Factors Affecting the Selection of Upper Secondary Education in Sciences Program of Grade 9 Students in Muang District, Nakhonsawan Province

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Abstract

Mathematics and Sciences are the foundation of human daily life and the foundation of education in various subjects including the basic science of national development. Although these sciences are important but the number of students who are interested in Sciences is decreasing. Therefore, researchers are interested in studying factors of choosing to study at upper secondary education in Sciences program of grade 9 students in Muang district, Nakhonsawan province. A dataset was selected by sampling technique and their data were collected by questionnaire.

The study states that the number of vocational students has increased while the number of general students has been decreasing. The number of students who chose to study at upper secondary education in Sciences program also has reduced. In addition, the result reveals that demographic information plays an important role in students' decision. There are also other four statistically significant factors related to the students' decision.

Keywords : upper secondary education, Sciences program, sampling technique, questionnaire, correlation

Introduction

Education is the process of learning by being transmitted from person or media to person. Its objectives are to gain knowledge and to understand on various matters which can be utilized and developed for humans to grow both in the brain and intellect along with morality and ethics. They can also live happily with others in the society. Currently, the education system in Thailand has a more diverse knowledge transfer process. It also has created and brought various modern tools for transferring knowledge to learners and helping them to understand easily. In addition, the Thai government has enacted compulsory education laws. According to the National Education Act 2542 B.E., people are provided with free basic education. The basic education is divided into three levels which are early childhood education, primary education (or elementary education), and secondary education. The secondary education can be divided into two periods which are (a) lower secondary education that provides the students to find their own aptitude of study both academic and profession (b) upper secondary education or high school that encourages learners to

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รับต้นฉบับ 29 กุมภาพันธ์ 2563 ปรับแก้ไขตามข้อเสนอแนะของผู้ทรงคุณวุฒิ 2 สิงหาคม 2563 รับลงตีพิมพ์ 31 สิงหาคม 2563

study according to their aptitudes and interests as a basis for further study or occupations (Pawaboot, S., 2015).

The upper secondary education is divided into two types which are general education and vocational education. The general education is the basic education management which is specified by the Ministry of Education and focuses on teaching and learning of eight content areas. These are the learning of (1) Thai language, (2) Mathematics, (3) Sciences, (4) social studies, religion and culture, (5) health and physical education,(6) arts, (7) occupations and technology, and (8) foreign languages. Moreover, the general education can be divided into two programs that are Sciences and Arts programs. One focuses on the subjects in Mathematics and Sciences in various fields including Chemistry, Biology, and Physics. Another focuses on subjects in Thai, foreign languages, literature, arts and social studies. The vocational education emphasises on specialised career or job preparation. It is divided into two levels which are vocational certificate and high vocational certificate (Pawaboot, S., 2015).

Sciences has played an important role from the past to the present and continue for the future as well. Sciences learning is a learning for understanding. Students are able to link various areas of knowledge into holistic knowledge. This will lead to a creation of various things. Knowledge and research are Sciences that helps develop the most effective technology for humans (Sanchez, G., 2018). Especially in this day and age, Sciences plays an important role in every human being life. Sciences involves in lifestyle, occupation, tools, appliances and products. Without a doubt, everything is full of convenience in both work and lifestyle resulting from Sciences.

According to the annual report of the office of the Education Council in 2018 (Office of the Education Council, 2019), the statistics stated proportions of students who enrolled in upper secondary education between general education and vocational education from academic year 2007 to 2017 as shown in Table 1. It shows that the number of students enrolled in general education tends to decrease since the academic year 2014 onwards. At the same time the number of students enrolled in vocational education has increased. In a similar way, the strategy and information division for provincial development Nakhonsawan office also reported in 2018 that the number of students studied in the general schools have decreased while the number in the vocational schools has increased.

