey 2. It compares the results by academic program and then summarize the responses that were given specifically by the academic science students.

Q: What/who do you believe had the most influence on you choosing your academic program? Why?

According to both the science and non-science respondents, parent or family influenced students in two forms. The first was through their instruction or encouragement and the second through their previous experience in the subject area (Table 4).
Table 4: Parental or Family Influence

<table>
<thead>
<tr>
<th>Factor</th>
<th>Academic Program</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent/family – experience in subject area</td>
<td>Vocational/Technical</td>
<td>My father because he is a technician in Los Angeles</td>
</tr>
<tr>
<td></td>
<td>Academic Science</td>
<td>I would say my sister because she took the program as well and she told me it is interesting and fun.</td>
</tr>
<tr>
<td></td>
<td>Academic Science</td>
<td>My sister and my mom had the most influence on me because they all took it when they were going to high school and they made it sound so fun I wanted to take it badly</td>
</tr>
<tr>
<td></td>
<td>Academic Science</td>
<td>My uncle because he pushed me to work hard to get where I am today</td>
</tr>
<tr>
<td></td>
<td>Academic Science</td>
<td>My parents because they want me to be a doctor or nurse.</td>
</tr>
<tr>
<td></td>
<td>Business</td>
<td>My grandmother because she tell me to go for my dreams because you can do the other subject at any other school</td>
</tr>
</tbody>
</table>

In other cases, motivation, in terms of career aspirations, was shown to have been the most influential factor (Table 5).
### Table 5: Career Motivation

<table>
<thead>
<tr>
<th>Academic Program</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational/Technical</td>
<td>Business because I wanted to be an electrician</td>
</tr>
<tr>
<td>Academic Science</td>
<td>The career, the person I wanted to be in my life lead me to choose this academic program, so I influence myself.</td>
</tr>
<tr>
<td>Business</td>
<td>No one influence me to choose because I want to have my own business</td>
</tr>
<tr>
<td>Business</td>
<td>No one influence me to choose because I want to have my own business</td>
</tr>
</tbody>
</table>

The influence of parent and family instruction occurred, not only by itself, but also in conjunction with other factors. This was especially obvious among the science students. Parental/family instruction or encouragement was often linked with personal motivation especially as it was related to future career goals. Table 6 shows some of the responses of students from each group that mentioned both parental/family influence or encouragement and personal motivation such as career choice.
Table 6: Parental Influence and Career Motivation

<table>
<thead>
<tr>
<th>Academic Program</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>My mother because she wants me to be an accountant</td>
</tr>
<tr>
<td></td>
<td>Parents because they first asked me what I would like in the future and I want to study math or work in a bank. So I made a choice of business</td>
</tr>
<tr>
<td>Academic Science</td>
<td>My mom and dad because I want to be a doctor or nurse and to be that you have to take biology and chemistry so that's the reason why she told me or influence me</td>
</tr>
<tr>
<td></td>
<td>My mom because I want to become a fire chief in the future and she pushes me to take the science courses because that's easier for me moving on to become a fire chief</td>
</tr>
</tbody>
</table>

Several respondents also reported that self-efficacy played a major role in their selection. They used expressions like ‘I love science’ and ‘I wanted to challenge myself.’ They were very much aware and confident in their ability to do science. Although some acknowledged that science does indeed pose a challenge, their own personal ability (which would also be reflected in their grades) motivated them to pursue the subject. In some cases, this self-efficacy was supported by parents/family backgrounds. However, academic science majors and some business students stated only self-efficacy as their influential factor.

Some respondents chose science not only because their self-efficacy but also because they love it. In other instances several connections were observed among the factors. Such connections were parent/family influence, grades, peers self-efficacy and family (Table 7).
Table 7: Multiple Influencers

<table>
<thead>
<tr>
<th>Factors</th>
<th>Academic Program</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent and grades</td>
<td>Business</td>
<td>My parents had the most influence because they saw my grades and thought that I would be good at it.</td>
</tr>
<tr>
<td>Peer influence, self – efficacy and parent/family influence</td>
<td>Business</td>
<td>My friends because most of them said it is hard to do and if it would be difficult and I love challenges and competitions and I also took business because my big sister did.</td>
</tr>
<tr>
<td>Parent/family – experience in subject area and self</td>
<td>Academic Science</td>
<td>My parents because they have my time and plus I have potential in my school work</td>
</tr>
</tbody>
</table>

Surprisingly, the factor that attained the least number of responses was that of the teacher influence as only three respondents confirmed that their selection of science was directly influenced by particular teachers. This influence was because the student perceived the teacher as being very understandable which learning the subject more enjoyable.

Science students alone disclosed four main factors of influence. For a majority of them, parental influence played a key role. This parental influence was expressed through previous experiences in the subject area, encouragement and career motivation. Other factors were self-efficacy, positive self-belief regardless of the challenge and teacher influence. Teacher influence, though listed as a factor was only stated by one respondent.

Quantitative Analysis

This section explores the findings of the quantitative portion of the survey and addresses the research questions two and three.
Table 8 shows the demographic characteristics of students at Maud Williams High School.

**Table 8: Demographic Characteristics of students at Maud Williams High School**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>% (n=49)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class or Form</strong></td>
<td></td>
</tr>
<tr>
<td>Third form</td>
<td>57.1 (28)</td>
</tr>
<tr>
<td>Forth form</td>
<td>42.9 (21)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>57.1 (28)</td>
</tr>
<tr>
<td>Female</td>
<td>42.9 (21)</td>
</tr>
</tbody>
</table>

Overall, 119 students comprising 17, 47, 41 and 14 from Academic Science, Vocational and Technical, Academic Business and General Studies, respectively were enrolled. Forty-nine (49) consisting of 21 (42.86%) fourth form and 28 (57.14%) third form students responded to the survey. Of the respondents, 28 (57.14%) were males and 12 (42.86%) were females.

