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## Suggestion on Electrical Courses by Survey Data for Career Education in Thailand Community College

**Abstract.** The courses study is an important role in educational institutions, particularly, the career education, which produce the students into the labor market. This study objective is to suggest and analyze the influence of electrical courses in individual's choice for future working of career students. Respondents in the survey were students of Vocational Certificate (Voc. Cert.) students from Srisamrong Industrials and Community Education college in Thailand. The quantitatively data was collected by the questionnaire forms. As the subjects' studies, there are industrial materials, electrical drawing, direct current circuit, electrical measurement, electrical system installation, and electronic devices. The statistical package for the social sciences was used as a tool to analyze the survey data, especially, the statistically significant in various parametric values. There have been found that the analysis results have shown most of respondents like and give positive respond on the electrical courses. The results have also presented the percent of values by over 70% of like in all subjects with the P-value more 0.05. Moreover, there have been found the significant difference between male and female, which presented the dramatic different chosen of any subjects. Therefore, the subject choice makes an impact on any future careers and to be employer options, which will be able to deal effectively with change and developing to apply in the future of work.

**Streszczenie.** Kursy studyjne odgrywają ważną rolę w instytucjach edukacyjnych, zwłaszcza w kształceniu zawodowym, które wprowadzają studentów na rynek pracy. Celem tego badania jest zasugerowanie i przeanalizowanie wpływu kursów elektrycznych na wybór jednostki na przyszłą pracę studentów zawodowych. Respondentami w ankiecie byli studenci Vocational Certificate (Voc. Cert.) z uczelni Srisamrong Industrials and Community Education w Tajlandii. Dane ilościowe zostały zebrane za pomocą formularzy kwestionariuszowych. Przedmiotem studiów są materiały przemysłowe, rysunek elektryczny, obwód prądu stałego, pomiary elektryczne, instalacja instalacji elektrycznych, urządzenia elektroniczne. Pakiet statystyczny dla nauk społecznych został wykorzystany jako narzędzie do analizy danych ankietowych, w szczególności statystycznie istotnych w różnych wartościach parametrycznych. Stwierdzono, że wyniki analizy wykazały, że większość respondentów lubi i pozytywnie ocenia kursy elektryczne. Wyniki pokazały również odsetek wartości o ponad 70% podobnie jak u wszystkich badanych z wartością P większą niż 0,05. Ponadto stwierdzono istotną różnicę między mężczyznami i kobietami, która przedstawiała dramatyczną odmienność wybranych przedmiotów. Dlatego wybór przedmiotu ma wpływ na przyszłe kariery i opcje pracodawcy, który będzie w stanie skutecznie radzić sobie ze zmianami i rozwojem, aby zastosować go w przyszłej pracy. (Sugestie dotyczące kursów elektrycznych na podstawie danych ankietowych dotyczących edukacji zawodowej w Tajlandii Community College)

**Keywords:** Career Education, Electrical Courses, Future of Work, Community College.

**Słowa kluczowe:** Edukacja zawodowa, kursy elektryczne, przyszłość pracy, Community College.

### Introduction

In the education approaches, the system should be planned carefully for the important changes in the future, which is the key to success. Normally, in Thai education system is normally consisted of twelve years of basic education [1-2]. Beginning, Thai students are required to entire the compulsory nine years up to the end of the lower secondary level. After that, students who complete lower secondary education can be accepted to enter in the vocational education. In an era of changing skill needs in the labor market, the career education is an important part of vocational systems around the world [3]. Particularly, the career education in Thailand plays an essential important part. According to the trend of Thai education in present, the share of students applied in the Vocational Certificate (Voc. Cert.) is continuous growth by referring to the Office of the Vocational Education Commission (OVEC) [4-5]. As the career education in Thailand, the career institution is known as a place to hold a training program which have a responsibility to produce students in numerous fields, for example, industrial materials, electrical, machine tool, and civil [6-8]. Additionally, the career institution is considered as a part of potential institutions to solve society and economic, such as unemployment problem by developing of course under employer requirement. Specially in the electrical field, this field objective is to improve of career skills under a balanced curriculum with vocational knowledge and skills to enhance their opportunities for employment and studies in the future. In addition, the electrical engineering subject covers principally