Table 1 the percentage of students enrolled in general education and vocational education during 2007 to 2017

Academic Year	General Education (%)	Vocational Education (%)
2007	60.2	39.8
2008	61.2	38.8
2009	62.3	37.7
2010	63.4	36.6
2011	64.6	35.4

2012	65.8	34.2
2013	67.3	32.7
2014	**67.7**	**32.3**
2015	**67.3**	**32.7**
2016	**66.1**	**33.9**
2017	**65.4**	**34.6**

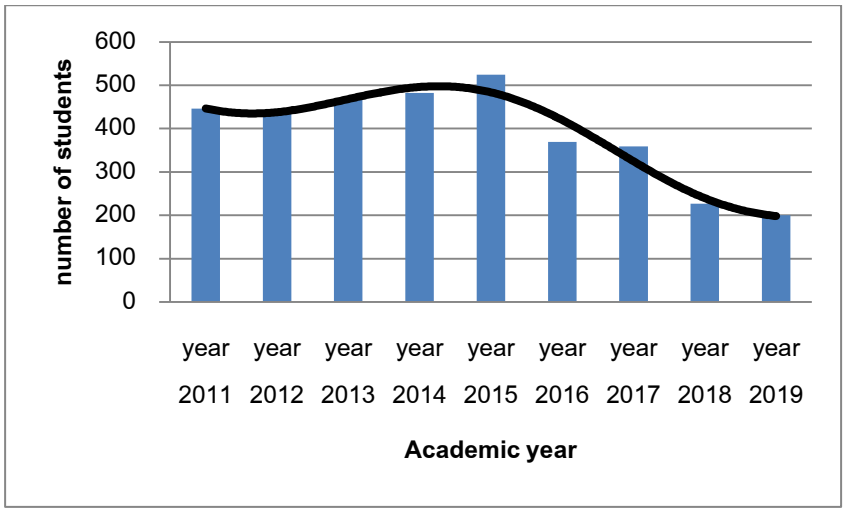

Figure 1 a trend and the number of students of faculty of Science and Technology, Nakhon Sawan Rajabhat University during 2011 – 2019

Figure 1 shows the number of students in faculty of Science and Technology, Nakhon Sawan Rajabhat University (NSRU) during 2011 to 2019 (Office of academic promotion and registration, 2019). It can be seen that a trend of the number of students during the past five years is steadily decreasing. To study in this faculty, students have to graduate their high schools from general education especially Sciences program. However, it can be observed that the trend of students interested in studying in the general education has started to decrease, so it may affect the number of students of this faculty.

From the above information, it was found that Sciences is important to human well-being including national development in various fields. However, the number of students who studied in general education and faculty of Sciences have decreased. Therefore, this research aims to survey types and programs that students are interested in, to study trend of choosing to study the upper secondary education in Sciences program, and to study factors affecting further education of grade 9 students in Muang district, Nakhonsawan province.

Methodology

1. Dataset

The population in this study was all the last year students (grade 9) who were studying in academic year 2019 of lower secondary schools in Muang district, Nakhonsawan province. A total of 3,062 students from both public and private schools were selected by using purposive sampling technique (Niyamangkoon, S., 1998). In addition, school's size might affect

the decision of these students hence they were classified into four groups based on their schools' size, small, medium, large and extra-large schools. The dataset consisted 219 students from small schools, 146 students from medium schools, 494 students from large schools and 2,203 students from extra-large schools.

2. Data Collection

Before data collection of 3,062 students, a questionnaire was applied for the data collection and composed of three parts (Phothianai, W. & Suwanat, J., 2010). Firstly, personal or demographic information including gender, GPA, and their parents' background are collected. Secondly, multiple-choice questions for choosing types and programs are questioned. Lastly, the questionnaire ends up with questions about decision factors affecting studying in high school of grade 9 students. This part is rating scale and is divided into four groups including personal reason, influence from other people, school education guidance, and study expenses.

