STUDENT SERVICES BY GOOGLE DRIVE, ACADEMIC SERVICE SECTION, FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

The purpose of this research is 1) To set a system and procedure for student services with Google Drive. 2) To inquire opinion about the services provided to students with Google Drive of Academic Service Section, Faculty of Science and Technology. The researchers have developed a system and procedures for student services with Google Drive, provide a questionnaire for the service. The samples were students from the Faculty of Science and Technology who applied for educational services and receive support services at the One Stop Service. There were 14 programs and 350 samples. The statistics used in the data analysis were descriptive statistics: percentage, mean and standard deviation. The research found that the opinions on the service of the students in all three aspects as a whole. Consider each aspect, the service formats through Google Drive are at a good level, the process and service process are at a good level, and the efficiency and quality of services are at a good level.

Keyword: student services, descriptive statistics, Google Drive

1. INTRODUCTION

The Strategy of Thai government development (2013-2018) is a new public management. Strategic issue 1 that is the service excellence formation for service people by encouraging government agencies to upgrade their service systems is to improve and develop service quality seriously. The government agencies, state enterprises, or private organizations are aware of changing processes or procedures to improve work efficiently and effectiveness. The government ministry, department and division have a restructuring organization to reduce work duplication [1].

The aims of Faculty of Science and Technology, Suan Sunandha Rajabhat University are studying, teaching and supporting to student service. Student service system has been operated by using one-stop service. The development of student service system is composed of operators, materials, equipment and accessible technology for students in order to improve service efficiency. The problems of academic service section are the many aspects of service requests. The service request management is complex. The service management is request record into the one-stop service system, student request classification, service operation, follow-up request, and informs success of request to students. Moreover, some operators at one-stop service have less academic experiences to service students.

The researchers have realized the problems of one-stop service management at Faculty of Science and Technology, Suan Sunandha Rajabhat University. The researchers are interested to develop academic service by using information technology in order to increase service efficiency. In addition, the improvement of academic service is also increase efficiency of process and operator at one-stop service. We have initiated the use of google drive for academic service at Faculty of Science and Technology, Suan Sunandha Rajabhat University.

2. OBJECTIVES

1) To set a system and procedure for student services with Google Drive of Academic Service Section, Faculty of Science and Technology.

2) To inquire opinion about the services provided to students with Google Drive of Academic Service Section, Faculty of Science and Technology.

3. METHODS

A. Planning, Team Appointment and Duty Assignment

Operation planning by brainstorming on patterns and procedures for preparing for pre-operation through staff and executive meetings. Executives issued the policy to set up google drive for student support at one-stop service. The researchers planned to create application services with google drive. The researchers had appointed of working operators, assigned duties. The IT experienced member, Mr.Suphakit has trained "google drive application" to all working operators. The process of system set up was followed Organization and Management Theory [2].

B. Population and Sampling size

The population used in the research was all students of the Faculty of Science and Technology, Suan Sunandha Rajabhat University that uses educational services. There are 14 programs of 2600 people.

The Sampling size was a student of Faculty of Science and Technology using calculating method of Taro Yamane 1970 [3] as 350 samples.

C. Research Tools

Research Tools is questionnaire on the opinion of services. Student Inquiries by using the questionnaire open-end and close end questions.

D. Data Analysis

The questionnaire was distributed to the students of the Faculty of Science and Technology in sampling size. The questionnaire was distributed by randomly and sent to students as 350 samples. The questionnaires were analyzed statistically by using a computer statistical software program to calculate the statistics. Descriptive statistics was used to explain personal factors of the recipients of the Faculty of Science and Technology follow as Thovicha and Pinyo [4]. The results were analyzed, compared with the interpretation criterion of mean and standard deviation.

E. Opinion level standard

Opinion level standard can be divided score by a range. Each range is 5 levels. Criteria used to interpret information according to Likert Scale method follow as Likert, Rensis1967 [5]. Each scale is divided into 5 levels. The score range is meaning as follows.

Score range of 4.21 - 5.00, meaning of the level of opinion is very good.
Score range of 3.41 - 4.20, meaning of the level of opinion is good.
Score range of 2.61 - 3.40, meaning of the level of opinion is fair.
Score range of 1.81 - 2.60, meaning of the level of opinion is poor.
Score range of 1.00 - 1.80, meaning of the level of opinion is not very poor.

4. RESULTS

The system and procedure for student services with Google Drive of Academic Service Section, Faculty of Science and Technology, that was brought to solve the problem of student services. The system and operation with Google Drive was designed for supporting usage of counter staff only. But it cannot be done directly with the students themselves. It also depends on operators that are done by the students.

The system and procedure that has designed and prepared the application system. It is necessary to study the details of the service staff, the division of roles and responsibilities in the work.

Student Services Procedure with Google Drive

The student service with Google Drive is caused by brainstorming on patterns and procedures. In designing of the Google Drive application model for student services that is divided into 2 parts.

Part 1: filling data on screen. In the detail is key data of student name, appointment code, phone number, service type and the counter staff name. This data will connect to the database of all services. Google

Drive application model was designed with Google Forms. Google Drive application model for student services has designed in part 1 as follows
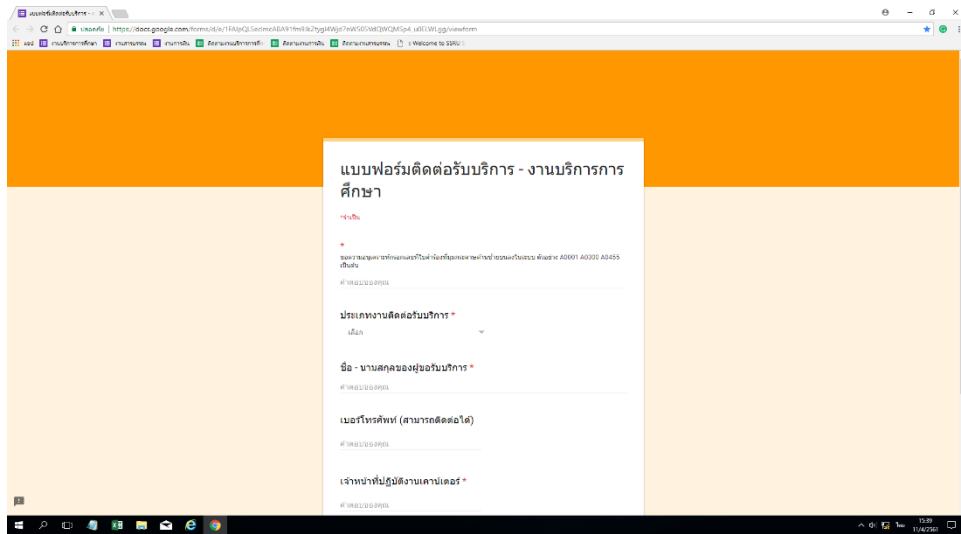

Figure 1. Google Drive application model for student services in part of filling data on screen

Part 2: Sharing on public on the web. It displays information that allows students to easily check the success of their work. The designing detailed information that students need to see and know through the Google Sheet by link sharing on public on the web. Google Drive application model for student services in part 2 as follows

Figure 2. Google Drive application model for student services in part of Sharing on public on the web.

In addition, the procedure step, we designed the student services process with Google Drive. Students can use a request document and the appointment for requesting service only. The process is 7 steps. As figure 3
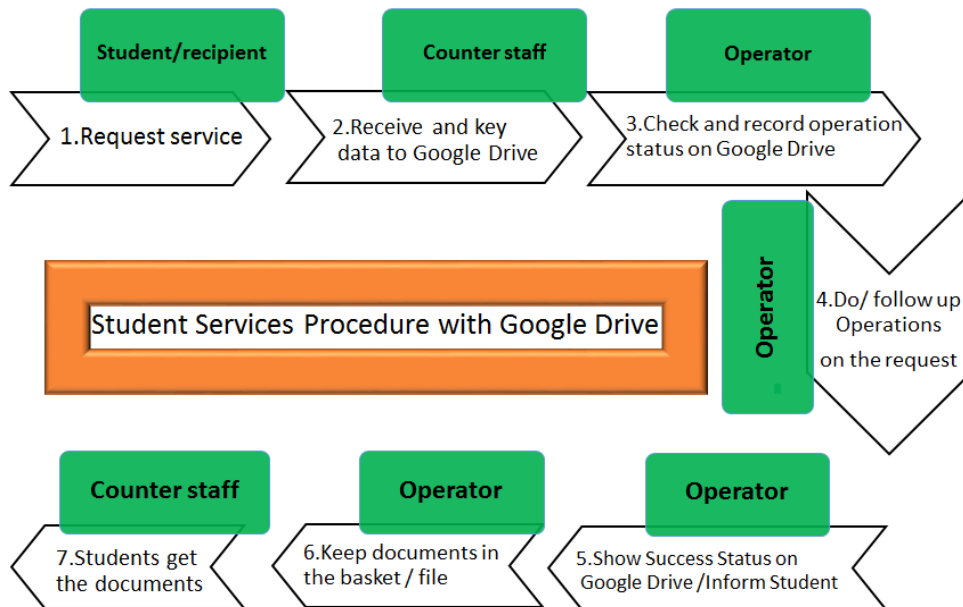
Figure 3. Student Service Procedure with Google Drive

From Figure 3 : It shows student services procedure with Google Drive as follows

1. Service request by submitting a request document and an appointment at the counter, Faculty of Science and Technology.

2. The counter staff receives the request document and fill data into the Google Drive.

3. The operator receives a request document after that checks and records operation staus on Google Drive.

4. The operator does to finish or the other case must do memorandum to relevant agencies and follow up on the request.

5. The operator records the success status of Google Drive for showing success status. Students can follow up their work.

6. The operator keep the finished documents in the basket or put the file.

7. Students contact to receive the finished documents.

The opinion about the services provided to students with Google Drive

Students filled already opinions questionnaire about the student service. The researchers analyzed data of student opinion in all three aspects as the service formats through Google Drive, the process and service process, and the efficiency and quality of services. We considered aspect as follow in table 1.

Table 1.   Mean and standard deviation of opinion about services levels with Google Drive, Academic Service Section, Faculty of Science and Technology in all three aspects as a whole

Student Services Procedure with Google Drive	Opinion Levels		
	Mean $\bar{x}$	Standard Deviation S.D.	Interpretation
1. The service formats through Google Drive	3.861	0.750	Good
2. The process and service process	3.779	0.841	Good
3. The efficiency and quality of services	3.771	0.787	Good
Total Student Services Procedure with Google Drive	3.804	0.794	Good

From Table 1 From Analysis of the results that shows total student services with Google Drive in level good. The mean was 3.804 and the standard deviation was 0.794. In addition to, if you consider at each aspect, you found the most score aspect was the service formats through Google Drive in level good. It was mean of 3.861 and the standard deviation was 0.750. The secondary score aspect was the process and service process in level good. It was mean of 3.779 and the standard deviation was 0.841. The lowest score aspect was the efficiency and quality of services in level good. It was mean of 3.771and the standard deviation was 0.787.

5. CONCLUSION AND FUTURE WORK

The researchers used Google Drive Guild [6] to design and review application pattern. Google drive is used in this study as the system for student service implement. It is used as a standard system for practical work process. From our results, we used google drive for student service for 6 months. We found that operators can fill data in google drive easily. Google drive will show data in google work sheet and status on output sheet automatically. Operators can used data for work process understandably and suitably. Moreover, operators can send the academic requests. Students can monitor work progress by using personal computers, smart phones or tablets.

The researchers asked students for the opinions of google drive service system. The questionnaire is processed by using 350 students from Faculty of Science and Technology, Suan Sunandha Rajabhat University. Then the questionnaire was analyzed and processed using computer program to calculate the statistics such as percentage, mean and standard deviation. From the research results, the opinion about the services provided to students with Google Drive in level good, the researchers summarized and concluded each aspect. Students who are interested the service formats through Google Drive. It is part of the Google Drive application format for using. In the opinion of the students, the design and formatting of the application are appropriate. The menu is easy to use and the access to data through QR code scanning is not very complicated. In aspects of process and service process, it is part of the operation process. The students can easily access the service. The convenience of the service is a simple service process and not complicated, including a contact channel in order to ask and resolve the problem in sufficiently. For the final aspect is the efficiency and quality of services. It is part of the success of the service. Students provide feedback on accuracy and precision of the service system, convenient of getting finished work and monitoring the success of the operation anywhere, anytime.

The benefits of the research are the student service system for educational support services. The system can be used to help in the work to be accurate and effective and increase staff efficiency. Comments from students can improve the format and procedures of services with Google Drive.

The limitation of google drive application for student academic services is bureaucracy process. The data from google drive must be transformed to formal documents that are needed processing time. In addition to, the formal documents will be authorized by Academic Services Division. Academic service section, Faculty of Science and Technology cannot control work processing time. We set work processing time for each academic service requests approximately 7 days. Students will monitor the success of requests after 7 days.

6. ACKNOWLEDGMENTS

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THE OPINIONS OF PERSONNEL FACULTY OF SCIENCE AND TECHNOLOGY TOWARDS E-OFFICE SYSTEM IN SUANSUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

The purposes of this research are to study opinions of personnel faculty of science and technology towards e-office system in SuanSunandha Rajabhat University. This research was intended to investigate 1) determine the opinions of personnel towards the E-office 2) to study suggestion of the personnel faculty of science and technology in SuanSunandha Rajabhat university. By using the questionnaire collects data from 109 sampled. The data were analyzed by percentage, mean, standard deviation define the statistical significance level .05

Most of respondents were females' age between 36– 45 years old, the education graduated in master's degree, academic position. To study personnel opinions found that personnel have the knowledge to use electronic documentation system (e-Office) as well. The electronic documentation system (e-Office) places an indicator system internet access easy to use. The benefits have been found that use of the system menu electronic documentation system (e-Office) easy to use were statistically significant at the .01

Keywords: Opinions, Personnel, Electronic Documentation System, e-Office

1. INTRODUCTION

Presently, the organizations have developed the working system; modern technology is used to improve the performance of the system. It can help in the reduced cost of resources in various areas, especially, in terms of time and cost will be lost with the operation. The bureaucracy in modern times has changed especially the communication between each other, mostly; the use of the data via documents is used in the bureaucratic system; but after the change, the use of electronic information network as a tool for exchanging official information to increase the speed of operation, to reduce the time to send documents and information between each other. The use of an information network connection enhances corporations and exchanges of information in the development process nowadays [1].

Electronic Office System (e-office) is an information technology system for document management. By the Faculty of Science and Technology, the e-office system has been in use since March 1, 2010, according to the policy of Suan Sunandha Rajabhat University; this is to focus on convenience, speed, cost and resources [3]. It also increases the capacity of personnel. And the performance standards in the new governmental management framework, the importance of information technology in today's world, and bringing the electronic system into actual use which is the correct system and full efficiency [2], thus, the researcher views that the personnel opinion in the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the Electronic Office System; the e-Office is to be used as a way to improve the system.

Therefore, the researcher is interested to study the personnel opinion of the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the e-Office system for the development of routine work to research (R2R) in order to benefit the staff's development and the system to work more efficiently.

2. OBJECTIVES

1. Study the personnel opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the Electronic Office System (e-Office).

2. Study the recommendations of the Faculty's personnel of Science and Technology at Suan Sunandha Rajabhat University.

3. METHODS

1. Content

        This study was conducted on the basis of theoretical concepts related to the personnel opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the Electronic Office System (e-Office).

2. Period

        This study was conducted between November 2016 - June 2016 at Suan Sunandha Rajabhat University.

3. Population and sample

        The population included 108 academic staffs and 42 academic support staffs (Department of Human Resource, Faculty of Science and Technology, 2017). The samples were academic personnel and support staff. The sample size was calculated using a Taro Yamane table at a 95% confidence level [6]. The sample size was 109.

Research Activities

        1. Studied the information from books and various sources.

        2. The data obtained from the analysis and synthesis, theories, principles, documents and related research were defined as conceptual frameworks and tools for data collection.

        3. Quality assessments and development of research tools.

        4. Collected data from the sample.

        5. Checked the completeness of the answer, then input the collected data into the statistical program of Social Science (SPSS) which was used to analyze statistical data.

Research Tools

        The research tool used in this study was a questionnaire divided into 3 parts.

        Part 1 is a question about general information.

        Part 2 is a question about the personnel opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the Electronic Office System (e-Office)

        Part 3 deals with suggestions for more effective work development.

Assessment of research tools

        The quality of the research tools was determined by the content validity, and content validity used the method of the Index of Item Objective Congruence (IOC). The reliability of Cronbach's alpha coefficient (Cronbach's) was 0.91, which was within the reliability criterion.

Data Analysis

        The statistic methods used to analyze and interpret data in this research were Percentage, Mean, Standard Deviation and Content Analysis.