fundamental knowledge and job required in the electrical engineering sectors, such as engineering assistants, electrical installation electrician, and office maintenance electrician [9-11]. Consequently, employment results of vocational graduates in Thailand are relatively substantial leading to the vocational students can get higher wages as well as higher employment rates [12]. However, the vocational education institutions in Thailand have still confronted some issues, such as misconception among course teaching of teacher and learning behaviors of students, which lead to the less employment problems in some fields. Therefore, the ensuring of student's skills by effective education system is necessary. To address these problems, the using effective tools of study method are considered honestly, such as survey method, data analysis, and statistics method, which can be used to evaluate the negative impact as mentioned above [13-15]. Previously, there are many teams of researchers have done in career studies of vocational education.

Previously, there are many groups of researchers have investigated on vocational education. Satimanon, T. [15] reported that the cause and consequences of labor mismatch in Thailand. As a result, the labor mismatch causing to the increasing of unemployment, which was a negative effect to students. Moenjok, T. et al. [16] studied the study of choice in vocational in Thailand by using a probit model. They found the significant factor of students who wanted to apply in vocational level is that family with the well. Moreover, Moreover, the reported suggests that the investment is. an essential more beneficial to improve

education system. Albert, A [17] studied on the vocational education in ASEAN countries (Indonesia). Yuriy Bobalo et al. [18], they developed the electronic textbook, which based on structure and the basic principles of the electronics and electrical text book. They also evaluated the knowledge of student in the field of electronic circuits, which was discussed. Adam, P., [19-20], They designed and created the educational platform using the results of Hardware-in-the-Loop real-time simulation of switch-mode converters in FPGA-based hardware as a detailed. For the result, it can be used for apply in any electrical courses. Marian Noga et al. [20], they improved and innovated the students learning in engineering fields in Polish technical universities. In different international standard, the learning of building automation systems was connected by LonWorks, KNX, BACnet. Some researcher group found that the improvement the quality of education was an important part of vocational education. The Indonesian Qualification institution framework (IQF) was improved by the form of construction. In another group, they found that the employers will focus on students who graduated from vocational institution than students who graduated from university [21-23]. Moreover, in other groups reported the gap between skills and knowledge of graduates on the difference needed of employers, which the educational system should be established in higher quality along with the attitude of students also needs to change [24]. Thus, there are many factors that can impact a student attitude through courses study. This factor can effect the level of learning and the career in further.

In this work, the survey data from Srisamrong Industrial and Community Education College of Thailand was analyzed through statistical package for the social sciences (SPSS) through vocational students. As the framework, the questionnaire was used by separated various topic, including gender, age, level education, and electrical courses (industrial materials, electrical drawing, direct current circuit, electrical measurement, electrical system installation, and electronic devices). As a result, the obtained analysis can be used applied for improvement the courses study, as well as student can be used for student consideration to apply in many companies in future of work.

## Methodology

The objective of this study is to suggest the result analyzed of electrical course of career students in Srisamrong Industrial and community education college of Thailand. The statistical package for the social sciences (SPSS) [25] was used to analysis the various parametric, which were investigated by valid, missing, total, frequency, percent, valid percent, valid percent, and cumulative percent in all information data [26]. In addition, to ensure the data output, the statistically significant (P value or Sig. 2-tailed) were examined in this study along with t-test, degrees of freedom (df), mean difference, and the lowest and highest. The data were collected in August 2022 in the survey from "Data Collection Survey on career education in vocational certificate of electrical courses".

Furthermore, the questionnaire forms were used as a research instrument [27-28]. The questionnaire consists of several questions, which was separated into two parts. Firstly, the information of gender, age, and education level was collected. The second part included of six multiple-choice items, which are industrial materials, electrical drawing, direct current circuit, electrical measurement, electrical system installation, and electronic devices. As the engagement, the Thai languages was used in all questionnaire form.

