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Career Aspirations of Stem Students of University of Batangas Towards Stem Careers

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Abstract: One of the major changes in the education history of the Philippines is the implementation of the K to 12 Program which aims to provide sufficient time for mastery of concepts and skills, develop lifelong learners, and prepare graduates for tertiary education, middle-level skills development, employment, and entrepreneurship (gov.ph). In line with this program is the establishment of the STEM (Science, Technology, Engineering and Mathematics) strand equipped with a specially designed curriculum and programs to prepare the students in their desired line of course in the tertiary level of education. This study arises from the desire of the researchers to identify the career aspirations of the students towards STEM related careers and evaluate the current programs under STEM to determine its efficiency in influencing the students towards STEM careers. Using the survey research design, the researchers conducted a survey in 91 University of Batangas Lipa City (UBLC) Senior High school STEM students. Results show that the priority career of the students taking STEM strand is engineering but there are also students that will take unrelated STEM careers in the future. The results also suggest that the current STEM programs are influential to the students at an identified degree though there are some other suggested programs that may improve their skills and learning such as Internship. Based on the findings of this study, it is recommended for the UBLC to empower the current STEM programs and integrate career related activities to influence the students enough under STEM strand to take STEM related careers in the future.

Key Words: Career, Programs, Education

1. BACKGROUND

1.1 Introduction

One of the major changes in the education history of the Philippines is the implementation of the K to 12 Program which aims to provide sufficient time for mastery of concepts and skills, develop lifelong learners, and prepare graduates for tertiary education, middle-level skills development, employment, and entrepreneurship (gov.ph).

This program introduces the Science Technology Engineering and Mathematics strand to strengthen

the system education in the Philippines to be able to compete globally. Along with this implementation is the arousal of more problems such as instruction delivery, lack of qualified teachers, and lack of preparedness from the government.

K to 12 senior high school curriculum was created to give the best possible tools and career choices after high school and will lead students to employment, entrepreneurship, higher education and middle-level skills development (DepEd SHS Primer)

In line with this mission is the establishing of the Science, Technology, Engineering and



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Mathematics (STEM) strand. This strand is especially designed for the students who will take Engineering courses, Technology related courses like Information Technology, Science courses like Medicine, and Mathematical courses like BS Mathematics.

1.2 Related Literature

There are a lot of factors which affects the interests of the students in choosing their future career. According to the study entitled Predicting High School Students' Interest in Majoring in a STEM Field: Insight into High School Students' Postsecondary Plans, high school course taking in science and performance on science and math standardized tests was significantly and positively related to an increased interest in STEM. College aspirations were significant, and those with loftier educational goals were generally more likely to plan to major in a STEM field. Other individual-level factors also played a significant role, as male high school students were significantly more likely to have an early interest in STEM relative to their female peers, as were African American high school students compared with White students. Low-income students were significantly more likely to be interested in STEM majors than higher income students, respectively. In terms of school-level context, while teacher academic qualifications had a negative but significant relationship with an early interest in STEM, teacher experience had a small but significant positive relationship. (Lichtenberger, E. & Jackson, C, 2013)

According to the K-12 Education written in an article they are focusing on developing lessons and techniques that bring together STEM disciplines and concepts through creative hands-on projects and experiments. We provide programs which train teachers in how to bring these techniques to the classroom as well as programs for K12 students directly. Engineering, which is the application of science and technology, is a powerful lens for young people through which to view—and truly appreciate—the rules of the natural world (NYU Tandon School of Engineering).

Along with the implementation of the K to 12 Program is the arousal of many problems. According to UNESCO, integrated and interdisciplinary approaches to STEM disciplines can be problematic

because the teachers are insufficiently prepared and there are strong traditional disciplinary boundaries and low status of integrated learning areas compared to single subjects. Another problem is innovation increasingly requires collaborative and interdisciplinary knowledge which requires more facilities and equipment, and a powerful curriculum. (Massimo Amadio)

But despite of these problems are ways of improving the system of STEM strand such as, training for the teachers to develop their skills to effectively deliver an efficient instruction to the student and providing a training centre for specialized design seminars for the teachers. There also many programs that has been implemented in the STEM Program to influence the career interest of the students.