4. RESULTS

        The analysis result of personal data on sexuality was mostly female (58.70%), aged between 36-45 years old, had a master's degree (56.90%), had working experience (44.00%), had the academic positions (70.60%); this was in line with the study of Petch Kumkeang (2015), they conducted a survey research on the development of routine work into research (R2R) on the e-Office system, which there was a significant variance in the e-Office system at 0.05. An analysis of the level of personnel opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University, it was found that the average score of opinion on the e-Office was at a moderate level (mean 3.31). When considering each aspect, it found that the mean of opinions

was moderate in all aspects; there was an average of between 2.50 to 3.49. The knowledge of the electronic document system (e-Office) was the most important, and the use of electronic documents (e-Office) was the least important but it was still very important, as shown in Table 1.

Table 1. Opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the Electronic Office System (e-Office).

Opinion	$\bar{X}$	S.D.	Result
Knowledge and Comprehension on the Electronic Office Systems (e-Office)			
1. Have a knowledge and comprehension on the use of e-Office system very well.	3.52	0.63	Many
2. Capability on accessing the system without having to study the manual first.	3.41	0.70	Moderate
3. I can fix the problem without having to ask the system administrator of the Electronic Office System (e-Office).	3.25	0.64	Moderate
4. I can find the document number, title, subject, documents.	3.26	0.75	Moderate
The Use of Electronic Office System (e-Office)			
1. The place to access to e-Office system is easy to connect the Internet.	3.44	0.79	Moderate
2. Computer and internet connection are effective.	3.42	0.79	Moderate
3. The speed of using e-Office via the Internet is sufficient to use.	3.18	0.86	Moderate
4. The stability of the Electronic Office System (e-Office) can be used quickly.	3.11	0.86	Moderate
5 . Duration of recording the Electronic Office System. (e-Office) is fast.	3.10	0.88	Moderate
Benefits			
1. It access to the e-Office system quickly and conveniently.	3.99	0.76	Moderate
2. The use of e-Office menu is easy to use.	4.22	0.82.	Moderate
3. Communication is more systematic and effective.	4.10	0.91	Moderate
4. It is a worth way to manage documents.	3.38	0.77	Moderate
5. Electronic Office System (e-Office) can be easily understood without training.	3.22	0.73	Moderate
Conclusion on the personnel opinions of Faculty of Science and Technology	**3.31**	**0.56**	Moderate

The study of the personnel opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University on the e-Office system can be discussed as follows.

1.The study is found that the majority are female (58.70%), aged between 36-45 years, have master's degree (56.90%) and have working experience (44.00%), have academic positions (70.60%). This is in line with the study of Petch Kumkeang (2015), they conduct the survey research on the development of routine work into research (R2R) on the e-Office system, which there is a significant variance in the e-Office system at 0.05.

2. The personnel opinion of Faculty of Science and Technology at Suan Sunandha Rajabhat University on the e-Office system, it is found that the average score of opinion on the e-Office system is at a moderate level (mean 3.31). When considering each aspect, it is found that the mean of opinions is moderate in all aspects; there is an average of between 2.50 - 3.49. The knowledge of the electronic document system (e-Office) is the most important, and the use of electronic office system (e-Office) is the least important but it is still very important. This is in line with the study conducted by Wilai Sriprapasuk Santi (2010), The personnel use of E-Office system of Assumption Thonburi College, most of the respondents are satisfied with the e-Office system. This is also in accordance with the study of Surapun Pan-Duang (2011), they conduct the

study on the satisfaction level of staffs who work in Aircraft Repair Section at Thai Airways; this is also in line with the study conducted by Mallika Honghirun and Siriporn Laohakul (2007), the study identify factors related to the efficient use of the e-Office system at Chiang Mai University.

5. CONCLUSION AND FUTURE WORK

The study of the personnel opinions of the Faculty of Science and Technology at Suan Sunandha Rajabhat University, the researcher has the following suggestions: The system administrator should develop the system more efficiently and more provide training to the user especially those who come to work. The factors that influence the development of the system should be studied including the database, network device, the e-Office system as well as the budget allocated.

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STUDY ON RETENTION RATE REGARDING STUDENTS OF FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

This work was aimed to investigate retention rate of students who are studying at faculty of science and technology, Suan Sunandha Rajabhat University, Thailand to compare each study program categorized by department for its retention rate. There are 2 departments under this faculty, department of science and department of applied science. Data of this investigation has been collected from 3,757 students from faculty of science and technology who had enrollment from the academic year of 2012 to 2016. This work applied statistical analysis techniques such as percentage, mean, standard deviation, compare mean (T-Test) and analysis of variance (F-Test) to answer research questions and objectives. This study result showed that the retention rates of students from 2 departments are different, department of science and department of applied science. Retention rate of students who belong to department of science is lower than the retention rate of students who belong to department of applied science. Comparison of retention rate analyzed by each study program showed that there is no difference between the retention rates of these departments.

Keywords: Student retention rate, Department of Science, Department of Applied Science, Retention rate comparison.

1. INTRODUCTION

Education is an important tool in the development of the country, such as economic, social, or cultural. Nowadays, any country with educational development is growing up as civilization. That why many country focus on education as same as Thailand that is a once of country has reformed education.

As the National Education Act of B.E. 2542 (1999) that related to encouraging the public to pay more attention of education [1].

Suan Sunandha Rajabhat University is education institution, which has important mission for graduate development in term of quality to being outstanding perspective person, has ability to work, and also including the social responsibility, Moral is an important thing to develop to be acceptable for general public. As well as to continue develop the Thai wisdom into the ASEAN community [2].

A university is an important role in the development of human resources in the country. This is a guideline for young people to make understand and handle the current state of society situation. That why improving the quality of University standards are important because it will help to develop the economy in the same time.

In terms of potential development of personality, analytical thinking, technology development, including term of income statement to get higher life quality, All are related with the quality of educational that why institutions making standard of admission process to selecting candidates who meet the majors qualification need to have students who are able to study and be able to complete their studies in a timely manner [3].

Students are important clients of every university. Therefore, the university has to make a commitment or motivate students. Whether it is loyalty and faith. If students are not attached to the university, it will affect the current rate of students in the university a day and in the future [4].

Faculty of Science and Technology in Bachelor's degree has 14 majors divide into 2 departments following:

First is Science Department, consist of Bachelor of Science (Informatics Mathematics), Bachelor of Science (Chemistry), Bachelor of Science (Biology), Bachelor of Science (Applied Physics), and Bachelor of Science (Industrial Microbiology)

Another is Applied Science Department, consist of Bachelor of Science (Environmental Sciences), Bachelor of Science (Biotechnology), Bachelor of Science (Food Science and Technology), Bachelor of Science (Home Economics), Bachelor of Science (Food Industry and Service), Bachelor of Science (Computer Sciences), Bachelor of Science (Information Technology), and Bachelor of Science (Sports and Health Science)

The faculty aims is produce graduates in higher quality in term of knowledge, ethics, social responsibility, and potential development to be suitable and sustainable. The Student retention is important for university assurance quality. In each academic year, the number of first-year students and the number of students remaining in each academic year is significantly reduced.

From the above-mentioned problem, the researcher, as the facilitator, desire to study and compare the student retention rate in faculty of science and technology of Suan Sunandha Rajabhat University.

By comparison of student retention rates between science and applied science department by classify into each program, to improving the education to be higher quality and efficient.

2. OBJECTIVES

1. To study the retention rate of students of Faculty of Science and Technology Suan Sunandha Rajabhat University.

2. To compare student retention rates by classified base on faculty of science and faculty of applied sciences department.

Research Hypothesis

Researchers have hypothesized to compare the retention rates of science and technology students, Classified by department.

It can be written as a statistical hypothesis following:

H_0: The student retention rate in Faculty of Science and Technology, of faculty science and the faculty of applied Science department is not difference.

H_1: The student retention rate in Faculty of Science and Technology, of faculty science and the faculty of applied Science department is difference

3. METHODS

The population used in this study is the remaining student in Faculty of Science and Technology from the academic year 2012 - 2016, the total is 3,757 people.

Research Tool

1. Using statistics data on enrollment of students in Faculty of Science and Technology, Bachelor's degree in each academic year since 2012 to 2016 and classified by departments program

2. Data collection table to collect, sort out, and analyze data to find the average for the number of students entering and find the average number of missing students in each year.

Data collection

Researchers have planned and defined a systematic collection of data by used secondary data. The collection was design under table for easily data collection and analysis.

Analysis of data and statistics used.

The researcher used the students' statistics enrollment of Suan Sunandha Rajabhat University for calculating by using statistical program under descriptive statistical analysis method for describe the

enrollment number of students from the academic year 2012 to 2016. The number of students was percentage, mean, standard deviation, T-Test, and F-Test.

4. RESULTS

Part 1 Study of the retention rate of students in Faculty of Science and Technology, Suan Sunandha Rajabhat University

The results of the study on the persistence of students of Faculty of Science and Technology, Suan Sunandha Rajabhat University:

Table 1. Provides an Overview of student retention rates.

Academic year	First-year (people)	Retention (people)	Decrease (people)	Percentage of retention	Percentage of missing
2012	624	415	209	66.51	33.49
2013	773	503	270	65.07	34.93
2014	787	516	271	65.57	34.43
2015	855	562	293	65.73	34.27
2016	718	517	201	72.01	27.99
Total amount	3,757	2,513	1,244	66.89	33.11

From Table 1, the retention rate analysis of first year students entering in each academic year 2012 to 2017, Total is 3,757 students. Currently, there are 2,513 students, or 66.89 percent, Decreased by 1,244 students or 33.11 percent.
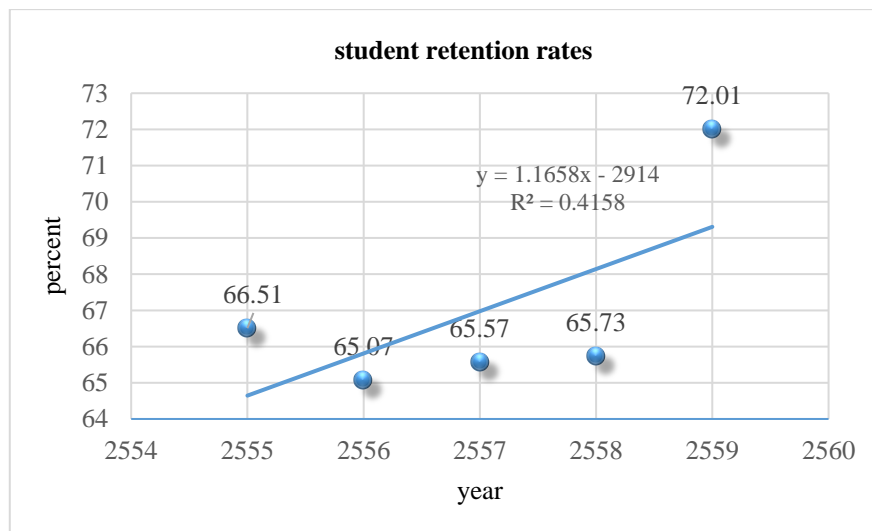
Figure 1. Show the level of student retention rate.

Part 2 Comparative analysis of retaliation rate of students in Faculty of Science and Technology Classified by faculty department

The t-test was used to test the Average between two groups under condition that both groups were independent.

Use the 95% confidence level and reject the null hypothesis (H_0) if the p-value is less than or equal to 0.05. The hypothesis test results are shown in Tables 2 and 3.

Table 2. Comparative analysis of retaliation rate of students in Faculty of Science and Technology Classified by faculty department.

The retention rate	Faculty departments	$\bar{x}$	S.D.	t	df	p-value
The retention rate	faculty of science	63.64	1.38	2.59*	8	0.032
	Faculty of applied sciences	68.17	3.65			

* A significant level at 0.05.

From table 2, the results of the comparison of retaliation rates of students in Faculty of Science and Technology, classified by faculty department using the t-test statistic, the p-value was 0.032, which was less than 0.05, thus rejecting the hypothesis (H_0), which means that the retention rate of the Faculty of Science and Technology students The science department and the department of applied science difference by the department of science, the rate of student retention is lower than the department of applied science.

Table 3. Comparison of retaliation rate of students in faculty of Science and Technology Classified by faculty department.

The retention rate	Variance	df	SS	MS	F	p-value
Classified by faculty department	Between group	13	4473.80	344.138	1.705	0.09
	Same group	56	11305.08	201.876		
	Total	69	15778.88			

* A significant level at 0.05.

Table 3 Results of Comparison of retaliation rate of students in faculty of Science and Technology Classified by faculty department. After using the F-test statistic, the p-value was 0.085, which is greater than 0.05, thus accept the hypothesis (H_0), which means that the retention rate of the Faculty of Science and Technology Each of the majors in the Department of Science and the Department of Applied Sciences is not different.

5. CONCLUSION AND FUTURE WORK

In this study, the student retention rates in science and technology. From the academic year 2012 to 2016, the retention rate is likely to be higher each year. As a result of the comparative analysis of student retention rates by classify in each faculty, it was found that there is a difference in survival in department of applied science holds more than the faculty of science department. As a result, there was no significant difference in retention rates among students.

The researcher studied the concepts and factors affecting the student persistence as follows:

The concepts of Satisfaction in the Environment of Astin Institution show that "the environment of a college such as Friends environment, Teaching environment, Management environment, And the building and location environment all are the effect to the development in student" [5].

Tinto's motivation for education states that there are three main motivations for education, planning in education, expectations in education, and expectations for future careers. These things are influence the education under decision-making about remaining in the institution of the students [6].

The concept of factors influencing institutional commitment and student survival. It consists of personal ability, student background, and financial incentives. The environmental attributes contain with Physical environment involved with the students within the institution, and the interaction design between students and the university [7].

However, there are many factors that effect to the student, and All of factor are reflects the effectiveness of teaching management.

In the next study, the researcher should be study the factors that affect to the student as commitment and retention. For continue improving the quality of education management in part of the Faculty of Science and Technology, Suan Sunandha Rajabhat University.

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SATISFACTION IN THE DISBURSEMENT OF PROJECT FUNDS OF FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

This research aims to study about staff's satisfaction with the disbursement of project funds of faculty of Science and Technology, Suan Sunandha Rajabhat University and compare staff's satisfaction in overall, personnel, and disbursement services process with gender and field of work. The sample was 107 official staff in Faculty of Science and technology by simple random sampling. The questionnaires were used to collect data and analyze by frequency, percentage, mean, standard deviation, and independent t-test.

The results showed that the official staff, most were academic staff and were female, with 1-3 years of experiences, and the frequent of disbursement of Project Funds were 1-3 times per week. In addition, the level of staff's satisfaction among overall, personnel, and disbursement services process aspects were average level. The comparison of staff's satisfaction among overall, personnel, and disbursement services process with gender and field of work were no significant differences at .05 levels.

Keywords: Staffs' satisfaction, Disbursement of project funds, Project Funds, Disbursement Services process

1. INTRODUCTION

The world situation has changed obviously, in political, economic, social and culture aspects, go together with the pressures of changing face of information technology and communication network causing the state of boundless borders. It affects the way of people life and culture. As a result, the demand for change of services and administration policy that emphasizes on efficiency, effectiveness, and quality management. Needs and satisfaction must be considered for customers. Service Quality assessment is a mean to measure the performance and the way to evaluation satisfaction level [1].

The office of Faculty of Science and Technology is responsible for finance. It is the most important unit and related unit in the faculty. The Ministry of Finance regulates and controls public expenditure to ensure all government agencies comply with all rules and regulations related to public finances; and to supply fiscal information, analysis and advice to ministerial top management and other policy-setting bodies [2]. Disbursement process must adhere the correct procedure according to the regulations [3]. Financial related staff should be encouraged to study and thoroughly understand the rules and regulations as well as procedures for the disbursement in order to provide the more efficient service Disbursement system must be clear and swift which also conforms to the regulations of the government. This will satisfy those who receive services [4], [5]. Stated that the satisfaction of disbursement of Faculty of Science and Technology, Suan Sunandha Rajabhat University in overall.

The Faculty of Science and Technology has been allocated the budget for learning and teaching, and providing various academic services, especially the Project Funds as the new disbursement process. The faculty's disbursement process consists of Finance and Supplies unit responsible for the entire faculty's disbursement. Therefore, the researchers were interested in studying the satisfaction of the disbursement of project funds of the Faculty of Science and Technology, Suan Sunandha Rajabhat University in order to be aware of the real needs and points of improvement for the service.

2. OBJECTIVES

The purposes of this research are

1) To study the staff's satisfaction with the disbursement of project funds of Faculty of Science and Technology, Suan Sunandha Rajabhat University.

2) To compare staff's satisfaction in overall, personnel, and disbursement services process with gender and field of work.

3. METHODS

Population: 147 faculty members and staff of the Faculty of Science and Technology, Suan Sunandha Rajabhat University.

Sample: randomly 107 faculty members and staff of the Faculty of Science and Technology by using calculating sample size method of **Taro Yamane** [6].