## Results and discussion

The statistical analysis performed in this section is based on the data collected from the questionnaire in Srisamrong Industrial and Community Education College of Thailand. In Table 1-3, the total number of career students were presented by the separation of gender (Male and Female), age, and education level, which focused on electrical field. Looking in the Table 1 in more detail, Male are more likely to apply in career education than Female, which was displayed by 79.0% compared to Female by 20.7%. Reasonably, the main factor has to do with cultural aspects, which seem to be truly immersed in the Thai education system with the career courses are skewed to the industrial fields, which result in not attractive for female students [29-32]. In addition, Table 4 to Table 9 presented the survey data constructed questionnaire by SPSS analysis technique, which displayed in different subjects of electrical courses, including industrial materials, electrical drawing, direct current circuit, electrical measurement, electrical system installation, and electronic devices. Note that the scope of answer was fixed by like, hesitant, and dislike.

Table 1. The investigation results based on gender of career students by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
Male	23	79.3	79.3	79.3
Female	6	20.7	20.7	100.0
Total	29	100.0	100.0	

Table 2. Investigation results based on age of career students by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
Under 15 year	1	3.4	3.4	3.4
16-18 year	28	96.6	96.6	100.0
Total	29	100.0	100.0	

Table 3. Investigation results based on education level of career students by SPSS

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
Vocational Certificate	29	100.0	100.0	100.0

Table 4. Results evaluation in industrial materials by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
dislike	1	3.4	3.4	3.4
hesitant	6	20.7	20.7	24.1
like	22	75.9	75.9	100.0
Total	29	100.0	100.0	

Table 5. Results evaluation in electrical drawing by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
hesitant	4	13.8	13.8	13.8
like	25	86.2	86.2	100.0
Total	29	100.0	100.0	

Table 6. Results evaluation in direct current circuit by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
hesitant	3	10.3	10.3	10.3
like	26	89.7	89.7	100.0
Total	29	100.0	100.0	

Table 7. Results evaluation in electrical measurement by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
dislike	1	3.4	3.4	3.4
hesitant	5	17.2	17.2	20.7
like	23	79.3	79.3	100.0
Total	29	100.0	100.0	

Table 8. Results evaluation in electrical system installation by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
dislike	1	3.4	3.4	3.4
like	28	96.6	96.6	100.0
Total	29	100.0	100.0	

Table 9. Results evaluation in electrical devices by SPSS analysis

Valid (n=29)	Frequency	Percent	Valid Percent	Cumulative Percent
dislike	1	3.4	3.4	3.4
hesitant	8	27.6	27.6	21.0
like	20	69.0	69.0	100.0
Total	29	100.0	100.0	

Furthermore, the participants interested in electrical system installation programme have the largest number, which is presented by the percent of 96.6 % from 29 candidate in Table 8. This is much higher than the average across other electrical subjects, where these shares reach direct current circuit subject (89.7 %), electrical drawing subject (86.2%), electrical measurement (79.3%), industrial materials (95.9 %), and electronic devices (69.0 %), respectively. Meanly, the different result of analysis values is the reason of a lack of interest in the vocational level education of students. This result is related with the topics of career guidance and career expectations in the future of desired students. Therefore, the important of career education of interested subjects is the foundational as key to enter the future of education and work, as can be seen in Fig. 1.

In the same hand, the statistically significant (P value or Sig. 2-tailed) was calculated to enhance the information of number from a statistical test in different parametric statics in the survey data of electrical courses in Srisamrong Industrial and Community Education College. The objective is to confirm that the data is the normal distribution to use the parametric tests in data analysis.

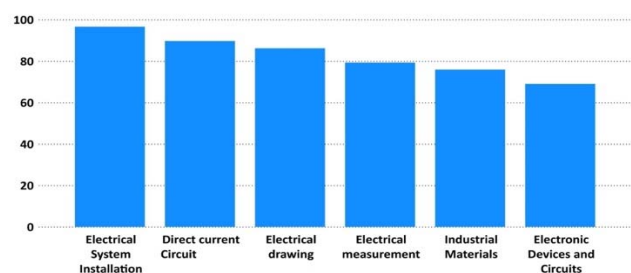


Fig. 1. The summary of different subjects chosen of student in different electrical subjects

Question: Is the average age of the population equal to 17?

$$H_0 : \mu = 17$$

$$H_1 : \mu \neq 17$$

The statistics significant ( $\alpha$ ) was determined by .05

As can be seen in Table 10, the t-value was calculated to examine the hypothesis, which was included by various parametric under the population mean of 17. The values were shown by t-test (-0.593), degrees of freedom (df) (28), P-value (0.558), mean difference (-0.103), the lowest and highest under the 95% confidence interval of the difference (-0.46 and 0.25, respectively). According to the obtained result of  $t = -0.593$  and  $P\text{-value} = 0.558$ , the values presented more than 0.05, meanly, the hypothesis was significantly accepted.