Among the respondents, 14 (82.4%), 5 (10.6%) and 30 (73.2%) were from Academic Science, Vocational and Technical Programme and Academic Business, respectively. None of the respondents were in the General Studies program (Table 9).
Table 9: Participants According to Academic Program

<table>
<thead>
<tr>
<th>Academic Program</th>
<th>No. of 3\textsuperscript{rd} form students</th>
<th>No. of 4\textsuperscript{th} form students</th>
<th>Total No. of students in program</th>
<th>Survey respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Science</td>
<td>9</td>
<td>8</td>
<td>17 (45%)</td>
<td>14 (82.4%)</td>
</tr>
<tr>
<td>Business</td>
<td>23</td>
<td>18</td>
<td>41 (34%)</td>
<td>30 (73.2%)</td>
</tr>
<tr>
<td>Vocational and Technical</td>
<td>26</td>
<td>21</td>
<td>47 (39%)</td>
<td>5 (10.6%)</td>
</tr>
<tr>
<td>General</td>
<td>0</td>
<td>14</td>
<td>14 (12%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>119 (100%)</td>
<td>49 (41%)</td>
</tr>
</tbody>
</table>

In terms of students’ first language, a majority (32 that is, 65.31 \%) spoke Kriol (Creole) followed by English, 13 (26.53\%) Garifuna 3 (6.12 \%) and Spanish 1 (2.04\%) (Figure 4).

Figure 4: Graph showing first language of participants

![Graph showing first language of participants](image)

The ages of the students that responded to the questionnaire ranged from 14-19 years and their mean age was 16.43 years (SD= 1.118). Among the respondents, a majority, 17 (35 \%) were 16 years old. Seven (14\%), 13 (27\%), 8 (16\%) and 1 (2\%) of the respondents were 15, 17, 18 and 19 years old, respectively (Table 10).
Table 10: Showing Respondents age and percentages

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>15</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>35%</td>
</tr>
<tr>
<td>17</td>
<td>13</td>
<td>27%</td>
</tr>
<tr>
<td>18</td>
<td>8</td>
<td>16%</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>SD =1.118</td>
</tr>
</tbody>
</table>

**Gender, Language and Science Selection**

There existed no real statistically significant difference between gender and students’ choice of an academic program. Similarly statistically significance was not achieved when the relationship between participant’s first language and student’s current program was assessed. At least 50% of the students sampled pursued business courses (Table 11).
Table 11: Cross tabulation between gender, language and academic program

<table>
<thead>
<tr>
<th>Gender</th>
<th>Academic Science</th>
<th>Vocational /Technical</th>
<th>Business</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>25.0 (7)</td>
<td>17.9 (5)</td>
<td>57.1 (16)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>33.3 (7)</td>
<td>0.0 (0)</td>
<td>66.7 (14)</td>
<td>0.121</td>
</tr>
</tbody>
</table>

**Students’ first language:**

<table>
<thead>
<tr>
<th>Language</th>
<th>Academic Science</th>
<th>Vocational /Technical</th>
<th>Business</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kriol</td>
<td>25.0 (8)</td>
<td>12.5 (4)</td>
<td>62.5 (20)</td>
<td>0.897</td>
</tr>
<tr>
<td>Spanish</td>
<td>0.0 (0)</td>
<td>0.0 (0)</td>
<td>100.0 (1)</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>33.3 (4)</td>
<td>8.3 (1)</td>
<td>58.3 (7)</td>
<td></td>
</tr>
<tr>
<td>Garifuna</td>
<td>50.0 (2)</td>
<td>0.0 (0)</td>
<td>50.0 (2)</td>
<td></td>
</tr>
</tbody>
</table>

**Extracurricular activity and selection of science**

No statistically significant relationship existed between the participation in extracurricular activities and the selection of specific academic programs (Table 12).

Table 12: Cross tabulation of student involvement of extracurricular activities and students choice of academic program

<table>
<thead>
<tr>
<th>Extra-curricular activity</th>
<th>Academic Science</th>
<th>Vocational /Technical</th>
<th>Business</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>30.8 (8)</td>
<td>15.4 (4)</td>
<td>53.8 (14)</td>
<td>0.360</td>
</tr>
<tr>
<td>Yes</td>
<td>26.1 (6)</td>
<td>4.3 (1)</td>
<td>69.6 (16)</td>
<td></td>
</tr>
</tbody>
</table>
Parent involvement, parent education level and selection of academic program

No significant difference existed between students’ selection of program and their parental status (living with one or all parents). There was also no statistical significance between the level of education of the parents and the selection of academic program by their children.

Table 13: Cross tabulation between students’ current academic program and single parent home and parent level of education

<table>
<thead>
<tr>
<th>Single Parent</th>
<th>Students’ current academic program</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Academic Science</td>
<td>Vocational/Technical</td>
</tr>
<tr>
<td>No</td>
<td>31.3 (5)</td>
<td>18.8 (3)</td>
</tr>
<tr>
<td>Yes</td>
<td>27.3 (9)</td>
<td>6.1 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent/Guardian Highest Education</th>
<th>Students’ current academic program</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Academic Science</td>
<td>Vocational/Technical</td>
</tr>
<tr>
<td>Primary School</td>
<td>20 (2)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>High School</td>
<td>33.3 (10)</td>
<td>6.7 (2)</td>
</tr>
<tr>
<td>Sixth Form</td>
<td>33.3 (2)</td>
<td>33.3 (2)</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>0 (0)</td>
<td>50 (1)</td>
</tr>
<tr>
<td>Master’s/PhD</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Popularity of Science vs. Gender

A higher percentage of males perceived science to be more popular, while a higher percentage of females perceived business to be more popular. Although academic science had the second largest percentage of students who responded to the survey it
must be noted no statistical significance existed between its perceived popularity and gender (Table 14).