Tool Questionnaire on the staff's satisfaction with the disbursement of project funds of the Faculty of Science and Technology, Suan Sunandha Rajabhat University

4. DATA ANALYSIS

The questionnaires were analyzed statistically using a computer statistical software packages to calculate the statistics. Descriptive statistics was used to explain personal factors of the staff's satisfaction of the disbursement of the Faculty of Science and Technology, Suan Sunandha Rajabhat University using frequency and percentage to explain the satisfaction level of the disbursement of the Faculty of Science and Technology, Suan Sunandha Rajabhat University using mean and standard deviation. In addition, independent t-test was used for comparing the staff's satisfaction with gender and field of work.

5. RESULTS

The results of the staff's satisfaction of the disbursement of project funds of the Faculty of Science and Technology, Suan Sunandha Rajabhat University are as follow:

Table I. Mean and standard deviation of the staff's satisfaction level for the disbursement of project fund process in personnel aspect

Disbursement of project funds	Satisfaction level		
	$\overline{X}$	S.D.	Interpretation
1. Suitability for dressing	3.64	0.52	Highest
2. Communicate with politeness, humility and friendliness.	3.57	0.62	Highest
3. Willingness and readiness for serve	3.51	0.63	Highest
4. Have the knowledge, expertise. Legislation of University and Ministry of Finance.	3.49	0.60	High
5. Responsible and committed to the operation.	3.46	0.65	High
6. Be creative in the work.	3.46	0.66	High
7. Provide advice, answer questions and provide clear advice.	3.50	0.66	High
8. To solve the problem, the obstacle occurs properly.	3.48	0.69	High
9. Make a good impression and understanding to the service.	3.49	0.70	High
Overall	3.50	0.60	High

Table I shows the mean and standard deviation of the staff's satisfaction level the disbursement of project fund process in personnel aspect of the Faculty of Science and Technology. It was found that the overall staff's satisfaction level for the disbursement of project fund process in personnel aspect of the Faculty of Science and Technology is high ($\overline{X}$= 3.50, S.D. = 0.60).When consider each item, it was found that the staff's satisfaction level in suitability for dressing ($\overline{X}$= 3.64, S.D.= 0.52), communicate with politeness ($\overline{X}$= 3.57, S.D.= 0.62), and willingness and readiness for serve ($\overline{X}$= 3.51, S.D.=0.63) are in highest level satisfaction, respectively.

Table II. Mean and standard deviation of the staff's satisfaction level for service procedure of the disbursement of project funds of the faculty of science and technology

Disbursement of project funds	Satisfaction level		
	$\overline{X}$	S.D.	Interpretation
1. There are signs of the procedure.	3.10	0.61	High
2. Sufficient and appropriate documents for disbursement of project funds.	3.19	0.55	High
3. The process in order.	3.20	0.59	High
4. The service is based on time.	3.19	0.57	High
5. Provide equitable service without discrimination.	3.18	0.61	High
6. Contains advanced equipment.	3.18	0.55	High
7. Transparency process and can be verified.	3.21	0.49	High
Overall	3.18	0.55	High

Table II shows the mean and standard deviation of the staff's satisfaction level for service procedure of the Disbursement of project funds of the Faculty of Science and Technology. It was found that the overall staff's satisfaction level for service procedure of the Disbursement of project funds of the Faculty of Science and Technology is High ($\overline{X}$= 3.18, S.D. = 0.55).When consider each item, it was found that the staff's satisfaction level for service procedure of the Disbursement of project funds of the Faculty of Science and Technology is High for all items. In addition, the mean in transparency process and can be verified item is highest ($\overline{X}$= 3.21, S.D. = 0.49) and the lowest is there are signs of the procedure item.

TABLE III. Mean and standard deviation of the staff's satisfaction level for service process of the disbursement of project funds by overall and individual aspects

Disbursement of project funds	Satisfaction level		
	$\overline{X}$	S.D.	Interpretation
1. Personnel aspect	3.50	0.60	High
2. Service process	3.18	0.55	High
Overall	3.15	0.56	High

Table III shows the mean and standard deviation of the staff's satisfaction level for service process of the Disbursement of project funds by overall and individual aspects of the Faculty of Science and Technology. It was found that the overall staff's satisfaction level for service process of the Disbursement of project funds by overall and individual aspects of the Faculty of Science and Technology is High ($\overline{X}$= 3.15, S.D.= 0.56).When consider each item, it was found that the staff's satisfaction level for service process of the Disbursement of project funds by overall and individual aspects of the Faculty of Science and Technology is high level in personnel aspect ($\overline{X}$= 3.50, S.D.= 0.60) and the satisfaction level in service process aspect is also in high level ($\overline{X}$= 3.18, S.D.= 0.55) respectively.

Table IV. Comparison of satisfaction levels in service provision in the disbursement of funds by the faculty of science and technology suan sunandha rajabhat university by gendER

Disbursement of project funds	Gender	$\overline{X}$	S.D.	t	P-value
1.Personnel aspect	male	3.488	0.553	-.226	.821
	female	3.515	0.638		
2.Service process	male	3..220	0.525	.624	.534
	female	3.152	0.561		
Overall	male	3.220	0.525	1.013	.313
	female	3.110	0.585		

Table IV shows the comparison of satisfaction levels in service provision in the disbursement of funds by the Faculty of Science and Technology Suan Sunandha Rajabhat University by gender. The independent t-test was used to analyze. It was found that the overall and each aspects such as personnel aspect and service process were no significant differences at .05 levels with p-value as .821, .534 and .313 respectively.

Table V. comparison of satisfaction levels in service provision in the disbursement of funds by the faculty of science and technology Suan Sunandha Rajabhat University by field of work

Disbursement of project funds	Field of work	$\overline{X}$	S.D.	t	P-value
1. Personnel aspect	Academic section	3.542	0.649	.907	.366
	operation support	3.429	0.502		
2. Service process	Academic section	3.153	0.548	-.672	.503
	operation support	3.229	0.547		
Overall	Academic section	3.111	0.571	-1.012	.314
	operation support	3.229	0.547		

Table V shows the comparison of satisfaction levels in service provision in the disbursement of funds by the Faculty of Science and Technology Suan Sunandha Rajabhat University by field of work. The independent t-test was used for analyzing. It was found that the overall and each aspects as personnel aspect, service process were no significant differences at .05 levels with p-value as .366, .503 and .314 respectively.

6. CONCLUSIONS AND FUTURE WORK

This research emphasizes the key issue of the results in the opinion about the satisfaction of the disbursement of the financial supplements of the Faculty of Science and Technology. The staff's opinions found that in overall and individual aspects are most average level however in the items such as Suitability for dressing, Communicate with politeness, humility and friendliness, and Willingness and readiness for serve in personnel aspects are high level. It is a good opportunity to use all these opinions to improve and develop in service process for serving staff in Faculty of Science and Technology, Suan Sunandha Rajabhat University.

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WORKING ACTIVITIES AFFECTING GREENHOUSE GAS EMISSION TO THE ENVIRONMENT: A CASE STUDY OF OFFICE OF THE DEAN, FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABTRACT

This research aimed to 1) study on working activities in Office of the Dean, Faculty of Science and Technology, Suan Sunandha Rajabhat University that affect greenhouse gas emission to the environment; and 2) study on the amount of greenhouse gas released by those activities from the office. According to the study, data were collected daily for six months during January to June 2017 and then calculated for greenhouse gas emission to the environment in terms of carbon footprint. As a result of this research, it was found that 1) the main activities in Office of the Dean that affect the emission of greenhouse gas consisted of the use of electric, tap water, paper, the generation of wastes in the office, and fuel consumption by the office vehicles, respectively; and 2) greenhouse gas emission by those activities were found at the average amounts of 432.33, 161.64, 78.02, 45.75 and 20.99 kg CO_2/unit/month by waste generation, the use of electric, fuel consumption, the use of paper, and the use of tap water in the office, respectively.

Keywords: Greenhouse gas, Carbon footprint, Greenhouse gas emission.

1. INTRODUCTION

The current problem of this world, we cannot avoid is the global warming situation, temperature changes in every moment. The scientists identify cause of emissions happened from human activities. The result of the accumulation of greenhouse gases that it will turn into the atmosphere leading to cause of climate change. The largest share of greenhouse gases being identified in the energy sector next is agriculture and following with industries process [1]. However, even an education institution, it will not be identified as part of the greenhouse gas emissions, but in fact within the education institution, there are several activities that are part of the greenhouse gas emissions and have a severe impact on global warming [2].

Thailand as the developing country that should to pay huge fines as stated in the Kyoto Protocol. Although the Kyoto Protocol is nearly expire in the second contract in 2020 [3], because Thailand has reported continual greenhouse gas emissions, and If the government cannot carry out any measurement to reduce greenhouse gas emissions. But due to global warming emissions is constantly increasing. One measure must be taken to stop the problem that would have a serious impact on the world and mankind. By the way, the scientists and those who study the story are well known and aware of the impact that will occur on society and life, if there are still nothing measures to reduce greenhouse gas emissions.

The Faculty of Science and Technology, Suan Sunandha Rajabhat University as a science-related agency, we are always aware the effects of greenhouse gas emissions from various sectors that can be causes of global warming and affect to the world's temperatures as we know as well in name of climate change. The results are severe natural disasters than normal, impact on ecosystems, food production, lifestyles, as well as on economic, and social development [4]. Researchers have recognized to be part of reducing greenhouse gas emissions to reduce the impact of climate change. The research activities are case study in Dean Office Faculty

of Science and Technology, Suan Sunandha Rajabhat University. This will be the base and evidence as a pilot unit in recognizing environmental problems, that agency in under context of Suan Sunandha Rajabhat University and the other supervisory agency will aware and joint operation in the future.

2. OBJECTIVES

1. To study on the activities in the Dean Office, Faculty of Science and Technology, Suan Sunandha Rajabhat University, which impact on greenhouse gas emissions to the environment,

2. To study on the amount of greenhouse gas emissions from various activities and in office of the Dean, Faculty of Science and Technology, Suan Sunandha Rajabhat University.

3. METHODS

Implementation of this research has established procedures to operate as any other in the following order below:

1. Study the issues and objectives regarding to the activity which impact on greenhouse gas emissions within the Dean office, Faculty of Science and Technology

2. Explore and study secondary data, which was collected from various sources. Related to research in terms of information theoretically, academic papers, and any related to be used in the analysis, planning and operational research.

3. Study the general activity in office of the dean, faculty of science and technology by grouping activities with greenhouse gas emissions into 5 main groups as follows:

3.1 Electricity is the amount of electricity that used for various activities in office of the Dean Faculty of Science and Technology. The installation of meters for measuring electricity consumption is metered separately from the public and collected daily (kW).

3.2 Water supply is the amount of water used for various activities in office of the Dean Faculty of Science and Technology; meters are used to measure the water consumption separately from the central meter and daily collected (liter).

3.3 Waste is the amount of waste that is generated from the activities of the staffs and person who come for contact with the Dean Office Faculty of Science and Technology by collecting various types of waste. Occurring each day (kilogram)

3.4 The use of the car is to use the central car of the faculty for official reason by calculating the amount of fuel used per month (liters).

3.5 Other is to conduct activities other than the above mentioned. As The operational activities within the Office of the Dean Faculty of Science and Technology, such as copying, printers, and inks paper used in daily activities (kg)

4. The primary data collection field, by assigning specific storage space within the dean's office, faculty of science and technology. This includes information on electricity usage, water supply, waste generation, central car use, and other information such as the use of paper to copy, inkjet printer.

5. Calculate the amount of greenhouse gas emissions from the above activities. The formula is calculated as follows [5].

Carbon footprint = (activity data x coefficient of each activity) (kg CO_2e / unit)

By definition

Activity data refers to data collected from the various activities. That affects the greenhouse gas emissions.

Coefficient of each activity means the constant value of each activity is determined and accepted by Thailand Greenhouse Gas Management Organization (Public Organization).

4. RESULTS

1. The activities afflicting greenhouse gas emission in office of the dean, Faculty of science and technology.

The research found that operating within the dean office are compounding effect ceases to emit greenhouse gases. Which are classified into 3 categories (five elements) as following detail below:

1.1 Category 1 Direct emission from energy use consists the use of a vehicle resulting from the vehicles from central activity in the official reason travel to various locations, both in Bangkok and provincial.

1.2 Category 2 indirect greenhouse gas emissions from energy consumption consist component as electricity generated in each activity, following 10 activities affect the greenhouse gas emissions following, air conditioner, television, microwave, kettle, hot water dispenser, printer and scanner, and copier.

1.3 Category 3 indirect greenhouse gas emissions, consists of 3 components: water use, paper use, and waste generation. In each component, there are activities that affect the greenhouse gas emissions as following detail below:

1.3.1 The water used activities that affect the greenhouse gas emissions are as follows, using water from the wash basin in the male / female toilet, toilet bowl and bidet, a sink of washing room.

1.3.2 Paper usage consists of paper-based activities within the dean's office in various, including copying, printer and scanner.

1.3.3There are activities that cause waste within the dean's office, including waste, food waste, fruit peels, plastic bags, foam boxes, plastic bottles, and plastic spoons.

2. The amount of greenhouse gases released by office of the Dean, Faculty of science and technology.

The research found that components and activities the greenhouse gases emissions between January 2017 and June 2017, Total amounted is 4,432.35 kg CO_2e / unit, classified by Category 1, 2 and 3, as shown in the table below.

Table 1. The amount of greenhouse gases released from all three activities (classified on a monthly basis) between January 2017 to June 2017.

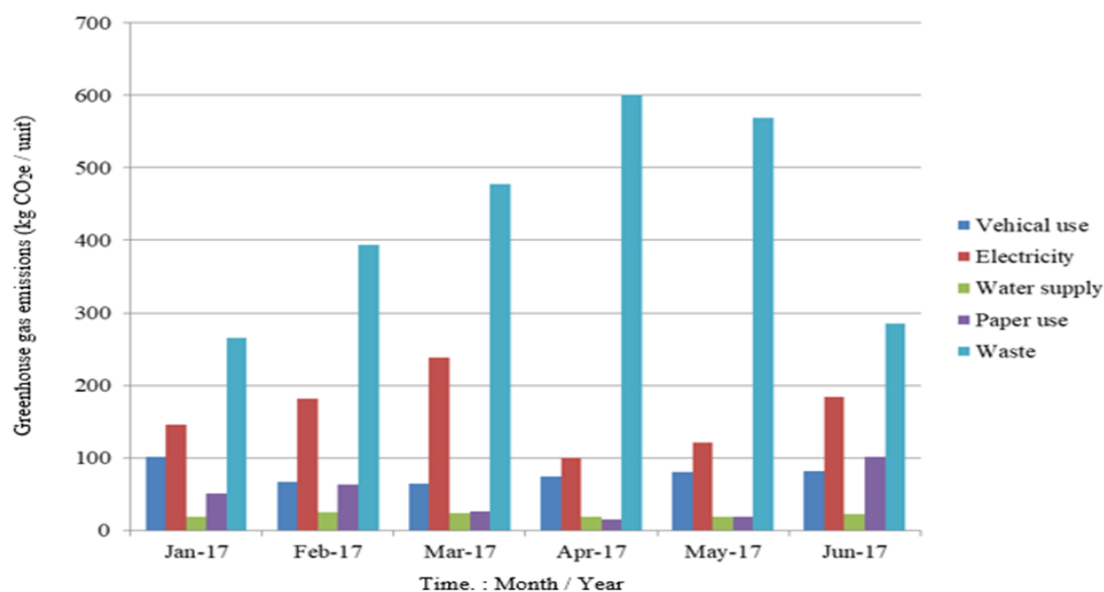| Month / Year	Greenhouse gas emissions from each activity (kg CO_2e / unit)		
	Category 1	Category 2	Category 3
January 2017	101.40	145.29	334.87
February 2017	67.05	181.42	482.15
March 2017	63.80	238.61	527.47
April 2017	74.50	100.16	634.07
May 2017	79.94	120.81	606.30
June 2017	81.43	183.52	409.54
Total	**468.12**	**969.82**	**2,994.41**
Total amount		**4,432.35**	

Figure 1. The amount of greenhouse gases released from five sub-types (classified on a monthly basis) between January 2017 to June 2017.

      2.1 The total amount of greenhouse gases released from first category (central vehicle) by operations during January 2017 to June 2017 was 468.12 kg CO_2e / unit. The representing the average emissions during the month was 78.02 kg CO_2e / unit / month.

      2.2 The amount of greenhouse gases released from the second category (electricity use) during January 2017 to June 2017 was 969.82 kg CO_2e / unit. The average emission was 161.64 kg CO_2e / unit / month.

      2.3 The amount of greenhouse gases released from activity category 3 between January 2017 to June 2017 amounted to 2,994.41 kg CO_2e / unit, classified by activity type as follows.

      2.3.1 The amount of greenhouse gases released from the water supply during January 2017 to June 2017 is 125.95 kg CO_2e / unit, representing the average emissions of monthly was 20.99 kg CO_2e / unit / month.