Table 10. The Statistical parametric based on age

Valid (n=29)	T-test	Degrees of Freedom (df)	P-value (Sig. (2-tailed))	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
age	-0.593	28	0.558	-0.103	-0.46	0.25

Moreover, the statistical testing of different mean values in electrical subjects chosen was determined by hypothesis as following,

Question: Is there any significant difference between electrical courses based on survey data in Srisamrong Industrial and community Education college?

$H_0: \mu_1 = \mu_2$  (There is no significant differences between electrical course chosen)

$H_1: \mu_1 > \mu_2$  (There is significant differences between electrical course chosen)

In Table 11 presented the output of appropriate descriptive statistics for every subject of electrical courses. Looking at the Table 4 in more detail, the analysis testing showed that there is a significant different between six group means. As a result, mean rank value of P-value in electrical system installation was experienced by 0.326 more than the other group, which presented by direct current circuit (0.083), electrical drawing (0.043), electrical measurement (0.17), industrial materials (0.009), and electronic devices and circuits (0.002), respectively. According to the definition of  $\alpha$ , all the P-value obtained results presented more than 0.05 hypothesis definition, thus, the hypothesis was accepted under the significant different values in this study.

Table 11. The Statistical parametric based on difference subjects

Valid (n=29)	T-test	Degrees of Freedom (df)	P-value (Sig. (2-tailed))	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Industrial Materials	-2.816	28	0.009	-0.276	-0.48	-0.08
Electrical drawing	-2.117	28	0.043	-0.138	-0.27	0.00
Direct current Circuit	-1.797	28	0.083	-0.103	-0.22	0.01
Electrical measurement	-2.544	28	0.017	-0.241	-0.44	-0.05
Electrical System Installation	-2.544	28	0.326	-0.034	-0.11	0.04
Electronic Devices and Circuit	-3.360	28	0.002	-0.345	-0.56	-0.13

The data analyzed showed that all career students participated a positive attitude toward electrical courses, which presented the average value over 70 % in all field. For this, it is evidence that the questionnaire result showed the optimum tendencies with the effects of values in this

study, which was shown by Fig. 1. Clearly, there is an interest in various subjects in the electrical field. By comparison, the gender and age have a significant effect to the student of field study because of the different sensitive about learning skill. According to the result from questionnaires, there are less contrasting in electrical courses. Especially, the electrical system installation displayed the highest by statistically significant. Moreover, the differentiations of response were significantly found by the condition of hesitant and dislike. Looking at the information in Table 5, there have been found that the data of hesitant presented the highest selected, which was shown by around 13.8%, similarly, other subjects presented in respectively. In addition, the answers of hesitant was display by the subject of industrial materials, electrical drawing, electrical measurement, electrical system installation, and electronic devices, respectively. In these cases, researchers can conclude that the career students believe in their thinks and having their target of future along with their desired work in the future. Consequently, following to the part of analysis, the result obtained can be described of career student tendencies in the future of work.

For the future of work, the quality of education is an important, especially, career educations because it is a significant role for education system, which can be promoted of sustainability in countries. The career institutions can contribute to this in many ways, such as restructure curriculum to suit students and using a questionnaire. Note that students gain task specific fields that influence their career choice. Therefore, in the institutional level should focused on the curriculum for a particular course or career, which is about important competencies for selected career field. However, it is important that career students should have a good understanding of a professional in the selection field and should be able to see the relation between what they learn and what they will do in the future of their work

## Conclusion

This research reported the suggestion on electrical courses by survey data for career education in Srisamrong Industrials and Community Education College of Thailand. In conclusion, as career students chosen about the different of several electrical courses available and make tentative decisions about which course subject they will apply, that obtained result is significantly important that they can plan and take a desired work of study in career education college that will prepare them for the future of work. Consequently, the preparing career students for their roles in any companies of work has become significant for career education, which is lead to the future of work, career students will have the opportunity to development of career to meet the challenges of the changing workplace.

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