Table 14: Popularity of Science vs. gender

<table>
<thead>
<tr>
<th>Students’ Perceived Popularity of Academic Programs % (n=49)</th>
<th>Academic Science</th>
<th>Vocational/Technical</th>
<th>Business</th>
<th>General Studies</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participants Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.709</td>
</tr>
<tr>
<td>34.6 (9)</td>
<td>11.5 (3)</td>
<td>50 (13)</td>
<td>3.8 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 (5)</td>
<td>5 (1)</td>
<td>65 (13)</td>
<td>5 (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perceived popularity of science and actual enrolment in academic program

There existed no statistical significance between the students perceived popularity of science and the actual enrolment of students in a program (Table 15)

Table 15: Perceived popularity of science and actual enrolment in academic program

<table>
<thead>
<tr>
<th>Academic Program</th>
<th>Students’ Perceived popularity of academic programs % (n=49)</th>
<th>Academic Science</th>
<th>Vocational/Technical</th>
<th>Business</th>
<th>General Studies</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38.5 (5)</td>
<td></td>
<td>7.7 (1)</td>
<td>46.2 (6)</td>
<td>7.7 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocational/Technical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.5 (1)</td>
<td></td>
<td>25 (2)</td>
<td>50 (4)</td>
<td>12.5 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.3 (6)</td>
<td></td>
<td>4.5 (1)</td>
<td>68.2 (15)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 (2)</td>
<td></td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Factors of Significance in each academic program

Self-efficacy and motivation were significantly associated (P = 0.028) with the selection of academic program. Confident students were 8.007 times more likely to pursue science as their academic program. Other factors had no significant influence on the selection of academic program (Table 16). Based on previous science experience those in the sample proved to be 3.732 times more likely to select science as their academic program of choice although there was no statistical significance. In the same way, those who had high scores in the previous science performance category were 2.964 times and those influences by peers were 3.06 times more likely to select science.

Similarly, based on science language and understanding, students were 2.9 times less likely to select science. Furthermore, those with high levels of teacher influence were also found to be 1.8 times less likely to be enrolled in science. Those with high performance in areas including math, English and their respective academic program also showed a 3.584 diminished chance of taking science.

Table 16: Binary linear regression of factors in comparison to academic program of choice

<table>
<thead>
<tr>
<th>Factor</th>
<th>P</th>
<th>Exp B</th>
<th>95% CI (Exp B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Self-Efficacy and Motivation</td>
<td>0.028</td>
<td>8.007</td>
<td>1.247</td>
</tr>
<tr>
<td>Parental Influence</td>
<td>0.819</td>
<td>0.829</td>
<td>0.167</td>
</tr>
<tr>
<td>Previous Science Experience</td>
<td>0.160</td>
<td>3.732</td>
<td>0.595</td>
</tr>
<tr>
<td>Previous Science Performance</td>
<td>0.296</td>
<td>2.964</td>
<td>0.386</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>0.207</td>
<td>3.060</td>
<td>0.538</td>
</tr>
<tr>
<td>Science Language and</td>
<td>0.209</td>
<td>0.345</td>
<td>0.065</td>
</tr>
<tr>
<td>Understanding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Influence</td>
<td>0.491</td>
<td>0.535</td>
<td>0.090</td>
</tr>
<tr>
<td>Other Subjects</td>
<td>0.198</td>
<td>0.279</td>
<td>0.40</td>
</tr>
</tbody>
</table>
Peer influence and selection of academic programs as a first choice

Among all factors listed in the survey, only peer influence had statistically significant effect (p=0.025) on the selection of science (Table 17).

Table 17: Cross tabulation between peer influence and selection of academic programs as a first choice

<table>
<thead>
<tr>
<th>Academic Program</th>
<th>Peer Influence</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Academic Science</td>
<td>35.7 (5)</td>
<td>64.3 (9)</td>
</tr>
<tr>
<td>Vocational/Technical</td>
<td>12.5 (1)</td>
<td>87.5 (7)</td>
</tr>
<tr>
<td>Business</td>
<td>65.2 (15)</td>
<td>34.8 (8)</td>
</tr>
<tr>
<td>General Studies</td>
<td>0 (0)</td>
<td>100 (2)</td>
</tr>
</tbody>
</table>

Comparison of science experiences and science performance in primary school vs. high school

Results of cross tabulation showed a significant relationship (p=0.00) between the science experiences in primary school and those in first and second forms. Majority of the respondents (n=27) agreed that both their science experiences in the first portion of secondary school as well as primary school were positive. There were 20.4% of the sample who disagreed that their science performance was enjoyable, while 10.2% of the total number of respondents who had an enjoyable experience in second form had the opposite experience in first and second form (Table 18).
Table 18: Crosstab between experiences of students in primary school vs. Experience in first and second form

<table>
<thead>
<tr>
<th>Enjoyable science experience in primary school</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Agree</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Opinion</td>
<td>50 (1)</td>
<td>0 (0)</td>
<td>50 (1)</td>
<td>0.00</td>
</tr>
<tr>
<td>Disagree</td>
<td>0 (0)</td>
<td>76.9 (10)</td>
<td>23.1 (3)</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>6.1 (3)</td>
<td>14.7 (5)</td>
<td>79.4 (27)</td>
<td></td>
</tr>
</tbody>
</table>

Science understanding in primary school vs. understanding in secondary school

A statistically significant (p=0.015) relationship was established between science understanding in primary school and in first and second form. Similarly to their experiences, more than 50% of students agreed that their understanding of science was positive in both primary and their first half of secondary school as shown in Table 19.