      2.3.2 The greenhouse gas emissions of paper used from January 2017 to June 2017 amounted to 274.47 kg CO_2e / unit, representing emissions average was 45.75 kg CO_2e / unit / month

      2.3.3 The amount of greenhouse gases emitted by the waste from January 2017 to June 2017 amounted to 2,593.99 kg CO_2e / unit, the emissions during the month average was showed 432.33 kg CO_2e / unit / month

5. CONCLUSION AND FUTURE WORK

      The results of the study concluded the carbon footprints released from all three activities during the period from January 2017 to June 2017. Total 4,432.35 kg CO_2e / unit.

      The highest amount of greenhouse gas emissions was recorded in the category 3, which was 2,593.99 kg CO_2e / unit, followed by activities resulting from the use of electricity (Category 2) and activities resulting from the use of motor vehicles (Category 1), the emission of greenhouse gases is respectively 969.82 and 468.12 kg CO_2e / unit.

      The lowest activity was the activity of water supply (Category 3), with a greenhouse gas emission of 125.95 kg CO_2e / unit, which corresponds to the general description of the Thailand Greenhouse Gas Management Organization (Public Organization), (2011) This indicates that the most common organizational

activities that contribute to greenhouse gas emissions are from most category 3 activities if the organization does not carry out separate waste prior to disposal. Secondly, it comes from the emission of Category 2 from the use of electricity, because the organization uses electricity in various activities throughout the operation period.

The results of this study have various suggestions. This includes issues that should be considered for further research related to greenhouse gas emissions following:

1. Study on the amount of greenhouse gas emissions within the Dean's office, Faculty of Science and Technology, Suan Sunandha Rajabhat University. There should to an extension of the study for at least one year so that the results of the study are clear and can be compared in a period of expansion.

2. In further study of knowledge to find ways to reduce greenhouse gas emissions should be more occur for the greenhouse gas emissions.

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FACTORS CONTRIBUTING TO THE PERCEPTION OF PROFESSIONAL EXPERIENCE TRAINING PROCESS FOR STUDENTS IN THE FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

The purpose of this research was to study the factors contributing to the perception of professional experience training process for students in Faculty of Science and Technology, Suan Sunandha Rajabhat University. In addition,The objective of this research is to studied the relationship between the factors of perception experience of promoting in Faculty of Science and Technology, Suan Sunandha Rajabhat University. The total of 244 persons of the senior students' in Faculty of Science and Technology, Suan Sunandha Rajabhat University was used for sample space. Descriptive statistics and reference statistics e.g., percentage, standard deviation, and standard deviation and Chi square were used in this study.

From study results, the students perception score which is the student orientation project related field experience, and a field experience were very high ($\bar{x}$ = 4.13, $S.D.$ = ± 0.55). Factors to promote awareness in all four aspects are as the following: 1) the public relations board of education services, 2) leaflets, posters, 3) participating orientation field experience programs, and 4) website, They are related perception as a field experience processing of student in Faculty of Science and Technology, Suan Sunandha Rajabhat University.

Keywords: perception of promoting, satisfaction, field experience

1. INTRODUCTION

Nowadays, many educational institutes aim to produce graduates with both theoretical and practical knowledge. Especially, the education is focus on knowledge, competencies and professional skills in accordance with professional standards, or it has the competencies and skills of technical practice in the subject area which is the internship in the establishment or cooperative education. However, the higher education institutions that are a guideline to follow the standard framework for higher education need to the business. In the standard framework, the educational institutes have study and planning of the course, the field experience that is all students must go out to particle professional experience. The educational institutes must plan accordingly, and the course is designed to provide graduates with a high level of education [1].

Suan Sunandha Rajabhat University produces graduates for the labor market. Students are assigned characteristics so that the students and graduates of the institution can graduate and be produced according to the needs of the institution. The quality graduates reflect the study procedure and quality of the university. Students is graduated which is requested by the labor market. The graduates can compete with graduate students from other university. That is the good product or output of the university [2].

The graduates have the knowledge and the performance. They are ready to work in the public and private organization as a quality human resource. The university needs to adjust our teaching strategies to diversify, which is promote learning and develop the potential of the learner. Especially, Strategies should employ with labor market requirements and policies. The development of government education focused on higher education institutions. Graduates with the ability to learn, create, and apply knowledge for self-development can perform and create job to develop society to compete international work conscientiously and acting responsibly based on moral, ethical and correctness [3], [4].

Practical experience of students, corresponding to the identity of Suan Sunandha Rajabhat University, are trained to lead a virtuous, learned to learn and self-help personality. The most importantly, it must be self-improvement, self-responsibility and continuously develop themselves [5].

The trainee is the representative of the University that should have good attitude to work at the organization they attend the training, attentive work and accomplishments as specified by the company. Moreover, the trainee has a quality work which is appropriate for the duration of the internship responsible for both themselves and the others. The trainee must understand the task and work well. So that, the trainee have the ability to learn new things. The trainee has initiative try to create and invent how to work effectively, with discretion and good conscience. The appropriate personality is to know the humility. This is consistent with the desirable characteristics of student's internships and graduate degrees. They are different developing on the nature, type and method of operation of the agency, such as their expertise in the field. Feeling or good attitude accountability skills problems and decisions skills in communication and interaction with the others is the good of the professional experience [6].

In this research, the researcher has conducted research on the factors that affect the promotion of the recognition process for practicing professional experience manual of students in Faculty of Science and Technology, Suan Sunandha Rajabhat University. This research is to help students understand the process steps and procedures correctly and systematically. Objective of this study is to improve the performance which is the most benefit for the company.

2. OBJECTIVES

1. To study the students satisfaction toward the promotion of the perception in the professional experience of the Science and Technology student, Suan Sunandha Rajabhat University.
2. To study the relationship between cognitive enhancement factors and perceptions in the professional experiences of Science and Technology student, Suan Sunandha Rajabhat University.

3. METHODS

1. The population is will apply for undergraduate student 580 peoples in Faculty of Science and Technology which professional experience training.
2. The samples used in this research are sampling from undergraduate students in Faculty of Science and Technology, 4th year, 244 trained professional experience training (Taro Yamane's Theorem) [7].

Research Tool

The research instrument is used the satisfaction questionnaire on the promotion for the perception of the professional experience training process of science and technology student, 244 trained professionals experience training.

Data Collection

In the data collection, the researcher collected data by using questionnaire to collect data from 244 questionnaires. The researcher will check the accuracy and completeness of the answer in the questionnaire. If the answer is not complete, the researcher will ask further information to complete the information.

Analysis of data and statistics used

The data were analyzed by using the application program and statistical as follow: 1) Descriptive statistics to describe the data obtained from the questionnaire such as frequency, percentage, mean and standard deviation 2) Using descriptive statistics and chi square test to analyze data.

The questionnaire was used to analyze data by using computer to calculate statistic using statistical program. The result is described the demographic characteristics of the sample using frequency, percentage and the level of satisfaction toward the promotion of perception of the process of asking for professional experience in Faculty of science and technology students, Suan Sunandha Rajabhat University. In addition, the researcher used descriptive statistics and chi square test to analyze the data.

4. RESULTS

Table 1. The analysis of student satisfaction in promoting the recognition process of professional experiences.

Satisfaction of the students to promote the Recognition process of professional experiences	Satisfaction Levels		
	$\bar{\text{x}}$	SD.	Results
1. Public Service Board of Education	3.56	0.81	High
2. Leaflets / pamphlets / posters	3.19	0.82	Medium
3. The participating student orientation professional experiences	4.13	0.55	High
4. Website	4.05	0.76	High
Overview	3.73	0.74	High

From the Table 1, the analysis of the level student satisfaction promotes the recognition process of professional experiences. That overall satisfaction was high ($\bar{\text{x}}$ = 3.73, SD. = 0.74). Consider an item was shown as 1) the participating student orientation professional experiences was high level ($\bar{\text{x}}$ = 4.13, SD. = 0.55) 2) website was high level ($\bar{\text{x}}$ = 4.05, SD. = 0.76) 3) Public Service Board of Education was high level ($\bar{\text{x}}$ = 3.56, SD. = 0.81) 4) leaflets, pamphlets and posters was medium level ($\bar{\text{x}}$ = 3.19, SD. = 0.82).

Table 2. The analysis was shown the relationship between factors that influence promotes the recognition process of professional experiences of students in the faculty of science and technology of Suan Sunandha Rajabhat University. That is the overall classification and demographic characteristics.

Demographic characteristics	df	χ^2	p-value
Sex	4	3.1200	0.538
Age	24	15.938	0.890
Class-Year	8	17.731[*]	0.230

* The level of significance=0.05

From the Table 2, the analysis was shown the relationship between factors that influence promotes the recognition process of professional experiences of students in the faculty of science and technology Suan Sunandha Rajabhat University. The result has shown the overview of demographic characteristics using statistical Chi-Square. The result has shown follow as, sex and age have P-value=0.538 and 0.890 respectively over 0.05 that means the relationship of sex and age factors influence to promote awareness of the professional between experiences of students in the faculty of science and technology. There is no correlation between the grade found that the P-value = 0.023, which is less than 0.05. This means that the relationship of the class in the factors contributing to the promotion of the recognition process for the professional experiences of students in the faculty of science and technology. There was a correlation significant at 0.05 levels.

Table 3. The analysis was shown the relationship between factors that influence promotes the recognition process of professional experiences of students in the faculty of science and technology of Suan Sunandha Rajabhat University, which is the recognition process of professional experiences.

Factors affecting promoting overall awareness	df	χ^2	p-value
1. Public Service Board of Education	4	27.808*	.000
2. Leaflets / pamphlets / posters	4	22.210*	.000
3. The students attended the orientation program features professional experience	3	18.706*	.000
4. Website		25.201*	.000
	4		

* The level of significance=0.05

From the Table 3, the analysis was shown the relationship between factors that influence promotes the recognition process of professional experiences of students in Faculty of science and technology, Suan Sunandha Rajabhat University. It has shown in 4 aspects. The first aspect is shown in the education service board. The second aspect was shown in the leaflets, pamphlets and posters. The third aspect was shown in the participants student orientation program features professional experiences, and the last aspect was shown in the website. The results were the recognition process of professional experiences by using Chi-Square. It was found that the P-value =0.000, which is less than 0.05. This means that the relationship between factors that influence to promote the recognition process of coaching experience professions in Faculty of science and technology, Suan Sunandha Rajabhat University, and the recognition process of professional experiences have a strong affinity. There was a correlation significant at 0.05 levels

5. CONCLUSIONS AND FUTURE WORK

In this research, the researcher discussed in the important subject as follows: The analysis in the satisfaction of the students using to promote the recognition process of professional experiences founded the overall student's satisfaction is very high level. The participating student's orientation professional experience has very high more than. This is consistent with the concept of Chongcharvoysakul V. [8]. She said the elements of satisfaction in the services involved of the process between service providers and service recipients. As a result have the recognition and the quality of service in which clients should expect to receive.

The analysis has the relationship between factors that influence to promote the recognition process of professional experiences of students in the Faculty of Science and Technology, Suan Sunandha Rajabhat University. It was overview of the demographic characteristics of the class. That is the relationship factors influence to promote the recognition process of professional experiences of students in the Faculty of Science and Technology. There was a correlation significant at 0.05 levels.

The analysis of the relationship between factors influences to promote the recognition process of professional experiences of students in the Faculty of Science and Technology of Suan Sunandha Rajabhat University. It has 4 aspects which consist of the education service, the leaflets, pamphlets and poster. The participant's student orientation program features professional experiences and the website, with the recognition process of professional experiences is related with a strong affinity significant at the 0.05 levels.

This is consistent with the concept of Ruengrujira D. [9]. She proposed the characteristic of the demographic that is the individuals with different demographic characteristics. The behavior is perceived to be different. The analysis has the relationship between factors that influence to promote the recognition process of professional experiences of students in the Faculty of Science and Technology, Suan Sunandha Rajabhat University. It was overview of the demographic characteristics. The result founded the male and the female. have different ideas, values and attitudes including behavioral needs. The female has the trends and the need to send and receive message more the male. Anyhow, the male must have relations arising out of receiving them. Anyway, the education is the important variable for the influence of communication receivers: the

relationship between educations or year of the audience that makes communication as well such as the individuals with higher education has the behavioral recognition, the understanding and the different capabilities.

6. ACKNOWLEDGMENTS

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AWARENESS AND BEHAVIOR ON SOLID WASTE MANAGEMENT OF UNDERGRADUATE STUDENTS IN FACULTY OF SCIENCE AND TECHNOLOGY SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABTRACT

This research aimed to 1) study on awareness and behavioral levels on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University; and 2) compare the awareness and behavioral levels of those students depending on the year and program of their studies. According to the study method, data were collected by using a questionnaire with the sample of 349 undergraduate students and then analyzed statistically by mean ($\overline{X}$), standard deviation (S.D.) and One-way ANOVA at .05 of the significant level. As a result of this research, it was found that 1) the awareness on reduction, reuse, and recycling of solid waste of the students was at the high level ($\overline{X}$ = 3.57) whereas the behavior on these 3Rs was at the moderate level ($\overline{X}$ = 3.29); and 2) the awareness and behavior on reduction, reuse, and recycling of solid waste were not statistically different among all students in the first to the fourth year of their studies [Sig. = .367 and .40 > α (.05)]; however, both awareness and behavior on these 3Rs were different at .05 of the significant level among those who studying in different programs in the faculty [Sig. = .04 and .029 < α (.05), respectively].

Keywords: Awareness, Behavior, Solid waste management, 3Rs (Reduction, Reuse, and Recycling).

1. INTRODUCTION

Nowadays world population has increased very rapidly from year by year. This situation leads to the expansion of urban area in which people tend to migrate and spend their lives in the cities rather than in rural areas especially in the developing and under developed countries. According to World Bank (2012), it was found that the number of urban population all over the world increased from 2,900 to 3,000 million people during the past decade and produced a large amount of solid wastes which increased from 680 to 1,300 million tons per year at the same period. By this reason, the production rate of solid wastes in urban area was reported to increase from 0.64 to 1.2 kilogram per person per day. Moreover, World Bank also predicted that urban population may increase up to 4,300 million people in the year 2025 and will produce 2,200 million tons per year of solid wastes or about 1.42 kilogram per person per day [1].

In Thailand, Pollution Control Department (2017) reported that the amount of municipal solid wastes in the whole country increased from 23.9 million tons in the year 2008 to 27.1 million tons in the year 2016. The production rate of these wastes at that time also increased from 1.03 to 1.14 per person per day. It was also reported that only 9.57 million tons or 35% of municipal solid wastes in the year 2016 were collected and disposed by sanitary landfill and another 5.81 million tons or 21% of those wastes were recycled by different processes [2]. However, almost half of municipal solid wastes in that year or 44% still lacked of appropriated management by the cities around the country. It is, therefore, very important that both local and central government agencies must pay more attention in how to encourage people or any relevant stakeholders to

decrease municipal solid wastes to landfill sites and also to increase those wastes to the recycling processes at the same time.

Suan Sunandha Rajabhat University is located in Dusit district, Bangkok, Thailand on the area of approximately 10 hectares. In 2017, the total number of both under graduate and graduate students together with all academic staff and employees was more than 20,000 people. This number of population seems to increase gradually which leads to the generation of more solid wastes in the campus. According to the study by Thapinta (2010), it was found that the amount of solid wastes generated in Suan Sunandha Rajabhat University was 1,279.6 kg or about 1.3 tons per day during the week day and 1,057.6 kg or about 1.0 ton per day during the week end [3]. It is anticipated that solid wastes in the campus may increase up to approximately 1.5 tons per day by average at this moment. Therefore, the purpose of this study is to investigate the awareness and behavior of undergraduate students in Faculty of Science and Technology, as a case study, in order to encourage them in helping the university to decrease the amount of solid wastes and make the campus be environmental friendly in the future.

2. OBJECTIVES

Objectives of the research on awareness and behavior on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University were as follow:-

1. To study on awareness and behavioral levels on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University, and

2. To compare the awareness and behavioral levels of those students depending on the year and program of their studies.

3. METHODS

The study method of this research can be described according to the following detail:-

1. Population

In this research, population of undergraduate students in the Faculty of Science and Technology, Suan Sunandha Rajabhat University were 2,756 students in the year 2017. They were studying in the 1st to the 4th year of 15 programs which consist of Computer Science, Home Economics, Applied Physics, Applied Statistics, Sport and Health Science, Food Science and Technology, Information Technology, Biotechnology, Chemistry, Industrial Microbiology, Food Industry and Services, Environmental Science, Biology, Informatics Mathematics and Forensic Science, respectively [4].