1.3 Statement of the Problem

This study will examine the career aspirations of those students under STEM track if they will take STEM related careers. Specifically, this will attempt to answer these questions:

- 1) What career choices are most likely to be taken by STEM students from University of Batangas?
- 2) What STEM programs influenced the student in choosing their career?
- 3) What proposed action maybe suggested for the STEM student?
- 4) To what extent were they influenced by STEM programs?

2. METHODOLOGY

2.1 Research Design

The researcher's wants to examine the STEM students who will be taking a STEM career in the near future. They aim to identify the different STEM programs that are being implemented and evaluate how effective is it in influencing their career choice. Due to the nature of the study, the researchers decided to employ a Descriptive design using survey questionnaires.

2.2 Respondents of the study

There are 91 respondents of the study from the Senior High school Department of University of



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Batangas who are taking under the STEM strand. They had experienced the specialized STEM programs and learned through a specialized curriculum and instruction. They had performed a different designed activity that has been influential to them under the STEM strand. They also already take career orientations and seminars to decide on what career they would take after Senior High school and College.

2.3 Instrument of the study

The study used a questionnaire as the primary research instrument to satisfy the desire of the researchers to gather information that will support their study. The researchers prepared four (4) sets of questionnaires in the survey. The first part aims to determine what the career choice of the students is. Then the next part aims to determine the STEM programs that might have influence the respondents' career choice. The third part aims to identify which is the most influential STEM program that affects the career choice of the students of the University of Batangas Lipa campus. The last part of the questionnaire aims to determine the possible solutions that may improve the STEM program to become more influential to students to choose STEM careers.

2.4 Data gathering and analysis

The researchers used a survey questionnaire parted into different sections. The first section is to identify the respondent's career choice. The second section allows the respondents to identify the programs that have influenced their choice. In the third section they identified to what extent they were influenced. Lastly, in the last section they had ranked the proposed programs given by the researchers for the improvement of managing STEM.

3. RESULTS AND DISCUSSION

TABLE 1
 CAREER CHOICES

CAREER	FREQUENCY	%	RANK
ENGINEER	57	63%	1
MEDICINE	9	10%	2
ARCHITECTURE	6	7%	3
AERONOTICS	4	3%	4
INFORMATION TECHNOLOGY	3	3%	5
MILITARY	2	2%	6.5
HRM	2	2%	6.5
TOURISM	1	1%	11.5
EDUCATIONAL	1	1%	11.5
PSYCHOLOGY	1	1%	11.5
SEAMAN	1	1%	11.5
ACTOR	1	1%	11.5
BIOLOGY	1	1%	11.5
RADIOLOGY	1	1%	11.5
VETERENARIAN	1	1%	11.5

This table shows the rank of the priority career choice of the students under the STEM strand. As shown in the results, engineering was ranked first which means that most of the respondents will take an engineering course in college and will take an engineering career. Second in the list is Medicine, followed by Architecture, Information technology, Aeronautics, Accountancy, Tourism, Military, Business Management, Education, Psychology, Law, HRM, Seaman, Culinary, Veterinarian, Actor, Biology, Programmer, Interior design, Fine arts, Radiology, Cruise line, Mass communication, BS Mathematics, Agriculture, Music composer, sports and at the bottom of the list is Theology.

As shown in the results, engineering is the number one choice of most of the students since it is one of the specialized subjects under STEM. But still there are unrelated careers towards STEM that the respondents have answered above. The last in the list is the Theology which belongs to HUMMS; it should be the main reason that is why it is last in the list.



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TABLE 2
 FACTORS THAT INFLUENCED THE CAREER CHOICE

STEM PROGRAM	FREQUENCY	%	RANK
CURRICULUM	26	18%	1
SEMINAR	19	13%	2
EXTRACURRICULAR	16	11%	2.5
ENROLLMENT	15	11%	2.5
FACILITY	12	8%	5.5
SCHOOL HOURS	12	8%	5.5
SECTIONING	10	7%	7
EDUCATIONAL TOUR	8	6%	8
FACULTY	8	6%	8

In the Table 2, the results of the frequency of the factors that influenced the career choice are shown. It shows that the Curriculum have the biggest percentage among the factors present above, followed by Seminar, Extra Curricular Activities, Enrolment, Facility, , School hours, Sectioning, Educational tour, Instruction, and last in the list is the Faculty.