Table 19: Cross tabulation between science understanding in primary school vs. the experience in first and second form

<table>
<thead>
<tr>
<th>Science understanding in first and second form % (n=49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Opinion</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>No Opinion</td>
</tr>
<tr>
<td>Disagree</td>
</tr>
<tr>
<td>Agree</td>
</tr>
</tbody>
</table>
Science grades in primary school and first and second form

There was statistical significance ($p=0.00$) between students’ opinion of their grades scored in primary and secondary school as shown in Table 20.

Table 20: Grades of students in primary school vs. science grades in first and second form

<table>
<thead>
<tr>
<th>Good Science grades in primary school</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Agree</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Science grades in first and second form % (n=49)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>100 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.000</td>
</tr>
<tr>
<td>Disagree</td>
<td>0 (0)</td>
<td>75 (6)</td>
<td>25 (2)</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>2.5 (1)</td>
<td>15 (6)</td>
<td>82.5 (33)</td>
<td></td>
</tr>
</tbody>
</table>

Fun and interesting science teacher vs. science participation in primary school

Although more than half of the participants reported having positive experiences in both primary school and high school, there existed no statistical significance (Table 21).

Fun and interactive science teacher vs. science participation in primary and secondary school

There was no statistical significance between the factors of having fun and interactive teachers and science in both primary and secondary school (Table 21).
Table 21: Comparison of cross tabulation between fun and interactive science teacher vs. science participation in primary and secondary school

<table>
<thead>
<tr>
<th>Fun and interactive science teacher</th>
<th>Science Participation in primary school % (n)</th>
<th></th>
<th></th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Opinion</td>
<td>Disagree</td>
<td>Agree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>(0)</td>
<td>(0)</td>
<td>100 (1)</td>
<td></td>
<td>0.810</td>
</tr>
<tr>
<td>Disagree</td>
<td>(0)</td>
<td>36.4 (4)</td>
<td>63.6 (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>2.7 (1)</td>
<td>21.6 (8)</td>
<td>75.5 (28)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Science participation in first and second form% (n)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Opinion</td>
<td>(0)</td>
<td>(0)</td>
<td>100 (1)</td>
<td></td>
<td>0.388</td>
</tr>
<tr>
<td>Disagree</td>
<td>9.1 (1)</td>
<td>36.4 (4)</td>
<td>54.5 (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>5.4 (2)</td>
<td>21.6 (8)</td>
<td>73 (27)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chapter Summary

The results of both the qualitative and quantitative portions of this study yielded quite similar results. The respondents of survey 1 mostly attributed self-efficacy as the main factor that influenced the selection of academic major, especially the sciences. In addition, they generally noted that teachers are given insufficient support and resources at the level of both the ministry and school. Within the qualitative portion of survey 2, major factors of influence included, self-efficacy and motivation and parent or family influence. The quantitative portion of this study yielded a number of statistically significant findings. These findings were: self-efficacy and motivation, peer motivation and influence, and science experience and understanding in primary school as well as first and second form. None of the various categories reported teachers’ influence as a
significant factor in their selection of academic program. These main points of interest will be synthesized and further addressed in the subsequent chapter.
Chapter 5: Discussion and Conclusion

Introduction

This section examines the results of this study and compares the major findings. The first section discusses the major findings of this research and their significance. The second portion looks at the implications of this research as well as its contributions to the current literature within this field of study. The third section makes recommendations to the school and states the areas for further study. The final section brings this study to a close by summarizing the major findings of this research.

In this study trends were observed on the likelihood of selecting science as an academic program. Those trends provided some insights into the experiences of students that participated in the study. A few outstanding elements were noted when the results of both the qualitative and the quantitative portions of the study were compared. These included statistical significance between self-efficacy and motivation and selection of academic program, peer motivation and science selection, experience with science in primary school and the first part of secondary school, and science understanding in both primary and secondary school. Furthermore, both the qualitative and quantitative sections showed the absence of teacher influence. Other notable factor included, family/parental influence and trends in the opinion of science based on gender and conﬂiction views on the interest in science from the government and the school.

Science as Priority

Science, which was the main focus of the study was acknowledge by all the respondents as being extremely important with the central reason being development of or nation. Both science and technology have previously been viewed to have profound effects on the economic and social objectives of developing nations” (Searles, 1986; p. 486) Because of the agreement of its signiﬁcance, it would therefore it would be expected that it is given much priority within our school system.

Although the importance was acknowledged, 75 % of the respondents believed that less priority was given to it. These respondents probably have that perception due to the
small numbers of science students that continue to enter third form. If the sciences are promoted then there must be other reasons students are not being enrolled in the classes at the school. This general consensus is supported by (Näslund-hadley, 2013;p.12) “The percentage of standard six students who earned a grade of competent or better on the science and social studies sections was more than twice as large as the percentage with similar scores on the mathematics and language sections (15 percent)”. Since there has been such positive results in our PSE, on a national level, the question then lies as to why there is such a decline, in the interest of science at that particular school. One aspect to consider then would be the previous science performance therefore of those particular students at the school need to be taken into consideration. In addition, as stated by another respondent, there has not been enough of an investment in science as it pertains to the provision of resources at the school. It would appear that there needs to be more of a financial investment in science in the schools in Belize, Lack of equipment and labs are a problem.

According to Sjøberg (2002) technology has a vital role to play in the enhancement of science development in schools. Considering that this availability of technological resources within the Belizean educational context itself is in need of improvement this is an issue needed to be addressed on a larger scale. As stated in the Education Sector Strategy for 2011-2016 it is a challenge to better target enrolment in science and technology which is a priority subject area (Ministy of Education and Youth, 2012). Consequently, there would be other implications for tertiary level institutions, since the problem stems from the secondary level.

Several factors which influenced the selection of academic programs are discussed below.