2. Sample size

The sample size of undergraduate students employed in this study was calculated by using the Taro Yamane's equation [5] as follow:-

$$n = \frac{N}{1 + N(e)^2}$$

Note that

n = corrected sample size

N = population size of undergraduate students

e = Margin of error (MoE) which is equal to 0.05

Therefore, the sample size used in this study was equal to 349 students as shown below:-

$$n = \frac{2{,}756}{1 + 2{,}756(0.05)^2}$$

$$= 349$$

The number of 349 undergraduate students were then selected by stratified sampling technique which was divided into 15 programs of the study. After that, the sample of students in each program were selected again by using simple random sampling technique so that undergraduate students studying in the 1st to the 4th year of each program were prepared for the study.

3. Research equipment

In order to collect data for this research, a questionnaire concerning the awareness and behavioral levels on solid waste management, in terms of 3Rs, was established by means of the project advisor and also the experts in this field. This questionnaire was the equipment employed for this study by distributing to all of 349 sample of undergraduate students from 15 programs in Faculty of Science and Technology, Suan Sunadha Rajabhat University. Then, the data were analyzed in order to achieve the objectives of the research.

4. Statistical methods

4.1 descriptive statistics

The descriptive statistics used in this study were frequency and percentage in order to describe general characteristics of 349 samples which included their sexes, years and programs of the study, respectively. In addition, mean ($\overline{x}$) and standard deviation (S.D.) were also used in order to describe the levels of awareness and behavior on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunadha Rajabhat University.

4.2 Inferential statistics

The inferential statistics used in this study were t-Test and F-Test or One-way ANOVA at the significant level of 95%. In this case, the hypotheses of the study in order to compare levels of awareness and behavior on solid waste management between different groups of sex, year and program of study were as follow:-

H_0: Undergraduate students with different sex, year and program of the study were not different in awareness and behavior on solid waste management.

H_1: Undergraduate students with different sex, year and program of the study were different in awareness and behavior on solid waste management.

4. RESULTS

The results of this research can be described in accordance with objectives of the study. Followings are detail of the results found in this study:-

1. General characteristics of undergraduate students

The number of 349 undergraduate students who were selected as the sample of this research can be described for their general characteristics into 3 items as shown in Table 1.

Table 1. General characteristic of undergraduate students in this study.

General Characteristics		Frequency (student)	Percentage (%)
Sex			
	male	199	57.0
	female	150	43.0
	Total	349	100.0
Year of the study			
	1st year students	94	26.9
	2nd year students	94	26.9
	3rd year students	91	26.1
	4th year students	70	20.1
	Total	349	100.0
Program of the study			

General Characteristics	Frequency (student)	Percentage (%)
Computer Science	51	14.6
Home Economics	24	6.9
Applied Physics	9	2.6
Applied Statistics	30	8.6
Sport and Health Science	49	14.0
Food Science and Technology	15	4.3
Information Technology	60	17.2
Biotechnology	8	2.3
Chemistry	12	3.4
Industrial Microbiology	13	3.7
Food Industry and Services	17	4.9
Environmental Science	28	8.0
Biology	21	6.0
Informatics Mathematics	8	2.3
Forensic Science	4	1.1
Total	349	100.0

2. *Awareness and behavioral levels on solid waste management of undergraduate students*

2.1 Awareness level on solid waste management

It was found that the awareness on solid waste management, in terms of 3Rs, of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University by average was at high level ($\overline{X}$ = 3.57). Among these, the awareness on "recycle" was at the highest level ($\overline{X}$ = 3.78) when compared to the awareness on "reuse" and "reduce" ($\overline{X}$ = 3.59 and 3.35), respectively (Table 2).

Table 2. Awareness level on solid waste management of undergraduate students in Faculty of Science and Technology.

Solid waste management	Mean	S.D	Awareness level	Ranking
Reduce	3.35	1.09	moderate	3
Reuse	3.59	1.03	high	2
Recycle	3.78	0.93	high	1
Average	3.57	1.02	high	

2.2 Behavioral level on solid waste management

It was found that the behavior on solid waste management, in terms of 3Rs, of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University by average was in moderate level ($\overline{X}$ = 3.29). Among these, the behavior on "reuse" was at the highest level ($\overline{X}$ = 3.70) when compared to the awareness on "reduce" and "recycle" ($\overline{X}$ = 3.15 and 3.03), respectively (Table 3).

Table 3. Behavioral level on solid waste management of undergraduate students in Faculty of Science and Technology

Solid waste management	Mean	S.D	Behavioral level	Ranking
Reduce	3.15	1.12	moderate	2
Reuse	3.70	1.07	high	1
Recycle	3.03	1.07	moderate	3
Average	3.29	1.08	moderate	

3. **Comparison of the awareness and behavioral levels on solid waste management of undergraduate students**

   3.1 Comparison of the awareness and behavioral levels by sex

   Table 4 shows the comparison of awareness level on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University by sex. It was found that the awareness in terms of 3Rs between male and female students were not statistical different [Sig. = .652 > α (.05)] which means that either male or female students had the same level of awareness on solid waste management by 3Rs.

Table 4. Comparison of the awareness level on solid waste management of undergraduate students in Faculty of

Science and Technology by sex.

Sex	Mean	t	Sig.
Male	3.45	-2.6506	0.652
Female	3.73		

In addition, it is shown that the behavioral level on solid waste management between male and female students in Faculty of Science and Technology, Suan Sunandha Rajabhat University, in terms of 3Rs, were also not statistical different [Sig. = .645 > α (.05)] which means that both male and female students had the same level of behavior on solid waste management by 3Rs (Table 5).

Table 5. Comparison of the behavioral level on solid waste management of undergraduate students in Faculty of Science and Technology by sex.

Sex	Mean	t	Sig.
Male	3.25	-0.1722	0.645
Female	3.08		

   3.2 Comparison of the awareness and behavioral levels by different year of the study

   Table 6 shows the comparison of awareness level on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University by different year of their studies. It was found that the awareness in terms of 3Rs among the 1st to the 4th year students were not statistical different [Sig. = .367 > α (.05)] which means that either the 1st or the 2nd, the 3rd and the 4th year students had the same level of awareness on solid waste management by 3Rs.

Table 6. Comparison of the awareness level on solid waste management of undergraduate students in Faculty of Science and Technology by different year of their studies

Year of the study	Mean	F	Sig.
1st year students	3.59	1.3774	0.367
2nd year students	3.50		
3rd year students	3.28		
4th year students	3.68		

In the same manner, Table 7 illustrates the comparison of behavioral level on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University by different year of their studies. That is, the behavior in terms of 3Rs of all students from the 1st to the 4th year of study were not statistical different [Sig. = .40 > α (.05)] which means that all of the students studying in different years had the same level of behavior on solid waste management by 3Rs.

Table 7. Comparison of the behavioral level on solid waste management of undergraduate students in
Faculty.of

Science and Technology by different year of their studies

Year of the study	Mean	F	Sig.
1st year students	3.26	1.096	0.40
2nd year students	3.31		
3rd year students	3.30		
4th year students	3.28		

3.3 Comparison of the awareness and behavioral levels by different program of the study

Table 8 shows the comparison of awareness level on solid waste management of undergraduate students in Faculty of Science and Technology, Suan Sunandha Rajabhat University by different program of their studies. It was found that the awareness in terms of 3Rs among the students studying in different programs were statistical different at the significant level of .05 [Sig. = .040 < α (.05)] which means that students had not the same level of awareness on solid waste management by 3Rs when they were in different programs of the study.

Table 8. Comparison of the awareness level on solid waste management of undergraduate students in
Faculty of Science and Technology by different program of their studies.

Program of the study	Mean	F	Sig.
Computer Science	3.489	2.329	0.040*
Home Economics	3.606		
Applied Physics	3.570		
Applied Statistics	3.264		
Sport and Health Science	3.242		
Food Science and Technology	3.813		
Information Technology	3.513		
Biotechnology	3.433		
Chemistry	3.689		
Industrial Microbiology	3.508		
Food Industry and Services	3.678		
Environmental Science	4.024		
Biology	3.832		
Informatics Mathematics	3.600		
Forensic Science	3.400		

Remark: * statistical different at the significant level of .05

When comparing the behavioral level on solid waste management of those students, it was found that their behavior in terms of 3Rs were also statistical different at the significant level of .05 [Sig. = .029 < α (.05)]. That means students learning in different programs in the Faculty of Science and technology had not the same level of behavior on solid waste management by 3Rs (Table 9).

Table 9. Comparison of the behavioral level on solid waste management of undergraduate students in Faculty of Science and Technology by different program of their studies

Program of the study	Mean	F	Sig.
Computer Science	3.375	2.335	0.029*
Home Economics	3.364		
Applied Physics	4.111		
Applied Statistics	2.989		
Sport and Health Science	3.339		
Food Science and Technology	3.498		
Information Technology	3.082		
Biotechnology	3.175		
Chemistry	3.278		
Industrial Microbiology	3.144		
Food Industry and Services	3.098		
Environmental Science	3.450		
Biology	3.267		
Informatics Mathematics	3.383		
Forensic Science	2.867		

Remark: * statistical different at the significant level of .05

5. CONCLUSIONS AND FUTURE WORK

The study on awareness and behavioral levels on solid waste management of undergraduate students was conducted as a case study in Faculty of Science and Technology, Suan Sunandha Rajabhat University, Bangkok, Thailand. The aim of this research was to focus on both awareness and behavioral levels of these students on solid waste management in terms of 3Rs which include "Reduce", "Reuse" and "Recycle", respectively. By the results of this study, it was indicated that the awareness on "Reduce", "Reuse" and "Recycle" of undergraduate students as a whole were at high level, but their behavior on the 3Rs were only at moderate level. This study was also found that undergraduate students with different sex and different year of their studies had no difference on the awareness and behavior on solid waste management in terms of 3Rs. However, students with different program of their studies had the difference on both awareness and behavior on solid waste management by 3Rs.

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USERS' SATISFACTION TOWARD THE SERVICE OF THE CHEMICAL LABORATORY OF FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

This research aim is to find out the users' services satisfaction level toward the services of chemistry laboratory of Faculty of Science and Technology, Suan Sunandha Rajabhat University.258 sample users were conducted to measure the satisfaction towards the services offered by laboratory, in view of 4 factors .(1) the first factor is direct evidence with the following indicators quality of laboratory room.(2) Factor of reliability involves the following indicators materials service ,sufficiency , quality and availability and careful administrative procedures .(3) Factor of consistency involves the following indicators scientific instruments and equipment service. (4) Factor of responsiveness involves the following indicators responsiveness of the staffs in serving the users' services, responsiveness in dealing with the users' services complaints, attitude of the staff. The data were collected using structured questionnaires with graded scale multiple options, ranging from 1 to 5. Independent t-test and analysis of variance were used to test the users' services satisfaction level. The findings revealed that there is significant differences mean of satisfaction between the different users' frequency and more than 75% of the users' services satisfy with the service.

Keyword: Service of Chemistry laboratory, Satisfaction of service, Support learning

1. INTRODUCTION

Laboratory is supporting implement for learning process at the university. Chemistry laboratory is an important facility for education, research, academic service and quality education quality assurance. Chemistry laboratory serves all of the students, lecturers and researchers that were programmed chemistry laboratory works [1]. Moreover, laboratories are used to enhance student understanding of theoretical concepts. It is considered that the importance of laboratories was highlighted in a study [2]. According to the study by Irfan Mushtaq and Shabana Nawaz Khan (2012), learning facilities were the factors that affect the student performance as cited by [3]. Therefore, services of chemistry laboratory must be improved continuously in order to meet the needs of users of services and to contribute the learning process. Quality of academic resources and students' satisfaction in universities has emerged a high profile agenda in the 21st Century. Universities require the resources in order to effectively fulfill their core mandate of teaching, learning and research hence contributing to a fulfilling educational experience for the students [4]. Satisfaction refers to the response of the perception and the expectation toward a service received. The clients are happy and satisfied when their service achieves the expected or exceeded expectations. A study by Lewis found that when student satisfaction increases, students can perceive that their learning is better as cited by [5]. Increasing the level of student satisfaction by the understanding of satisfaction toward students stated opinions and experiences have been of great advantage for students learning .Laboratory management "is the integration and coordination of organizational resources (people, equipment, procedures, supplies) to provide quality laboratory services as efficiently and effectively as possible" [6].Therefore, this study focuses on the satisfaction of users of chemical laboratory, Faculty of Science and Technology, Suan Sunandha Rajabhat University, in view of 4 factors to improve student satisfaction is to also improve the learning.(1) the first factor is direct evidence with the following indicators quality of laboratory room.(2) Factor of reliability involves the following indicators materials service ,sufficiency , quality and availability and careful administrative procedures .(3) Factor of consistency involves the following indicators scientific instruments and equipment service. (4) Factor of

responsiveness involves the following indicators responsiveness of the staffs in serving the users' services, responsiveness in dealing with the users' services complaints, attitude of the staff.

2. OBJECTIVE

This research aim is to find out the users' services satisfaction level toward the services of chemistry laboratory of Faculty of Science and Technology, Suan Sunandha Rajabhat University.

3. METHODS

The research was conducted on the students of Faculty of Science and Technology, Suan Sunandha Rajabhat University, as the users of Chemistry laboratory from October 2017 to March 2018. Structured was used in this research to collect data from 258 students randomly selected using systematic sampling from 685 population unit of students of subjects related the Chemistry laboratory who was enrolled in the academic year of 2017. The questionnaire with grade scale multiple options and a Likert type scale was used to measure the respondent's level of satisfaction and had 3 parts which were background of respondent, Satisfaction of Chemistry laboratory users and more problems and suggestions.The statements included in the questionnaire were clearly stated which base on manual of laboratory safety [7], [8] and aimed at obtaining the needed information about the students' level of satisfaction from the chemistry laboratory services. Reliability was used to the quality test of the instrument by using Cronbach's Alpha Technique that found the reliability of 25 question items met high reliability criteria that was found to be 0.962. The descriptive analysis was used to analyze data to describe the characteristics of score distribution for the research variables. The given mean scale was used to interpret the result of the data gathered: 1.00-1.49- Not Satisfied, 1.50 – 2.49- Less Satisfied, 2.50 – 3.49- Satisfied, 3.50-4.00- Highly Satisfied. Independent t-test and analysis of variance could be used to test the users' satisfaction level toward the chemistry laboratory services by users' objective and users' frequency respectively.

4. RESULTS

Students rating of the satisfaction of laboratory chemistry service were collected on a five point Likert and Likert type scale of not at all satisfied (NS), slightly satisfied (SS), moderate satisfied (MS), very satisfied (VS) and extremely satisfied (ES). Results summarized in Table I showed that students' rating of the satisfaction of laboratory room was above average (M = 3.90, SD = 0.65) implying that laboratory room was comfort, cleanness, safety and had good Information system. More than 75% of the students satisfied the facility of laboratory room that met an expectation of a user .On the satisfaction of the materials service, scientific instruments and equipment and laboratory staff ,the results showed that the students were satisfied with above average ratings. The students' rating of the satisfaction of the materials service was highly satisfied (M = 3.85, SD = 0.68) reflected that the materials were adequate, quality, and availability and there were chemical list, Information of hazardous chemicals, and procedures for borrowing and lending. The satisfaction of Scientific instruments and equipment was highly satisfied (M = 3.80, SD = 0.80) indicated that there was the quality of Scientific instruments and equipment in the chemistry laboratory. The highest a weighted mean of satisfaction was laboratory staff with a weighted mean of 4.03. Most (80%) of the students also concurred that the laboratory staff was willingness and courtesy and they were impressed by the service of the staff.