After an initial questionnaire was designed, it was firstly assessed by three specialists. The IOC value of the proposed questionnaire was 0.85 which was between 0.6 and 1 (Roongruang, S., 2019). This means it was appropriate for collecting the dataset. However, it was slightly revised to be more complete as recommended by the specialists. Then, the modified questionnaire was tried out for collecting 30 samples and its reliability value was calculated using Cronbach's alpha in equation 1. Let K be a number of questions, s_i^2 be a variance of question i, and s_t^2 be a variance of the whole question. The value of Cronbach's alpha coefficient can be calculated from

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} s_i^2}{s_t^2}\right] \qquad (1).$$

An alpha coefficient of the proposed questionnaire was 0.741 which was greater than 0.7 (Phisalabut, S., Yaiswang, S., & Assawadechanukon, P., 2010). as shown in Table 2. This means the questionnaire was reliable and suitable for the actual data collection process.

Table 2 the value of Cronbach's Alpha.

Reliability Statistics	
Cronbach's Alpha	**Number of questions**
0.741	16

3. Data Analysis

After collecting the data, they were initially analysed using descriptive statistics and were assessed the students' opinion level using Likert's technique. These information are both qualitative and quantitative data therefore a correlation of the dependent variable,

choosing to study in higher education in Sciences program, and independent variables, all factors affect the selection of upper secondary level in Sciences program of grade 9 students, was evaluated using Chi-square test from the equation (Kanchanasamranwong, P., 2017)

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \quad (2)$$

where $E_{ij} = \frac{r_i \times c_j}{n}$,

n is a total number of data,

r_i is a total number of data in row i,

c_j is a total number of data in column j.

Results

After collecting the dataset, SPSS was used to analysed its descriptive statistic. The results show in Table 4 and Table 5. Table 4 displays a number of students categorised by gender and school size. It was found that the majority of students was female, 1,561 students (51.0%), and the rest were male, 1,501 students (49.0%). Also, the most students (71.95%) were from the extra-large school. The remaining students were from large, small, and medium schools respectively.

Table 4 the frequency and percentage of respondents classified by gender and school' size.

Gender	School Size				Total
	Small	Medium	Large	Extra-Large	
Male	113 (7.53%)	93 (6.20%)	270 (17.99%)	1,025 (68.29%)	1,501 (49%)
Female	106 (6.79%)	53 (3.40%)	224 (14.35%)	1,178 (75.46%)	1,561 (51%)
Total	219 (7.15%)	146 (4.77%)	494 (16.13%)	2,203 (71.95%)	**3,062 (100%)**

Table 5 the selection of continuing education for the upper secondary education.

Interested in studying	General Education		Vocational Education	Total
	Sciences	Arts		
Yes	1217 (39.75%)	713 (23.29%)	1107 (36.15%)	3037 (99.2%)
No		25 (0.8%)		25 (0.8%)

Table 5 states that most students, 3,037 students (99.2%), were interested in continuing to study the upper secondary education. On the other hand, there were only 25 students (0.8%)

were not interested in further education. Also, it can be seen that almost two third of these students, 1,930 students (63.55%), were interested in general education while 1,107 students (36.45%) were interested in vocational education. Moreover, 1,217 students (63.06%) were interested in Sciences program while 713 students (36.94%) were interested in Arts program.

Table 6 mean, standard deviation and interpretation of opinions level of each question.

Factors affecting the study selection	Mean	S.D.	Interpretation
Personal Reason			
1. Student wants to have more educational qualifications for further study. (Q311)	4.40	0.737	Strongly Agree
2. Student wants to have knowledge and have educational qualifications for using in their career. (Q312)	4.51	0.660	Strongly Agree
3. Student has faith in educational institutions to continue studying. (Q313)	4.13	0.791	Agree
4. The family encourages further education. (Q314)	4.55	0.737	Strongly Agree

Table 6 (continue) mean, standard deviation and interpretation of opinions level of each question.