Influence of Self-Efficacy and Motivation

Motivation and self-efficacy as previously mentioned was among the most influential factors and had the most statistically significant role to play in students selecting science as their academic program. This coincided with the quantitative portion of the study where students enrolled in Academic Science continuously reported self-efficacy as
their reason for choosing science. This motivation came mainly in the form of career aspiration. Students claimed that they wanted to pursue being a doctor or some other career related to the field of science. Koul, Lerdpornkulrat, & Chantara (2010) stated that a student's source of motivation is considered to be a predictor of a range of related educational decisions from attending classes to choosing a particular course of study or even a career. This is an important point to note since it portrays the students as those who are aware or have a sound sense of direction as to which career or even which course of study they would want to pursue as they journey towards tertiary school. The notion of goal commitment (Leslie et al., 1998) also holds some significant impact on the choosing of science as an academic major. If students are committed to achieving a particular goal they are more than likely going to take the necessary steps that they are committed to achieving. Having both qualitative and quantitative portions of this study confirming that self-efficacy has a significant role to play as an influencer of science selection is interesting. It is also important to emphasize that motivation in this case was in the form of career aspiration, but other source of motivation existed among the respondents. This additional source of motivation can be linked to parent and family influence.

**Influence of parents and family**

Other sources of motivation came in the form of influence from parents and family. Though these results varied between the qualitative and quantitative results it is still important to note that there was still some measure of likelihood for students to select science based on their parental motivation. Students with increased parental support were found to be 1.2 times less likely to select science as their first choice. However this relationship was not found to be statistically significant.

Many of the students attributed their choice of academic program to their parents’ desire for them and their encouragement of such desires often impacted their motivation towards a particular career (Bain & Anderson, 1974). This is therefore one established relationship between factors and it agrees with the premise that the microsystem of the family acted as a major influencer among the respondents (Bronfenbrenner, 1979, 1994). The results of this study determined two areas in which parents had a significant
impact on their child’s subject choice. The first being parental influence through direct parental instruction.

This means that students from families with single and both parents are equally likely to choose either of the academic programs. There was no statistical significance between the level of education of the parents and the selection of academic program by their children. Majority of students had parents with high school education, and this also shows that they are also equally likely to choose any academic program, regardless of their parents’ educational level.

Influence of Peers

The second notable statistically significant finding was that of peer influence. This aspect was unexpected, because the survey did not yield a large number of respondents stating that they were influenced by their peers. Peer influence has been described as being the missing link (Leslie et al., 1998) as it pertains to the involvement in science related fields. So there is a possibility that students could be unaware of the actual impact that their peers have on the direction that they take in terms of their academic program.

Within the sphere of Bronfenbrenner’s ecological model, these factors are present within the mesosystem (Bronfenbrenner, 1979). According to other studies it is not surprising that motivation, self-efficacy and peer influence were the most outstanding factors (Areepattamannil et al., 2010; Wozniak & Fischer, 1993). Wozniak & Fischer (1993) studied influencers on students using this model and found that peer and family relationships had significant roles to play in regards to students’ decision making. Parents and family had a greater impact on large scale decisions, or long-term decisions. Conversely, peers have more of an impact on day-to-day decision making. This could be a possible explanation to these two factors’ statistical significance in the study.

Primary School and High School Science

Other statistically relevant findings were the samples’ science experience and understanding which were consistent throughout the primary and high school. This also
was not expected and is in contrast with other studies which specifically stated that students, especially females’ interest in science often declines during transition from primary school level to secondary school (Cavas, 2011; George, 2003; Jones, Howe, & Rua, 1999; Osborne et al., 2003).

In addition, the respondents of Survey 1 were of the view that interest in science may be sparked either in primary school or secondary schools, although, high school students may have a clearer idea of what their interests are. This would account for both their positive experiences in high school and primary school that was reported by the students. Their experiences may have been positive, but not necessarily impactful enough to stir up an interest in science at either phase of their academic involvement.

**Teacher Influence**

Among the respondents of Survey 1 there was some consensus on perception that teacher attitude needs improvement. Teachers have the potential of being the most influential factor but it is not reflected in the response of academic science students in this study. In addition, more resources can be invested in making teachers more innovative in their presentation of science which would make it more appealing to students. No statistical significance between the science and other students’ responses with respect to teacher influence on the selection of academic program indicates that teachers have no real impact on students. This is telling as teachers’ role should be of paramount importance in selecting subject areas. In his book on Science Teaching, Matthews (1994) acknowledged the move away from science and outlines three things that science teachers need in order to be impactful science educators. These three necessities can be summarized below:

1. Teachers must have a knowledge and appreciation of science.
2. Teachers must have some understanding of the history and philosophy of science so that they can teach it well.
3. Teachers must have some educational theory or vision that can enhance their classroom activities.
In addition to the above factors, there was an agreed need for improvement in schools in terms of resource availability and investment by Ministry of Education. Furthermore the teaching techniques and approaches need to be improved or altered. Teachers may also need their own source of personal motivation and self-efficacy in order to make better decisions in the classroom in terms of pedagogy, lesson delivery and motivation of students (Kirkpatrick, 2012). This may result in the increase in interest and selection of science. Teachers would have a greater impact on students’ choice of subject major. The impact from teachers is not the sole responsibility of teachers themselves but should be more of a community effort. Beck & Kosnik (2012) describes Vygotsky’s social constructivist theory as being concerned with the effects of the larger society on knowledge formation or the role of learning communities. This concept of learning communities can be extended to the training and development of teachers.