Table I. Students' Ratings of Satisfaction of Chemistry Laboratory

Factor	Item	ES	VS	MS	SS	NS
laboratory Room	Laboratory cleanness	41	130	45	9	0
		18.2%	52.8%	20.0%	0.4%	0%
	Laboratory working space	51	106	53	12	3
		22.7%	47.1%	23.6%	5.3%	1.3%
	Laboratory lightness	65	117	41	2	0
		28.9%	52%	18.2%	0.9%	0%
	Laboratory ventilation	38	100	72	13	2
		16.9%	44.4%	32.0%	5.8%	0.9%
	Laboratory safety	40	120	55	9	1
		12.8%	53.3%	24.4%	4.0%	0.4%
	Laboratory usage instruction	51	115	54	5	0
		22.7%	51.1%	24.0%	2.2%	0%
	Laboratory services procedures	66	108	44	7	0
		29.3%	48.0%	19.6%	3.1%	0%
Overall mean rating of satisfaction of laboratory room		**Mean=3.90,SD=0.65**				
Materials Service ; Glassware, Chemicals Samples	Sufficiency	45	100	66	10	8
		19.7%	43.7%	28.8%	4.4%	3.5%
	Quality and Availability	49	100	62	14	4
		21.4%	43.7%	27.1%	6.1%	1.7%
	Chemical list	50	89	81	8	1
		21.8%	38.9%	35.4%	3.3%	0.4%
	Information of hazardous chemicals	52	110	60	6	1
		22.7%	48.0%	26.2%	2.6%	0.4%
	Procedures for borrowing and lending	62	116	47	3	1
		27.1%	50.7%	20.5%	1.3%	0.4%
Overall mean rating of satisfaction of materials service		**Mean=3.85,SD=0.68**				
Scientific instruments and equipment	sufficiency	42	102	59	17	7
		18.5%	44.9%	26.0%	7.5%	3.1%
	Availability	43	107	60	13	4
		18.9%	47.1%	25.6%	4.8%	1.3%
	Convenience	48	107	58	11	3
		21.1%	47.1%	25.6%	4.8%	1.3%

Factor	Item	ES	VS	MS	SS	NS
	Procedures for borrowing and lending	52 22.9%	113 49.8%	58 25.6%	3 1.3%	1 0.4%
Overall mean rating of satisfaction of Scientific instruments and equipment		**Mean=3.80,SD=0.80**				
Laboratory staff	Responsibility	63 27.8%	106 46.7%	48 21.1%	10 4.4%	0 0%
	Unbiased	79 34.8%	95 41.9%	40 17.6%	11 4.8%	2 0.9%
	Promptness	67 29.5%	110 48.5%	42 18.5%	8 3.5%	0 0%
	Enthusiasm	70 30.8%	105 46.3%	44 19.4%	8 3.5%	0 0%
	Willingness and courtesy	85 37.4%	96 42.3%	37 16.3%	7 3.1%	2 0.9%
	Service Expertise	89 39.2%	88 38.8%	48 21.1%	2 0.9%	0 0%
	Complain response	77 33.9%	95 41.9%	46 20.3%	9 4.0%	0 0%
	Availability of staff	67 29.5%	86 37.9%	55 24.2%	13 5.7%	6 2.6%
	Impressiveness	81 35.7%	99 43.6%	36 15.9%	10 4.4%	1 0.4%
Overall mean rating of quality of Laboratory staff		**Mean=4.03,SD=0.78**				

The results of independent t-test for differences means of satisfaction between the users' objective in Table II showed that there were no significant differences in satisfaction levels between the users for instruction practice and for research .The ANOVA test results in Table III showed that there were significant differences mean of satisfaction between the different users' frequency for all factors, laboratory room, study participants, materials Service, Scientific instruments and equipment and laboratory staff .The multiple comparison indicated that there were significant differences mean of satisfaction between the frequent users 1-5 times per week and the frequent users 6-10 times per week and there were significant differences mean of satisfaction between the frequent users 6-10 times per week and the frequent users more than 10 times per week but there were no significant differences mean of satisfaction between the frequent users 1-5 times per week and the frequent users more than 10 times per week .These results indicated that expectations of users at different frequencies are different

Table II. Test Results for differences means of satisfaction between the users' objective

Factor	Objective	Mean	Std. Deviation	t	P-Value
Laboratory Room	Class LAB	3.9094	0.6334		
	Research	3.8095	0.7249	0.797	0.426
Materials Service ; Glassware, Chemical Sample	Class LAB	3.8640	0.6651		
	Research	3.6933	0.7979	1.288	0.199
Scientific instruments and equipment	Class LAB	3.8256	0.8001		
	Research	3.5417	0.7990	1.825	0.069
Laboratory staff	Class LAB	4.0519	0.7692		
	Research	3.9037	0.8864	0.973	0.332

Table III. Test Results for differences means of satisfaction between the users' frequency

Factor	F-Statistic	df	P-Value
Laboratory Room	12.972[*]	2,250	0.000
Materials Service ; Glassware, Chemical Sample	10.460[*]	2,251	0.000
Scientific instruments and equipment	14.261[*]	2,251	0.000
Laboratory staff	6.33[*]	2,251	0.002

* Significant difference at p<0.05

5. CONCLUSION AND FUTURE WORK

The satisfaction that appears in the results presented the positive and happy feelings that derive from laboratory being settled with the mean of 3.922. More than 75% of the users' services satisfy with the services and the staff of Chemistry laboratory. Students reported high level of satisfaction emphasized the need for laboratory staff to be responsive to students' needs, the chemistry library having basic safety and comfort for study and having adequate scientific instruments ,equipment and material. Education as a service is provided by the educators who consider both physical and social environment to positively influence student satisfaction [9].

All this findings can help the authorities and policy makers for the improvement of the quality in higher education.

6. ACKNOWLEDGEMENTS

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FACTOR AFFECTING THE PUBLIC RELATIONS TO STUDY OF STUDENTS IN FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

The object was study the influence factor of public relations under decision-making pathway to study in the Faculty of Science and Technology Suan Sunandha Rajabhat University (Sci SSRU). The target samples were 275 undergraduate students of Sci SSRU. The research method using some questionnaires for data collection. There were composed with two-part such as the demographic characteristics of students and the factors influencing public relations admission. The data were performed analyzed percentage, mean, standard deviation, and stepwise multiple regression analysis. The results revealed that factor affecting the public relations to study of students in SciSSRU are the cost living expenses factor (β= .481) and personal liking factor (β= .313) at statistic significant .05 level. Furthermore, the location factor, public relation and physical description factor were not affected factors to decision to study of students. This research benefit applied and developed for public relations advertisement planning on future.

Keyword: public relations, study, educational, institution

1. INTRODUCTION

The public relations are widely recognized and appreciated as important and necessary for every organization. Most types of operational activity are use public relations as a tool to publish stories for make understand and build good relationships between organizations and stockholder [10]. The decision of students to enroll in college education is highly important both student and university that why the Universities should to managed with high effectively, especially in the areas of budget management, business administration, strategy development, academic development including research, and other areas. There are also research findings that marketing competition of International education that it has made Asian students more popular go study abroad. The success factor of the international education market has two main components. That is image and resources. It was found that aggressive and integration cooperation is a variable in the measurement of marketing evaluation contain with history of the institution, reputation financial status, academic quality, the size of the alumni institution and the curriculum, and another component is the alliance and academic services [8].

The public relations are necessity for college as we know the principle of public relations staff should to understand the goals cooperated together with the university's that should to set educate mission clearly. The public relations staff must know the laws regulations and educational functions that they have for the best public relations cover the entire community [1]. The executives nowadays pay more attention to public relations. It can be seen from many higher education institutions from the department / center / public relations department to be the agency responsible for public relations, especially for the purpose of planning strategies to build up the brand awareness perception to earn market share but the higher education institutions are different from the non-profit organization that do not want to generate sales and profit, but the higher education institutions focus on producing graduates to be ready for their careers, research with invention to provide academic services for the community, society, preservation of arts and culture [9].

The Public relations is widely accepted as important and essential for every organization, especially educational institutions, to give importance to public relations as it is important for students to make decisions

and including with the university development that there should be used public relations, along with academic development, research, and other areas. Because of, the relationship between the institution and the community cannot work well without good public relations. The role of public relations officers in higher education institutions should acting as the strategic planning, creating and keep perception, as the other side, market share is focused on producing graduates ready for occupation, has ability provides academic services to the social community and preserves arts and culture. The faculty of science and technology has goal to provide education that focuses on creating quality of graduated who have the knowledge and understanding to meet the needs of the modern society as the current situation changes in the world by including moral and social consciousness. The researcher studied the influence factor of public relations under decision-making pathway to study in Faculty of Science and Technology, Suan Sunandha Rajabhat University. The aim of this research is to provide information into consideration for more effective public relations activities of Science and Technology, Suan Sunandha Rajabhat University

2. OBJECTIVE

To study the influence factor of public relations under decision-making pathway to study in the Faculty of Science and Technology, Suan Sunandha Rajabhat University

3. METHODS

This research is a survey by using questionnaires for data collection. The population was 275 students of Suan Sunandha Rajabhat University using stratified random sampling technique. The independent variables are demographic characteristics, example gender, age, and department. The variable is based on the graduated, expenditures, location of public relations, staff and services, and the Physical appearance. The Statistical Analysis using SD, Regression and inferential statistics analysis that is multiple regression analysis.

4. RESULTS

From the study of science and technology students, Rajabhat University Most of the interviewed respondents were female (59.27%), the majority of respondents were 19 years old, and 64.73% of them studied in the science department and 35.27% were in the applied sciences.

The influence factor of public relations under decision-making pathway to study. It was found that the overall level was very high in each aspect, the first aspect was the Physical appearance, second is the service, following with staff and the graduated. Finally, is the cost of education. All detail is shown in Table 1.

Table 1. The average and standard deviation of the influence factor of public relations under decision-making pathway to study in the Faculty of Science and Technology Suan Sunandha Rajabhat University

The influence factor of public relations under decision-making pathway to study	Level	
	$\overline{x}$	S.D.
1.Graduated	3.90	0.62
2.Expenditures cost	3.81	0.65
3.Location	3.90	0.68
4.Staff	3.91	0.62
5.Service	3.97	0.64
6.Physical appearance	4.00	0.91

The analysis influence factor of public relations under decision-making pathway to study in Faculty of Science and Technology, Suan Sunandha Rajabhat University. First is the cost factor ($\beta = .481$) following with staff factor ($\beta = .313$) at significance level 0.05. For the other factor, as service, location, and physical

appearance did not influence the student's decision to study. As Table 2 below will showing the impact factor that influence of public relations under decision-making pathway to study

Table 2. The influence factor of public relations under decision-making pathway to study

The influence factor of public relations under decision-making pathway to study	Model 1	Model 2
Expenditures cost	.557*	.481*
	(.000)	(.000)
Staff		.313*
		(.006)
R^2	.092	.117
S.E.	1.1369	1.1231
F	27.522*	17.966*
P value of F	.000	.000

* Statistically significant at the .05 level.

5. DISCUSSIONS

1. An opinion of students of Faculty of Science and Technology, Suan Sunandha Rajabhat University, the results showed that the promote of public relations education was very high considering more than other aspects as following the first is the physical aspect, next is service mind, third ranking is the faculty and staff, fourth is the field educational and environment, and the last one is the cost of education. From detail, it shows that the physical of service aspects are the image public clearly see and it also affecting decision to choose study. Consistent with the concept of John Dalton 2005, saying that reputation is the overall visible value of the stakeholders in the organization. It comes from the perception of corporate image and communicate continuously that it is consistent with the research of Natcha Suwannawong (2017) study of factors influencing decision-making study undergraduate education in Rajamangala University of Technology Isan, Nakhonratchasima (Quota system) semester, 2017. The study found that students who responded to the questionnaire has a different level of opinion in each influence factors but the highest of results of the study were the image of the university that affecting the decision to choose study a bachelor's degree in Rajamangala University of Technology Isan, Nakhonratchasima (Quota system) semester, 2017.

2. The influence factor of public relations, Faculty of Science and Technology Suan Sunandha Rajabhat University is cost and staff factor both of factor show that the public relations requires personnel expertise and operational capital. In line with the concept of Savitri muakmeuang (2003), Said that it is necessary to plan the affairs within the public relations department. The planning committee in the public relations department should be established consists of heads of sections within the organization such as head of public relations, head of advertising, head of information to cooperated the job together in each other for get more effective of task.

This committee should be a planning meeting together regularly and set clearly objectives of the public relations in project and research by preparation of schedule time and task, Operations Selection of media, and including budget for public relations projects. Jarewat Tawarat (2012) found that public relations is a planned operation, either by individuals or by public relations organizations, through two-way communication and persuasive persuasion to knowledge build trustworthy reputation by exchanging news between people who want to public relations and the people.

6. RECOMENDATION

1. Suggestions from the research findings are as follows.
    1.1 should create an environment of conducive to continuous learning.
    1.2 Promote the conservation of student uniforms to be a good image to the university.
    1.3 Strengthen the discipline of cleanliness to be beautiful campus

1.4 It should promote the process of providing the accurate information services in areas such as service mind, beaming fast, and trust-able.

1.5 There should be a tracking system, communication Chanel for faster providing information to student.

2. Suggestions for the next research are as follows.

2.1 The development of public relations work for students to gain more information based on the current communication channels of the Faculty of Science and Technology Suan Sunandha Rajabhat University

2.2 Study in patterns of public relations approaches that can be communicated with outsiders Suan Sunandha Rajabhat University.

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THE ENTREPRENEURSHIP FIELD EXPERIENCE DATABASE RECOMMENDATION PROGRAM USING GOOGLE SPREADSHEET:
A CASE STUDY OF THE FACULTY OF SCIENCE AND TECHNOLOGY,
SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

This study has three objectives. First, to create the entrepreneurship field experience database program. Second, to develop a field experience recommendation system for student entrepreneurs in line with their subject field. The last objective is to implement the accessibility database for students, instructors, and staffs to use, in the Faculty of Science and Technology, Suan Sunandha Rajabhat University. The data has been collected for four years from the placement program internship students. The entrepreneur recommendation system was developed according to the students' field of study. Program testing indicates that this system may be used to assist in the selection of the appropriate institution for student entrepreneurial field experience placement. Additionally, the database has also benefited instructors and staffs as a reference and tracking tool, not only make personnel process easier but also it provides more convenient in monitoring student progress.

Keywords: field experience, entrepreneur recommend system, database program

1. INTRODUCTION

In present, information technology is extremely evaluating, and progressing especially internet technologies, which most people can easily access and use through Personal Computer, Smartphone, and any information instruments [1]. Because of easy and quick data transmission and communication nowadays, causes several of beneficial usage of internet technology in many Sectors, Entrepreneurs and especially academics. Such a technology provides students to have great learning sources, cutting-edge research with no boundary, and use for communication between each sector in the organization. In addition, the internet network can be used to publish or inform all kind of content in the form of website [2].

Field Experience Course is Public Policy of Office of the Higher Education Commission's responsible which support the mission or policy of Office of the Higher Education Commission in development and broadcast the knowledge, innovation, technology and etc. Such a factor influences both directly and indirectly to Public and Social [3]. Therefore, Field Experience Course has been part of all curriculums in both public and private university.

Field Experience Course, Faculty of Science and Technology, Suan Sunandha Rajabhat University distributes the responsibility to each instructor of each department to look after those assigned students who participate in the program and students are responsible to coordinate with the entrepreneur by themselves then submit request to Academic Administration to issue a field experience requested letter to the entrepreneur afterwards. However, there are always some problems with missing or incomplete important details from the students and that can results the entrepreneur to reject such a request many times.

Regarding the problem mentioned above, researchers understand and realize it therefore the 'Entrepreneurs for Field Experience' Database Recommendation Program Using Google Spreadsheet: A Case

Study of The Faculty of Science and Technology, Suan Sunandha Rajabhat University, has been developed for all of the users to check, apply and work efficiently in a convenient way.

2. OBJECTIVES

1) To create the entrepreneurship field experience database program.
2) To develop a field experience recommendation system for matching both student and entrepreneurs to in line with their subject field.
3) To implement the database, making it available to use for students, instructors, and staffs, in the Faculty of Science and Technology, Suan Sunandha Rajabhat University.

3. METHODS

This research proposed The Entrepreneurship Field Experience Database Recommendation Program Using Google Spreadsheet: A Case Study of The Faculty of Science and Technology, Suan Sunandha Rajabhat University, which the methods have been explained into 4 sections below;

1. Population and Sampling

1.1 Population

The population is:

1.1.1 The 58th students who study in Bachelor Degree in Faculty of Science and Technology, Suan Sunandha Rajabhat University for 637 people.

1.1.2 The head of each program of the Faculty of Science and Technology, Suan Sunandha Rajabhat University for 14 people.

1.1.3 The Staffs who work under Academic Administration department in Faculty of Science and Technology, Suan Sunandha Rajabhat University for 6 people.

1.2 Sample

The sample is:

1.2.1 The 58th students' Faculty of Science and Technology, Suan Sunandha Rajabhat University for 637 people, and sampling to be calculated is only 248 people. The calculation referred to [4] at 0.05 significant level of deviation. Researchers selected the sampling by Stratified Random Sampling method with department stratification and randomized by population ratio in Table 1.

1.2.2 The head of programs' Faculty of Science and Technology, Suan Sunandha Rajabhat University for 14 people.

1.2.3 The staffs' academic department for 3 people, and the staff's program for 3 people.

2. Research Instrument

2.1 The Entrepreneurship Field Experience Database Recommendation Program Using Google Spreadsheet

2.2 Satisfaction Questionnaire: The Entrepreneurship Field Experience Database Recommendation Program User Satisfaction is divided into 3 parts;

Part 1: Users' characteristics by giving basic information by answering 3 questions in the questionnaire

Part 2: Using Entrepreneurship Database Satisfaction as Likert scales which has 5 levels; very good, good, moderate, low, and very low. This part consists of 8 items

Part 3: Satisfaction in efficiency and usefulness of Entrepreneurs Database Satisfaction as Likert scales, 5 levels are very good, good, moderate, low, and very low. This part consists of 6 items.