The first in the list which mostly influence the students is the Curriculum. This shows that the respondents take the Curriculum seriously and carefully decided of which school which he or she will be admitted for it will be a big factor in developing ones skills towards their careers. While the last in the list is the Faculty, this shows that the students are having found the faculty is less influential in choosing their careers.

TABLE 3
 DEGREE OF INFLUENCE

STEM PROGRAM	FREQUENCY	%	RANK
OJT	28	30.8%	1
OFFICE	13	14.3%	2
SCHOOL HOURS	12	13.2%	3
SEMINAR	11	12.1%	4
EDUCATIONAL TOUR	10	11.0%	5

STEM PROGRAM	FREQUENCY	%	RANK
ANNUAL	5	5.4%	6
SPECIALIZED	4	4.4%	7
FACULTY			
COUNSELING	3	3.3%	8.5
EXCHANGE	3	3.3%	8.5
PROGRAM			

In Table 3, the results of the recommended results by the respondents are shown. Based on the results written above, the top priority solution is the implementation of the On the Job Training. It is then followed by the establishment of different clubs and organization, conducting seminars, educational tours, establishment of STEM office, specialized faculty, permitting of exchange programs, and counselling, annual evaluation of programs and lastly implementation of longer school hours.

TABLE 4
 PROPOSED PROGRAM FOR STEM CAREERS

STEM PROGRAM	W. MEAN	SD	RANK
ENROLLMENT	2.67	0.8	10
INSTRUCTION	2.82	0.7	7
FACULTY	2.78	0.7	9
EDUCATIONAL TOUR	2.89	0.8	5.5
FACILITY	3.07	0.9	2.5
COUNSELING	2.82	0.8	8
EXTRACURRICULAR	3.04	0.7	1
CURRICULUM	3.09	0.8	2.5

In Table 4, it shows the results of the evaluation of the degree of influence of the different STEM programs. Based on the table above, all the programs are less influential to the respondents. This means that the programs that were implemented by the school didn't take much part in the aspiration of the STEM students to take STEM careers. It is insufficient and less effective.

4. CONCLUSIONS

Based on the gathered data in this research, the top priority career of the students under STEM strand is engineering but still there are students that will take unrelated STEM careers in the future. The results also show that all the current STEM programs are influential but ranked in a certain



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extent wherein the students were influenced. It also show that the most suggested STEM programs to be implement is the Internship of On-the-job training.

NYU Tandon School of Engineering.
<http://engineering.nyu.edu/k12stem>

Hence, it is recommended to empower the programs by conducting seminars, establishment of different STEM related organization and by strictly implementing of the program in the activities and instruction.

5. ACKNOWLEDGMENTS

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6. REFERENCES

- Amadio, M. Stem education and the curriculum: Issues, tensions and challenges.
<http://www.akademisains.gov.my/download/STEM%20education%20and%20curriculum.pdf>
- Beggs, J.M, J.H. Bantham, and S. Taylor. 2008. Distinguishing the factors influencing college students' choice of major. *College Student Jour.* 42(2): 381.
- Edwards, K & Quinter, M.(2011). Factors influencing students career choices among secondary school students in Kisumu Municipality, Kenya .
- Fizer, D.(2013, December). Factors Affecting Career Choices of College Students Enrolled in Agriculture
- Ghuangpeng, S.(2011). Factors influencing career decision-making: A comparative study of Thai and Australian tourism and hospitality students
- Harzer, C., & Ruch, W. (2012). The application of signature character strengths and positive experiences at work. *Journal of Happiness Studies.*
- Lichtenberger, E. & Jackson, C.(2013). Predicting High School Students' Interest in Majoring in a STEM Field: Insight into High School Students' Postsecondary Plans.
- Mcglynn, A.P. 2007. Achieving the Dream – What is it, and What's new? *The Hispanic Outlook in Higher Education* 18(4):44-45
- Mind Tools,(2014). Investigating for career opportunities.