It has been said that teachers are the change agents in educational reform. We believe that teacher beliefs (specifically, capability and context beliefs) are the more precise agents of change. Societal values and actions undoubtedly affect teachers’ capability and context. Teachers cannot and should not take on the sole responsibility of improving the science education of our nation’s youth. Communities must provide teachers with a supportive environment. (Lumpe, Haney, & Czerniak, 2000; pg 288)

**Gender Opinion of Science**

Finally, one other area that was interesting to note was that of gender opinion of the popularity of science. Although there was no statistical significance, it must be noted that more males perceived science as being more popular (almost 2:1 ratio) even though there were more females that were surveyed. It can be speculated that there are probably still some preconceived gender roles that students still adhere to as it pertains to science. Similar findings were reported in a study that gender differences in science related studies, whereby females viewed science as being less engaging than their male counterparts (Desy et al., 2011). This would imply that more can be done in order to make science more appealing to females starting even from the primary school level or even during the early years of secondary school. Parents may also play a role in this
process as they are the main socializers of students and also were shown (qualitatively) to have a major impact on the students’ choice of academic science.

Implications and Significance

This research has much to contribute towards current literature within the field of science education in Belize. This ground-breaking study is the first of its nature to be carried out at Maud Williams High School and in the country of Belize on a whole. It can be used to stimulate discussion among administrative staff to brainstorm ways of increasing motivation toward science, increase awareness of career options in terms of science related fields and garner more support from parents. Although this may be challenging since lack of support from majority of parents has been viewed as a problem at this school for quite some time. There also lie implications for the Ministry of Education in Belize. Implications for Ministry of Education include much needed training and development of pedagogy in science.

Recommendations for School

This research highlighted the areas that are most efficient in encouraging students to study science as an academic major. It also pointed out some need for improvement in specific areas at Maud Williams High School. Since these findings were based on an exploratory data analysis, they are by no means conclusive, but can be used as springboard, to stimulate action towards further research and changes that can be made at MWHS. Here are some recommendations that can be taken into consideration by the administrative staff of the school. Firstly, more research can be done in order to expand on the knowledge base that has already been unearthed by this research. Secondly, there can be more effort placed in promoting science to a combined first and second form at the school, since promotion is done, but only at second form level. Thirdly, more opportunities can also be created, so that there will be students’ awareness of career options or even opportunities for further study. Finally, teachers could become more creative, enthusiastic, constructivist in their approach to teaching, thus stimulating the interest and driving students toward liking and subsequent selection of science. These
suggestions could potentially allow for an increased involvement in academic science at Maud Williams and generally in Belize.

**Recommendations for Further Study**

This study, being the first (known) of its kind within the Belizean context leaves room for much more to be done within the field of science education in Belize. Therefore, recommendations must be made to expand the volume of literature that is available. One recommendation would be that research of this nature could be done on a larger scale at Maud Williams High School and among other schools in Belize City. This could include targeting a larger cohort from the school and/or other school. Also, similar studies that are longitudinal in nature can be undertaken to yield more specific trends and garner more accurate statistical data. Furthermore, an in depth look at students grades and more thorough feedback from teachers and students in the form of interviews as well as observations and examination of attitudes of teachers and students including techniques utilized by teachers could also be conducted given utility of adequate time and resources.

**Conclusion on major findings**

The major findings of this research, though not conclusive, due to its exploratory nature are very telling. It can be used to make preliminary decisions about action that need to be taken and geared toward further research within the school and can also be used too as a stepping stone towards making some preliminary decisions about science in the school. The major findings of this study in relation to the research question included the following. 1. Motivation as it relates specifically towards self-efficacy, positive self-belief and even more so, career expectation were prominent factors. 2. Parental support, self-efficacy, peer influence and career aspirations were found to promote while teacher influence diminished the likelihood of science selection 3. Related factors were self-efficacy, career motivation and peer influence 4. Finally, to promote science as an academic program at Maud William Williams High School, sensitization of students on science and related career options especially by their teachers should be encouraged,
resources should be provided to both teachers and students and science should be promoted to both the first and second form students.
References


Kiran, D., & Sungur, S. (2012). Middle School Students’ Science Self-Efficacy and Its Sources: Examination of Gender Difference. Journal of Science Education and Technology, 21(5), 619 – 630. Retrieved from http://www.jstor.org/cache5.usp.ac.fj:2048/10.2307/41674489?Search=yes&resultItemLink=true&searchUri=action/doAdvancedSearch?f2=all&q4=&amp;wc=on&amp;q1=&amp;c5=AND&amp;q0=self-efficacy+and+student+performance&amp;ed=&amp;q3=&amp;f5=all&amp;q2=&amp;f1=all&amp;acc=on&amp;c6=AND&amp;c2=AND&amp;f6=all&amp;f3=all&amp;c1=AND&amp;f0=all&amp;q5=&amp;pt=&amp;i


APPENDIX A

PARTICIPANT INFORMATION SHEET

Dear Participant:

You have been selected to participate in research project conducted by a Masters student of the University of the South Pacific. This project is entitled: An investigation of the factors that Influence the Selection of Science as an Academic Program: A case study at Maud Williams High School, Belize. I write to seek your assistance in conducting this research by responding to the questions in the following questionnaire.

RESEARCHER: Ms. Tamica Shyanne Codd

PURPOSE OF THE RESEARCH:

The purpose of this study of this is to investigate the relevance of and establish relationships between factors that influence selection of academic science as a course of study at Maud Williams High School and also make recommendations towards the improvement and accessibility of the science academic program at the school

RESEARCH OBJECTIVES:

1. Survey the relevant literatures pertaining to the selection of academic programs in schools.
2. Investigate the relevance of and establish relationships between the factors that influence the selection of academic science as a course of study at Maud Williams High School
3. Make recommendations towards the improvement and accessibility of the science academic program at the school

METHOD AND DEMANDS ON PARTICIPANTS:

The researcher is asking for approximately 15 – 20 minutes of your time. This survey will consist of approximately 20 questions. The questions will be in reference to your perception of the delivery of and attitudes toward the science subjects.
Apart from a maximum of twenty minutes of your time to respond to the questionnaire, the researcher can foresee no risks or discomforts for you and your child. The data gathered will remain anonymous and confidential. Your involvement is voluntary and you reserve the right to withdraw participation from the study at any time and withdraw any data gathered up to that point.