Factors affecting the study selection	Mean	S.D.	Interpretation
Influence from other people			
5. parents participate in deciding to study further (Q321).	3.82	0.982	Agree
6. The advice of relatives helps in deciding to study further. (Q322)	3.37	1.096	Undecided
7. The seniors give advice on choosing to study further. (Q323)	3.05	1.162	Undecided
8. Friends persuaded choosing what to study. (Q324)	3.18	1.132	Undecided
Guidance in educational institutions			
9. Teacher suggestions. (Q331)	3.69	0.980	Agree
10. Master's advice of school counselors. (Q332)	3.70	0.960	Agree
11. Public relations information for school guidance. (Q333)	3.53	0.955	Agree
12. Expenses related to tuition fees. (Q341)	3.61	0.893	Agree
13. Living expenses such as food, accommodation, and bus costs. (Q342)	3.60	0.917	Agree
14. Expenses related to books School Supplies. (Q343)	3.64	0.929	Agree

Table 6 presents the average and standard deviation of students' opinion level of each question by using Likert's technique. The opinion level was divided into five levels which are strongly agree, agree, undecided, disagree and strongly disagree respectively. It was found that the most personal reasons are in the strongly agree level except question Q313 that is in agree level. For second group, there is only question Q321 that is in agree level while the rest questions are in undecided level. For the remaining groups, all questions are in agree level.

Table 7 results of Chi-Square tests between choosing to study in Sciences program and student personal information.

Personal Information	Chi-Square	df	Sig
Gender	218.097	2	0.000
GPA	1219.224	586	0.000
Parents' status	57.877	14	0.000
Father's occupation	193.161	15	0.000
Mother's occupation	197.140	19	0.000
Family's income	325.994	10	0.000
Father's education	369.292	14	0.000
Mother's education	313.387	14	0.000

The result of Chi-square test as shown in Table 7 states that there are relationships between choosing to study in Sciences program and all student personal information at statistical significance level 0.05. In addition, the correlation test between choosing to study in Sciences program and all factors affecting high school of grade 9 students are shown in Table 8. It can be seen in Table 8 that nine factors are related to choosing to study in Sciences program at statistical significance level 0.05. These are all factors of student personal reasons and all factors of expenses for study reasons. Moreover, there is only one reason of influence from other people that is question Q321. The last reason is only one reason of guidance in educational institutions that is question Q332.

Table 8 results of Chi-Square tests between choosing to study in Sciences program and factors affecting high school of grade 9 students (opinion questions).

Personal Reason	**Chi-Square**	**df**	**Sig**
Q311	228.893	10	0.000
Q312	76.440	8	0.000
Q313	102.513	8	0.000
Q314	248.835	8	0.000
Influence from Other	**Chi-Square**	**df**	**Sig**
People	47.204	8	0.000
Q321	11.339	8	0.103
Q322	4.936	8	0.764
Q323	13.555	8	0.094
Q324	**Chi-Square**	**df**	**Sig**
Guidance in Educational			
Institutions	14.404	8	0.072
Q331	30.619	8	0.000
Q332	14.921	8	0.061
Q333	**Chi-Square**	**df**	**Sig**
Expenses for Study	17.096	8	0.029
Q341	43.201	8	0.000
Q342	31.923	8	0.000
Q343			

Discussion and Conclusion

All grade 9 students of academic year 2019 in Muang district, Nakhonsawan province were collected for studying the factors affecting the selection of upper secondary education in Sciences program. The results state that most students (99.2%) would like to study the upper secondary education. There are, however, only 40% of them intend to study in Sciences program. Whereas one-thirds of them are interested in vocational education. These numbers show that the trend of Sciences students is decreasing and is not as popular as in the past because there are now various choices for higher education. In addition, it was found that gender, GPA, parent's background and school's size related to students' decisions which are not different from the past. The Chi-square test's results also reveal that there are nine factors influence on their choosing to study the upper secondary education. Most affected factors on the students' decision are from both their own reasons and expenses. For further work, this information will be used for creating an opportunity forecasting model for choosing to study in Sciences program.

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