Table 1. The 58th students' Faculty of Science and Technology, Suan Sunandha Rajabhat University

Department	Population	Sample
Science	**182**	**69**
- Informatics Mathematics	13	5
- Chemistry	21	8
- Industrial Microbiology	27	10
- Biology	54	21
- Applied Physics	22	8
- Applied Statistics	45	17
Applied Science	**455**	**179**
- Home Economics	34	13
- Biotechnology	17	7
- Information Technology	109	45
- Sport Science and Health	95	37
- Food Science and Technology	29	11
- Computer Science	78	30
- Environmental Science	49	19
- Food and Service Industry	44	17
TOTAL	**637**	**248**

Researchers define questionnaire scores in 5 levels respectively as follows; very good = 5, good = 4, moderate = 3, low = 2, and very low = 1.

In term of satisfaction levels has been defined as follows; very good = 4.50-5.00, good = 3.50-4.49, moderate = 2.50-3.49, low = 1.50-2.49, and very low = 1.00-1.49 by Mean [5].

Tools Creation Process

1. Study from documents and Literature reviews

2. Created Entrepreneurship Field Experience Database Recommendation Program

3. Created Satisfaction Questionnaire

4. Take Entrepreneurship Field Experience Database Recommendation Program and Satisfaction Questionnaire presented to advisor to check and further discuss

5. Adjust Entrepreneurship Field Experience Database Recommendation Program and Satisfaction to completely

3. Data Collection

3.1 Entrepreneur Data Collection has been processed in order to create Entrepreneur Field Experience Database Recommendation Program since 2014-2017 CE, selecting from entrepreneur who responded with acceptance only, and specify recommended levels' entrepreneur by Mean of 3 criteria in Table 2.

3.2 The questionnaire data collect from sampling for 288 people from January to March 2018.

Table 2. Specification Recommended Levels

Specification	Mean	Recommended Levels
	4.50 – 5.00	Very high
Frequency Accepted	3.50 – 4.49	High
Assignment of duties	2.50 – 3.49	Moderate
Entrepreneur Reliability	1.50 - 2.49	Low
	1.00 - 1.49	Very low

4. Data Analysis and Statistics

Researchers checked all questionnaire data have been completed correctly, and statistical analyses with statistical package are as follows;

4.1 Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurs with Field Experience Database Recommendation Program classified by gender and department using independent t-test for 2 groups.

4.2 Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurs with Field Experience Database Recommendation Program classified by personnel using Levine's test [6].

4. RESULTS

1. Development results of The Entrepreneurship Field Experience Database Recommendation Program Using Google Spreadsheet, using by students, instructors, and staffs is illustrated in Figure 1. The program has 4 parts which are Programs, Recommended Levels, Recipient's name or position, and Address, respectively. The "Filter" function can be applied when users want to look up for a specific data such as Programs, Recommended Levels, and Province at any rate.

Figure 1. The Entrepreneurship Field Experience Database Recommendation Program

2. Researchers release a beta version of the Entrepreneurship Field Experience Database Recommendation Program to students, head of programs, and staffs to test and feedback then see their answer in the questionnaire, result is as follows;

2.1 Comparison of results regarding Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field Experience Database Classified by Gender.

Table 3. Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field Experience
    Database Classified by Gender.

Questionnaire	Gender	x̄	S.D.	t	p-value
1. Database System Using					
1.1 Completeness Data	Male	4.1008	.49757	-.447	.655
	Female	4.1295	.54950		
1.2 Data Recency	Male	4.1318	.56430	-1.904	.058
	Female	4.2590	.52940		
1.3 Format Compatibility	Male	4.1008	.48161		
	Female	4.2014	.55403	-1.590	.113
1.4 Database Reliability	Male	4.1860	.54152	-.995	.321
	Female	4.2518	.53964		
1.5 Using Convenience	Male	4.0775	.52459		
	Female	4.2662	.54607	-2.884	.004*
1.6 Interestedness's Data	Male	4.0620	.54129		
	Female	4.2230	.56521	-2.382	.018*
1.7 Data Variety	Male	4.0388	.45763		
	Female	4.1511	.57627	-1.773	.077
1.8 Database Utility	Male	4.1085	.48799	-1.293	.197
	Female	4.1871	.50459		
2. Efficiency and Utility of Database					
2.1 The system not complicated	Male	4.1318	.50590		
	Female	4.2302	.52910	-1.557	.121
2.2 Easy Access	Male	4.1318	.62973	-1.419	.157
	Female	4.2446	.66857		
2.3 Quick Response	Male	4.1008	.51303		
	Female	4.2662	.62061	-2.385	.018*
2.4 Data have Correctness and Completeness	Male	4.0775	.53928		
	Female	4.2086	.63102	-1.833	.068
2.5 Data Utility for User	Male	4.1163	.56772	-1.956	.052
	Female	4.2518	.56586		
2.6 Using Manual has easily understood	Male	4.0465	.48187		
	Female	4.1367	.54109	-1.443	.150

  * 0.05 significance level

Table 4. Overview of Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field Experience
Database Classified by Gender.

Satisfaction	Gender	x̄	S.D.	t	p-value
1. Database System Using	Male	4.1008	.33587	-2.439	.015*
	Female	4.2086	.38407		
2. Efficiency and Utility of Database	Male	4.1008	.39165	-2.364	.019*
	Female	4.2230	.45024		

* 0.05 significance level

Table 3 illustrates the satisfaction of each item when classified by gender. Using usage convenience, interesting Data, and Quick Response; there is 95% confidence interval reflects a significance level of 0.05, showing that more female is satisfying than male, also when consider Table 4 which is an overview of satisfaction, showing that female is satisfying more than male in using Database System, Efficiency, and Utility of Database at 95% confidence interval reflects a significance level of 0.05. However, average scores' for both Male and Female in satisfaction levels is "good".

2.2 Comparison of results about Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field Experience Database Classified by Department.

Table 5. Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field Experience
Database Classified by Department.

Questionnaire	Department	x̄	S.D.	t	p-value
1. Database System Using					
1.1 Completeness Data	Science	4.0260	.32339		
	Applied Science	4.1543	.58742	-2.270	.024*
1.2 Data Decency	Science	4.2338	.53548	.711	.478
	Applied Science	4.1809	.55620		
1.3 Format Compatibility	Science	4.1039	.44675		
	Applied Science	4.1755	.54335	-1.110	.268
1.4 Database Reliability	Science	4.2468	.49086	.536	.592
	Applied Science	4.2074	.56127		
1.5 Using Convenience	Science	4.2208	.47637	.904	.367
	Applied Science	4.1543	.56892		
1.6 Interestedness's Data	Science	4.0909	.51763	-1.044	.297
	Applied Science	4.1702	.57837		
1.7 Data Variety	Science	4.1299	.43982	.492	.623
	Applied Science	4.0957	.53875		
1.8 Database Utility	Science	4.1039	.34734		
	Applied Science	4.1596	.54337	-.994	.321
2. Efficiency and Utility of Database					
2.1 The system not complicated	Science	4.2208	.47637	.794	.428
	Applied Science	4.1649	.53682		
2.2 Easy Access	Science	4.2468	.58839	.926	.355
	Applied Science	4.1649	.67771		
2.3 Quick Response	Science	4.1429	.38778		
	Applied Science	4.2074	.63292	-1.011	.313

Questionnaire	Department	x̄	S.D.	t	p-value
2.4 Data have Correctness and Completeness	Science	4.1948	.53898	.904	.367
	Applied Science	4.1223	.61264		
2.5 Data Utility for User	Science	4.1948	.48772	.180	.857
	Applied Science	4.1809	.60236		
2.6 Using Manual has easily understood	Science	4.1039	.41626	.192	.848
	Applied Science	4.0904	.55434		

* 0.05 significance level

Table 6. Overview of Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field

Experience Database Classified by Department.

Satisfaction	Department	x̄	S.D.	t	p-value
1. Database System Using	Science	4.1445	.27059	-.359	.720
	Applied Science	4.1622	.39774		
2. Efficiency and Utility of Database	Science	4.1840	.31598	.499	.618
	Applied Science	4.1551	.46476		

Table 5 displays the satisfaction with each item by department classification. Completeness Data has 95% confidence interval reflects a significance level of 0.05, which Department of Applied Science is more satisfying than Department of Science, and when considering Table 6 which is an overview of satisfaction, shows that there is no significant difference between Department of Science and Department of Applied Science in Database System Using, Efficiency, and Utility of Database. Anyhow, the average scores in Department of Science and Department of Applied Science gives satisfaction in "good" level.

2.3 Results Comparison of Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field Experience Database Classified by students, instructors, and staffs.

Table 7. Overview of Satisfaction of Database System, Using Efficiency, and Utility of Entrepreneurship Field

Experience Database Classified by Personnel.

Personnel	x̄	Students	Instructors	Staffs
		4.1331	4.2143	4.6667
Students	4.1331	-	-.081 (.549)	-.534* (.204)
Instructors	4.2143	-.081 (.549)	-	-.452 (.061)
Staffs	4.6667	-.534* (.204)	-.452 (.061)	-

* 0.05 significance level

When consider Table 7 as overview of satisfaction illustrates that staffs are more satisfying than students in Database System Using, Efficiency, and Utility of Database at 95% confidence interval reflects a significance level of 0.05. However, average scores's from students and instructors is "good" satisfaction level and staffs have "very good" satisfaction level.

5. CONCLUSION AND FUTURE WORK

１．The result of The Entrepreneurship Field Experience Database Recommendation Program Using Google Spreadsheet Development; The users can access to the Entrepreneurship Field Experience Database Recommendation Program from 2 ways as Faculty of Science and Technology's Official website (https://sci.ssru.ac.th/page/fieldexp), and QR Code Scanning. Users can access and easily use through Personal Computer, Smartphone, and any information instruments, which consistency with research's Vichivanives, R., & Poonsilp, K. mentioned that most students of Computer Science Program, Faculty of Science and Technology, Suan Sunandha Rajabhat University are usually using internet from home or dormitory from 5 pm. to 12:00 am [7].

２．Considering Gender and Department satisfaction, illustrate that the satisfaction levels is "good", which is consistent with research of Aonvises., A., & Worakullatthanee., K. which mentioned about the relation between satisfaction and utility [8].

３．When considered satisfaction by personnel which are students, instructors, and staffs shows that the staffs have the highest satisfaction regarding the benefit by utilizing and applying it with different work process.

In the future, researchers will further develop in modifying data annually and change platform to service as a website which can provide a large amount of specific data. In addition, researchers will include the welfare data of each entrepreneur in order to satisfy the users need.

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FACTORS ASSOCIATED WITH FOOD CONSUMPTION BEHAVIOR OF STUDENT IN SPORTS SCIENCE AND HEALTH, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

The Purpose of this study was to study Food Consumption Behavior of student in Sports Science and Health, Suan Sunandha Rajabhat University. The participants included 101 early studying in the 3rd year of Sports Science and Health were 74 males and 27 females. All participants were asked to complete a of questionnaires their perceived benefits, Perceived barriers, perceived self-efficacy, interpersonal influence and their Food Consumption Behavior. The first 3 Food Consumption Behavior that the participants usually practice were drinking milk, drinking water and complete the dish ever though they feel full. Some students were drink soft drinks and have some sweetened snack while rarely eating vegetables and fruits. The responding to the questionnaire found that Food Consumption Behavior of students were result from perceived benefits and perceived self-efficacy. Therefore, to develop Food Consumption Behavior of students, should promote in perceived benefits and perceived self-efficacy for students are able to control their Food Consumption Behavior at all times.

Keyword: Food Consumption Behavior, perceived benefits, perceived self-efficacy

1. INTRODUCTION

Food Consumption Behavior has a relationship with the health and growth of student in Sports Science and Health, Suan Sunandha Rajabhat University. Having proper habits will help student get the nutrients and energy they need and help prevent illness or illness that may occur such as overweight or obese. However, it was found that most of the students had behaviors eat the wrong food. Eat starch on a regular basis and eat fewer fruits and vegetables. Moreover, some students do not eat breakfast make them more hungry. In addition to eating food consumption Behavior, which are personal factors, there are also other factors for example support from other people around the food affects the student.

A study of factors affecting the behavior of student in this study used the concept of promoting behavioral health of Pender. The variables studied are Perceived benefits of action is the understanding or positive perception of a person that the behavior and consequences of behavior, Perceived barriers to action is understood that there are obstacles to doing that the person does not act or avoid doing the behavior, perceived self-efficacy is their perceived ability to practice behavior. If a person is confident in his or her ability, it will behave accordingly and Interpersonal influences is an understanding of the person's behavior, beliefs, or attitudes toward the behavior such as family.

Understanding of eating behavior and influence of this variable on Food Consumption Behavior of students is one way to help plan, support, or change students' Food Consumption Behavior. This will help to prevent overweight and obesity in students. The Food Consumption Behavior that occurs in this age will affect the health as an adult. Researchers are interested in studying Food Consumption Behavior and factors affecting eating behavior of student.

2. OBJECTIVE

The Purpose of this study was to study factors associated with Food Consumption Behavior of student in Sports Science and Health, Suan Sunandha Rajabhat University

3. METHODS

1. Population
The participants included 101 early studying in the 3rd year of Sports Science and Health were 74 males and 27 females.

2. The instruments used in research
The questionnaire consisted of 3 parts: General information of the sample, a questionnaire on Food Consumption Behavior of students and Factors associated with Food Consumption Behavior of student in Sports Science and Health, Suan Sunandha Rajabhat University.

Part 1: General information of the sample an open-ended and closed-end questionnaire ask for information on sex, weight, height and parents.

Part 2: a questionnaire on Food Consumption Behavior of students, there are 15 questionnaires by Identify Food Consumption Behavior with different foods.

Part 3: Factors associated with Food Consumption Behavior of student in Sports Science and Health, Suan Sunandha Rajabhat University divided into perception of the benefits of good eating, Perception of Obstacles to good eating food, Self-efficacy in eating well and Influenced by people.

3. Data Analysis
The data were analyzed in the following.

(1) Comparison of students' Food Consumption Behavior between males and females. The statistic was independent sample t-test with the level of 0.05 statistical significance.

4. RESULTS

Table 1. Percentage of sample by Food Consumption Behavior of males.

Food Consumption Behavior	Behavior			
	Never	Sometime	often	always
1. Drink milk	0.00	2.70	2.70	94.59
2. Drink water	1.35	1.35	4.05	93.24
3. Complete the dish ever though they feel full	1.35	2.70	4.05	91.89
4. Boiled food	2.70	2.70	5.41	89.19
5. Drink soft drinks	4.05	4.05	6.76	85.14
6. Eat spicy food	5.41	4.05	9.46	81.08
7. Eat Dessert.	8.11	10.81	8.11	72.97
8. Eat fried foods	10.81	10.81	10.81	67.57
9. Eat starch	13.51	10.81	13.51	62.16
10. Eat rice less than **2** scoop of rice	20.27	12.16	14.86	52.7
11. Eat vegetables	35.14	22.97	14.86	27.03
12. Eat fruit	40.54	22.97	16.22	20.27
13. Calorie calculation	45.95	22.97	17.57	13.51
14. Drink tea or coffee	51.35	24.32	20.27	4.05
15. Eat grilled food	52.70	21.62	22.97	2.70

* level of 0.05 statistical significance.

Table 2. Percentage of sample by Food Consumption Behavior of females.

Food Consumption Behavior	Behavior			
	Never	Sometime	often	always
1. Drink tea or coffee	3.70	3.70	18.52	74.07
2. Eat spicy food	3.70	7.41	22.22	66.67
3. Complete the dish ever though they feel full	7.41	11.11	18.52	62.96
4. Eat Dessert	7.41	14.81	18.52	59.26
5. Drink soft drinks	7.41	18.52	18.52	55.56
6. Drink water	7.41	14.81	25.93	51.85
7. Boiled food	11.11	18.52	22.22	48.15
8. Eat fried foods	11.11	22.22	18.52	48.15
9. Eat starch	25.93	14.81	14.81	44.44
10. Eat rice less than **2** scoop of rice	25.93	18.52	18.52	37.04
11. Eat vegetables	29.63	11.11	37.04	22.22
12. Eat fruit	33.33	11.11	33.33	22.22
13. Calorie calculation	33.33	11.11	40.74	14.81
14. Drink milk	48.15	33.33	7.41	11.11
15. Eat grilled food	51.85	25.93	11.11	11.11

* level of 0.05 statistical significance.

5. CONCLUSION

The participants included 101 early studying in the 3rd year of Sports Science and Health were 74 males and 27 females. The participants eat three meals a day, 25 percent. There are overweight or obese 30 percent and lower body weight 20 percent.

For males, the first 3 Food Consumption Behavior that the participants usually practice were drinking milk, drinking water and complete the dish ever though they feel full while some students were drink soft drinks, and have some sweetened snack while rarely eating vegetables and fruits.

For females, the first 3 Food Consumption Behavior that the participants usually practice were Drink tea or coffee, Eat spicy food and Complete the dish ever though they feel full while some students were drink soft drinks, and have some sweetened snack while rarely eating vegetables and fruits.

When testing the Perceived benefits of action, Perceived barriers to action, Perceived self-efficacy and Interpersonal influences with Food Consumption Behavior of student found that Food Consumption Behavior of students were result from perceived benefits and perceived self-efficacy.