BENEFITS OF THE RESEARCH

The findings of this research will provide a basis for future planning in the school and will also provide a framework for other research to be conducted in other subject areas as well as other schools.

Should you require any further information please do not hesitate to contact:

Tamica Codd

Belizean Researcher at USP

Phone: (679) 931-0489

Email: s11095726@student.usp.ac.fj
APPENDIX B

Science Selection Survey

1. Where are you currently working?
2. What is your position at your place of employment?
3. How important do you believe science is in our educational system? Why?
4. If you are a teacher, how much priority do you believe science has been given at your school? Why?
5. How much priority do you believe science been given by the Ministry of Education? Why?
6. What have you observed in terms of teachers’ attitudes to science?
7. What have you observed in terms of parents attitudes towards science?
8. What do you believe are the factors that influence students to choose science as an academic major?
9. At what point in our education system do you believe students’ affinity towards science is developed/instilled?
10. Do you believe that science in our secondary schools need improvement? why/why not?
APPENDIX C

THE UNIVERSITY OF THE SOUTH PACIFIC

Faculty of Arts, Law and Education

An Investigation of the Factors that Influence the Selection of Science as an Academic Program: A case study at Maud Williams High School, Belize

Questionnaire

PARTICIPANT INFORMATION SHEET

Dear Student:

You have been selected to participate in a research survey conducted by a Masters student of the University of the South Pacific. This project is entitled: An Investigation of the Factors that Influence the Selection of Science as an Academic Program: A case study at Maud Williams High School, Belize. Your assistance in conducting this research by responding to the questions in the attached questionnaire is not mandatory but is greatly appreciated.

Researcher:

My name is Ms. Tamica Shayanne Codd and I am a Belizean student at the University of the South Pacific. I am in the process of completing my Master’s Degree in Education (MEd). This project is being supervised by Dr. Mesake Rawaikela Dakuidreketi of the Faculty of Arts Law and Education (FALE).
About the research:

The purpose of this study is to investigate the factors that influence selection of academic science as a course of study at Maud Williams High School and also make recommendations towards the improvement and accessibility of the science academic program at the school. It is also a partial requirement for my master’s degree at the University of the South Pacific.

Procedures:

This survey will take approximately 20 minutes of your time. The questions will ask about your reasons for selecting your academic program. Some of the questions that the researcher will ask include: Your age, Academic program, your experience in primary school/high school; did your parents tell you which program to take?

Benefits of the research:

The findings of this research will provide a basis for future planning in the school and will also provide a framework for other research to be conducted in other subject areas as well as in other schools.

The data gathered will remain anonymous and confidential. Your involvement is voluntary and you reserve the right to withdraw participation from the study at any time and withdraw any data gathered up to that point.

Should you require any further information please do not hesitate to contact:

Ms. Tamica Codd
Belizean Researcher at USP
Phone: (679) 931-0489
Email: s11095726@student.usp.ac.fj
THE UNIVERSITY OF THE SOUTH PACIFIC

Faculty of Arts, Law and Education

An Investigation of the Factors that Influence the Selection of Science as an Academic Program: A case study at Maud Williams High School, Belize

PARTICIPANT INFORMATION SHEET

Questionnaire

Survey on the Selection of Science as Major

Kindly respond to the following items to the best of your knowledge. All responses will remain anonymous and confidential.

Answer the questions EITHER by ticking (✓) the appropriate box or by writing in the space provided.

Part A: Demographic Information

1. Class/Form:   □  Third Form  □  Fourth Form

2. Age: ________ years

3. Gender:  □  Male  □  Female

4. First Language:  □  Kriol (Creole)
                   □  Spanish
                   □  English
                   □  Garifuna
                   Other _______________

5. Academic Program:  □  Academic Science
                     □  Vocational/Technical
                     □  General Studies
                     □  Business
Part B: Socioeconomic Status

6. Do you live with only one parent/guardian:  □ Yes  □ No

7. Parent's/Guardian's Highest Level of Education:
   □ Primary School
   □ High School
   □ Sixth Form (Associate's Degree)
   □ University (Bachelor's Degree)
   □ University (Master's Degree/PhD)

8. Parent(s)/Guardian(s) Occupation: ________________________________

9. I am involved in extracurricular activities:  □ Yes  □ No

10. If you answered yes to question 9 please list which extracurricular activities you are involved in

   ________________________________
### Part C: Likert Scale Questions

Kindly respond to the following statements by shading ☐ or placing an ☒ over the most appropriate answer for each item.

<table>
<thead>
<tr>
<th>Self-Motivation</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I chose my academic program because I knew I would be good at it</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I chose my academic program because I thought it would be challenging</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I am determined to work hard even if I am struggling in my class</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I am confident in my ability to do science subjects</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I plan to pursue an academic program directly related to my career Path</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parental Influence and Support</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. My parent(s)/guardian told me which academic program to choose</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. My parent(s) usually help me with my assignments (e.g. getting the materials I need or giving me advice when I don’t understand)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I always have all the books and materials that I need for my classes</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. My parents have a background in science</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous Science Experience</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. I enjoyed my science experience in primary school</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. I enjoyed my science experience in first and second form</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. My science previous teachers made science fun and interactive</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. I found science easy to understand in primary school</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. I found science easy to understand in first and second form</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous Science Performance</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. I got good grades in first and second form science classes</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. I got good grades in primary school science classes</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. I participated actively during science classes in primary school</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. I participated actively during my science classes in first and second Form</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Peer Influence</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. My friends suggested that I should take the same academic program they do</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. My close friends and I are in the same academic program</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. In class I prefer learning through interaction with my peers (e.g. Group work)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Science Language and Understanding</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Science terms and concepts are difficult understand</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23. When I take/took science I had trouble understanding the terms and concepts</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Question</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>If science was taught in my first language (e.g. Creole, Spanish etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would better understand it</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. My teacher advised me on which academic program to take</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I chose my academic program because I had good teachers in similar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subject areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. My teachers in first and second form were very knowledgeable in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>teaching science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance in other Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. My grades in English are above 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. My grades in Mathematics are above 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. My grades in my academic program are good so far</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part D: Open Ended Questions

Please answer the following questions:

1. In second form which academic programs did you choose in order of preference?
   1st ______________________________
   2nd ______________________________
   3rd ______________________________

2. Which academic program do you believe is the most exciting or popular?
   ________________________________

3. What/who do you believe had the most influence on you choosing your academic program? Why?
   ________________________________
   ________________________________
   ________________________________
   ________________________________
APPENDIX D

August 12, 2014

Dear Principal:

After initial liaisons with your vice-principal, Ms. Georgia Griffith, I am of the opinion that my research interest to investigate the factors that influence the selection of science as academic programme at Maud Williams High School to be a mutually beneficial project. This project will form part of the requirements towards attaining a Master’s in Education (MEd), at The University of the South Pacific (USP), where I am currently located.

In this regard, I would like your permission and support in facilitating the approval and process of data collection for this research.

The project is tentatively entitled: *Factors that Influence the Selection of Science as an Academic Major: A case study at Maud Williams High School, Belize.*

The research questions that are proposed to be investigated are:

1. What are the prominent factors that influence students at Maud Williams High School when selecting their academic program?
2. What factors or processes promote or inhibit the selection of science and what are the linkages between them?
3. How can these factors be addressed to promote academic science as a viable subject choice at Maud Williams?

Your support shall translate into the assistance of accessing preliminary data in regards to the number of students currently enrolled in each academic program for this year and previous years if possible. I will also appreciate any information that can be provided as it pertains to the history of the school and its academic programs. I must present these preliminary data as a part of my research proposal. Upon approval, I will contact you once more for the formal commencement of data collection, which will involve the participation of your staff and students (through the use of surveys).
It is my hope that this project will provide your school with much needed analysis and recommendations to improve its academic science program and assist in the fulfillment of the school’s vision, mission, and goals. The project will also be approved by a Research Ethics Committee at USP and will secure the anonymity and wellbeing of all participants.

Should you require any further information please do not hesitate to contact me via email at S1105726@student.usp.ac.fj. Thank you for your attention and the anticipated feedback.

Yours sincerely,

Ms. Tamica Codd (PGDEd)
International Student, University of the South Pacific
Faculty of Arts, Law and Education (FALE)
Cell: 679 – 931- 0489
Email: S1105726@student.usp.ac.fj

Please find attached below a consent form that will indicate your interest in participating and your approval of the disclosure of the requested information.

I ____________________ principal of Maud Williams High School hereby grant access (name) to the data requested for the purpose this research proposal. I acknowledge that the information shall remain anonymous and shall be used for the sole purpose of the intended research.

__________________________  _________________________
Signature                                      Date
APPENDIX E

An Investigation of the Factors that Influence the Selection of Science as an Academic Program: A case study at Maud Williams High School, Belize

LETTER OF INFORMATION TO PARENT/GUARDIAN &

CONSENT FORM

Dear Parent/Guardian:

Your child has been selected to participate in a research survey conducted by a Masters student of the University of the South Pacific. This project is entitled: An Investigation of the Factors that Influence the Selection of Science as an Academic Program: A case study at Maud Williams High School, Belize. I write to seek your assistance in conducting this research by allowing your child to participate in responding to a questionnaire.

Researcher:

My name is Ms. Tamica Shayanne Codd and I am a Belizean student at the University of the South Pacific. I am in the process of completing my Master’s Degree in Education (MEd). This project is being supervised by Dr. Mesake Rawaikele Dakuidreketi of the Faculty of Arts Law and Education (FALE).

About the research:

The purpose of this study is to investigate the factors that influence selection of academic science as a course of study at Maud Williams High School and also make recommendations towards the improvement and accessibility of the science academic program at the school. It is also a partial requirement for my master’s degree at the University of the South Pacific.
Procedures:
This survey will take approximately 20 minutes. The questions will ask about your reasons for child selecting his/her academic program. Some of the questions that the researcher will ask include: Your child’s age, Academic program, his/her experience in primary school/high school; did your parents tell you which program to take?

Benefits of the research:

The findings of this research will provide a basis for future planning in the school and will also provide a framework for other research to be conducted in other subject areas as well as in other schools.

The data gathered will remain anonymous and confidential. Your child’s involvement is voluntary and he/she reserves the right to withdraw participation from the study at any time and withdraw any data gathered up to that point.

Should you require any further information please do not hesitate to contact:

__________________________

Tamica Codd
Belizean Researcher at USP
Phone: (679) 931-0489
Email: s11095726@student.usp.ac.fj
Consent:

(a) I have read and understood the purpose of this study. On this basis, I agree to allow my child to participate.

(b) I consent to publication of the results of the project on the understanding that my child’s anonymity is preserved.

(c) I understand that at any time, my child may withdraw from the project, as well as withdraw any information that has been provided.

(d) I note that this project has been reviewed and approved by the University Research Ethics Committee at the University of the South Pacific.

I am signing this Consent Form as parent/guardian on behalf of:

____________________________________________________
Age: __________ years

I hereby allow her/him to participate in this research project.

Name: (please print) ___________________________________________________

Signature: ___________________________________________________________

Date: ______________________