6. DISCUSSION

1. Food Consumption Behavior of student in Sports Science and Health, Suan Sunandha Rajabhat University

For males, the first 2 Food Consumption Behavior that the participants usually practice were drinking milk, drinking water are good consumption and some participants have inappropriate eating habits such as Complete the dish ever though they feel full, Drink soft drinks and Eat Dessert were the cause of obesity and overweight.

For females, the first 2 Food Consumption Behavior that the participants usually practice were Drink tea or coffee, Eat spicy food and Complete the dish ever though they feel full and some participants have inappropriate eating habits such as Eat Dessert, Drink soft drinks and have some sweetened snack while rarely eating vegetables and fruits were the cause of obesity and overweight.

When compare males and females, it was found that females are obesity and overweight than males because males are good consumption then females.

2. Food Consumption Behavior of students were result from Perceived benefits of action, Perceived barriers to action, perceived self-efficacy and Interpersonal influences.

Considering from Perceived benefits of action, Perceived barriers to action, perceived self-efficacy and Interpersonal influences found that Food Consumption Behavior of students were result from perceived benefits of action and perceived self-efficacy.

For males, the perceived benefits of action of students were result from students understand the benefits of good food and Self-efficacy perception influenced student Food Consumption Behavior in this research may be born of students who have developed their own identity and confidence to control food consumption situation. Students know that they can control their own food choices.

For females, the perceived benefits of action of students in this research may be born students do not understand the benefits of good food and Self-efficacy perception influenced student Food Consumption Behavior in this research may be born of students who cannot control their own food choices.

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SATISFACTION IN SERVICE PROCESS OF SUPPLY INVENTORY UNIT OF FACULTY OF SCIENCE AND TECHNOLOGY SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

This research aims to study about staff's satisfaction in the service process of supply inventory unit of faculty of Science and Technology, Suan Sunandha Rajabhat University and compare staff's satisfaction with gender and field of work. The sample was 107 official staff in Faculty of Science and technology by simple random sampling. The questionnaires were used to collect data and analyze by percentage, mean, and standard deviation.

The results pointed that the official staff most was female in academic staff, with 0-5 years of experiences, and income was more than 30,000 Baht. In addition, the level of staff's satisfaction both overall and each aspects (Personnel, Supply Inventory Process, and location) were in high level. The comparison of staff's satisfaction in overall and each aspect with gender were statistically significant differences at .05 levels. However, the comparison between staff's satisfaction in overall, personnel, and supply inventory process unit with field of work were no significant differences at .05 levels.

Keywords: Staffs' satisfaction, Supply Inventory Unit, Service Process

1. INTRODUCTION

The Government has the one important mission; a service process of supply inventory is the service process to serve staff in the government office in control disbursement material, report inventory data, reordering and storing material for supporting the demand of user [1], [2], [3] pointed that operating process with correct and update data in supply inventory process is a benefit for the office. Faculty of science and technology, Suan Sunandha Rajabhat University is a government office that in charge of supply inventory for all staff. Therefore, the researchers were interested in studying the satisfaction in service process of supply inventory of the Faculty of Science and Technology, Suan Sunandha Rajabhat University in order to be aware of the real needs and points of improvement for the service.

2. OBJECTIVES

1. To study the staff's satisfaction in the service process of supply inventory of Faculty of science and Technology, Suan Sunandha Rajabhat University

2. To compare staff's satisfaction in the service process of supply inventory of Faculty of science and Technology, Suan Sunandha Rajabhat University by gender and field of work.

3. METHODS

The population in this research is 147 members who are the academic and official staff of Faculty of Science and Technology.

The randomly 107 faculty members and staff of the Faculty of Science and Technology by using calculating sample size method of Taro Yamane [4] were used in the research.

The tool in this research is a questionnaire in satisfaction in the service process of supply inventory of Faculty of science and Technology, Suan Sunandha Rajabhat University.

DATA ANALYSIS

The researcher analyzes statistics by using statistical packages Program. Descriptive statistics was used to evaluate the staff's satisfaction by frequency, percentage, mean and standard deviation. In addition, inferential statistics was used to interpret the comparison of staff's satisfaction with gender and field of work.

4. RESULTS

The results of staff's satisfaction in service process of supply inventory unit of Faculty of Science and Technology, Suan Sunandha Rajabhat University was shown in Table I – V.

Table I. Mean and standard deviation of satisfaction in the service process of supply of faculty of science and technology level for the personnel

Personnel	Satisfaction level		
	$\bar{X}$	S.D.	Interpretation
1.Staff get appropriately dress	4.58	0.496	Highest
2.Staff polite speak and friendly	4.50	0.539	Highest
3.Staff have willing and standby to service with friendly smile	4.67	0.510	Highest
4.Staff have knowledge, expertise, laws and regulations of university and Ministry of finance	4.57	0.534	Highest
5.Staff have responsibility and commitment to work	4.56	0.535	Highest
6.Staff have work creatively	4.28	0.626	High
7.Staff can give consultant, guidance, and answer in doubt question	4.47	0.501	Highest
8.Staff can solve immediate problem in properly way	4.37	0.558	Highest
	4.34	0.598	Highest
9.Staff make good impress and understand to appeal client for come back to use service.	4.79	0.412	Highest
Overall			

Table I shows mean and standard deviation of the staff's satisfaction level the service process of supply inventory unit of Faculty of Science and Technology. It was found that the overall staff's satisfaction level for The Personnel is highest ($\bar{X}$=3.79, S.D.=0.412) When consider each item, it was found service process of supply inventory of Faculty of Science and Technology. is high for staff have idea ($\bar{X}$= 4.28 , S.D. = 0.626) The satisfaction level is highest is staff have willing and service smile fun friendly ($\bar{X}$=4.67,S.D.= 0.510) staff get dress in dress appropriately ($\bar{X}$= 4.58, S.D. = 0.496) staff have to knowledge , Expertise , Laws and regulations of University and Ministry of finance ($\bar{X}$= 4.57 , S.D. = 0.534) staff have responsibility and commitment to work ($\bar{X}$= 4.56,S.D. = 0.535) staff polite speak be submissive and friendly ($\bar{X}$= 4.50 , S.D. = 0.539) staff responsible and question ($\bar{X}$=4.47, S.D. = 0.626) staff can solve problem ($\bar{X}$=4.47 ,S.D. = 0.558) and staff impress and understand for recipient how to service ($\bar{X}$ (= 4.34 , S.D. = 0.598) respectively.

Table II. Mean and standard deviation of the staff's satisfaction level in the service process of supply inventory of faculty of science and technology process inventory

Process inventory	Satisfaction level		
	$\overline{X}$	S.D.	Interpretation
1.The process of service is appropriate and fast	4.30	0.647	Highest
2.The number of staff is sufficient for the service recipient	4.27	0.667	Highest
3.The service is accurate and no error	4.24	0.656	Highest
4.The number of staff is sufficient for the service recipient	4.20	0.665	High
5.Staff is ready and quick to service	4.35	0.674	Highest
6.Equipment is modern for serving	4.20	0.590	High
7. Service is following order.	4.33	0.510	Highest
8. Staff is working available during lunch break.	3.86	0.733	High
Overall	4.45	0.602	Highest

Table II shows mean and standard deviation of the staff's satisfaction level the service process of supply inventory unit of Faculty of Science and Technology. It was found that the overall staff's satisfaction level for The Process inventory is highest ($\overline{X}$= 4.45, S.D. = 0.602) When consider each item, it was found service process of supply inventory of Faculty of Science and Technology. is high for Modernization of equipment used to service ($\overline{X}$= 4.20 , S.D. = 0.590) The number of staff is sufficient for the service recipient ($\overline{X}$= 4.20 , S.D. = 0.665) and staff working to service in lunch break time ($\overline{X}$= 3.86 , S.D. = 0.733) The satisfaction level is highest is staff ready and quick to service ($\overline{X}$= 4.35 , S.D. = 0.674) The service is in the order before - after ($\overline{X}$= 4.33 , S.D. = 0.510) The process of service is appropriate and fast ($\overline{X}$= 4.30 , S.D. = 0.647) The number of staff is sufficient for the service recipient ($\overline{X}$= 4.27 , S.D. = 0.667) and The service is error – free and accurate ($\overline{X}$= 4.24 , S.D. = 0.656) respectively.

Table III. Mean and standard deviation of the staff's satisfaction level in the service process of supply inventory of faculty of science and technology place

Place	Satisfaction level		
	$\overline{X}$	S.D.	Interpretation
1.The contact area has the appropriate space	4.36	0.635	Highest
2.Clear Location signs and point service	4.31	0.782	Highest
3. Working place is clean and organized	4.47	0.604	Highest
4.Document Delivery is convenient	4.32	0.560	Highest
5.Have Seat for contactor	3.53	0.850	High
Overall	4.36	0.633	Highest

Table III shows mean and standard deviation of the staff's satisfaction level the service process of supply inventory unit of Faculty of Science and Technology. It was found that the overall staff's satisfaction level for The Place is highest ($\overline{X}$= 4.36, S.D.=0.633) When consider each item, it was found service process of supply inventory of Faculty of Science and Technology. is high for Seat for contact ($\overline{X}$= 3.53 , S.D. = 0.850) The satisfaction level is highest is Clean and orderly place to service ($\overline{X}$=4.47,S.D.= 0.604) The contact area has the appropriate space ($\overline{X}$= 4.36, S.D. = 0.635) Document Delivery is convenient ($\overline{X}$= 4.32 , S.D. = 0.560) and Location signs and point service ($\overline{X}$= 4.31,S.D. = 0.782) respectively.

Table IV. Mean and standard deviation of the staff's satisfaction level in the service process of supply inventory of faculty of science and technology by overall and individual aspects

The service process of supply inventory	Satisfaction level		
	$\bar{X}$	S.D.	Interpretation
1. Personnel	4.79	0.413	Highest
2. Process inventory	4.45	0.602	Highest
3. Place	4.36	0.633	Highest
Overall	4.74	0.555	Highest

Table IV show the mean and standard deviation of the staff's satisfaction level in the service process of supply inventory by overall and individual aspects of faculty of science and technology. It was found that the overall staff's satisfaction level in the service process of supply inventory by overall and individual aspects of the Faculty of Science and Technology is Highest ($\bar{X}$= 4.74, S.D.= 0.555) When consider each item, it was found that the staff's satisfaction level in the service process of supply inventory by overall and individual aspects of faculty of science and technology is highest level in Personnel ($\bar{X}$= 4.79, S.D.= 0.413) Process inventory ($\bar{X}$= 4.45, S.D.= 0.602) and the satisfaction level in Place is also in highest level ($\bar{X}$= 4.36, S.D.= 0.633) respectively.

Table V. Comparison of satisfaction levels in service process of supply inventory unit of faculty of science and technology Suan Sunandha Rajabhat University by gender

Service process of supply inventory	Gender	$\bar{X}$	S.D.	t	P-value
1. Personal	male	4.91	0.285	3.227[*]	.002
	female	4.61	0.665		
2. Process inventory	male	4.89	0.315	2.486[*]	.020
	female	4.70	0.460		
3. Place	male	4.61	0.934	2.538[*]	.013
	female	4.33	0.651		
Overall	male	3.220	0.525	3.099[*]	.002
	female	3.110	0.585		

*P < 0.05

Table v shows the comparison of satisfaction levels in service process of supply inventory unit of faculty of science and technology Suan Sunandha Rajabhat University by gender the independent t-test was used to analyze. It was found that the overall and each aspects such as personnel, Process inventory and Place were significant differences at .05 levels with p-value as .002, .020, .013 and .002 respectively.

Table VI. Comparison of satisfaction levels in service process of supply inventory unit of faculty of science and technology Suan Sunandha Rajabhat University by field of work

Service process of supply inventory	Field of work	X̄	S.D.	t	P-value
1. Personal	Academic section	4.71	0.533	-.558	.578
	Operation support	4.77	0.581		
2. Process inventory	Academic section	4.75	0.440	-1.025	.308
	Operation support	4.83	0.382		
3. Place	Academic section	4.83	0.564	-.857	.393
	Operation support	4.50	0.642		
Overall	Academic section	3.40	0.592	.446	.656
	Operation support	3.50	0.678		

Table VI shows the comparison of satisfaction levels in service process of supply inventory unit of faculty of science and technology Suan Sunandha Rajabhat University by field of work the independent t-test was used to analyze. It was found that the overall and each aspects such as personnel, Process inventory and Place were no significant differences at .05 levels with p-value as .578, .308, .393 and .656 respectively.

5. CONCLUSION AND FUTURE WORK

Based on the findings of this research researcher have brought important issues the results are as follows

1. From the discovery Satisfaction in the service process of supply inventory of Faculty of Science and Technology overall and individual was at the highest level. In addition, the consideration of aspects such as personnel (Staff have willing and standby to service with friendly smile, Staff get appropriately dress), Process inventory (Staff is ready and quick to service, Service is following order), and Place (Working place is clean and organized, the contact area has the appropriate space) were in high level that consistent with [5].

2. The findings of the comparison between staff's Satisfaction in the service process of supply inventory of Faculty of Science and Technology with gender, there are significantly at .05 level in overall and all aspects which consistent [6].

However, considering that the comparison between staff's Satisfaction in the service process of supply inventory of Faculty of Science and Technology with field of work, there are no difference significant at .05 level in overall and each aspect that are agreeable with [7].

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EFFECTS OF VIDEO ENHANCED-ACTIVITY SCHEDULES ON A NUMBER OF SCIENCE EXPERIMENTS IN STUDENTS WITH AUTISM

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ABSTRACT

Bu araştırmanın amacı; yedinci sınıf otizmli kaynaştırma öğrencilerine video destekli resimli etkinlik çizelgesi yöntemiyle bazı fen deneylerinin öğretiminin etkililiğini belirlemektir. Araştırmadaki bağımlı değişken, karışımların ayrılması ile ilgili bazı fen bilgisi deneylerinin öğretimidir. Araştırmanın bağımsız değişkeni ise; video model destekli resimli ekinlik çizelgesi ile öğretimdir. Bu araştırmada tek denekli araştırma yöntemlerinden katılımcılar arası yoklama evreli çoklu yoklama modeli kullanılmıştır. Araştırmada, tam zamanlı yedinci sınıfa devam eden otizm tanısı almış, üç kaynaştırma öğrencisi yer almıştır. Çalışmaya başlamadan önce her bir deneye ilişkin beceri analizi yapılmıştır. Daha sonra her bir deneyin beceri basamaklarına ilişkin video klipleri ve resimli etkinlik çizelgeleri hazırlanmıştır. Hazırlanan resimli etkinlik çizelgeleri powerpointin her bir slaytına yerleştirilmiş ve daha sonra her bir slayta o slaytta yer alan beceri basamağıyla ilişkili video klibi gömülmüştür. Dolayısıyla, fen bilgisi deneylerine ilişkin powerpoint kullanılarak oluşturulan video destekli resimli etkinlik çizelgesi materyali deneylerin öğretimi oturumlarında kullanılmıştır. Elde edilen bulgular, ASD'li öğrencilere karışımların ayrılması ile ilgili bazı fen deneylerinin öğretiminde video destekli resimli etkinlik çizelgesi yönteminin edinim, kalıcılık ve genellemede etkili olduğu belirlenmiştir.

VIEWS OF MOTHERS WHOSE CHILDREN NEED EARLY CHILDHOOD ERA SPECIAL EDUCATION ON THEIR CHILDREN'S SLEEP AND REST

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ABSTRACT

Basic needs should be resolved in order for a learning is realized. It is known that families of children with special educational needs experience difficulties at their children's transition to sleep, during sleep and quality of sleep. Besides these, it is observed that the children cannot experience the rest that may be provided by fully focusing on an object or an incident during the day. It is thought to increase children's unrest. Purpose of this study is to determine mothers' view, whose children are in early childhood and having education and consultancy service, on their children's rest and sleep during the day. Mothers who applied to consultancy centers in the borders of Istanbul during the 2016-2017 educational year constitute the research environment. Sampling of the study consists of four consultancy centers that admitted the study and fifty two mothers. Data has been collected by researchers via two open ended questions in order to find out the thoughts of mothers on rest during sleep. Findings include that the mothers do not think that their kids are not fully rested during their sleep, besides that a majority of mothers think their kids cannot rest by spending time on a thing or an incident during the day. They explain this by their kids' nervousness and focusing on things only for a short term. Findings of our study include that some mothers think their children rest in their sleep even if they still look sleepy.

LIES, DAMNED LIES AND CAPITALISM: HOW TO SURVIVE CHAOS AND ANARCHY

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The inevitable and unpalatable praxis of capitalist ideology, the disproportionate distribution of resources to benefit the rich, will invariably engender troublesome reactions by opposing classes; the ruling class as protagonists for capitalism and the emerging poorer class as its victims. The emasculation of formally middle class citizens of the North as they become the nouveau poor counterpoints against the market share achievable from the emerging middle class in the South will lead to troublesome conflagration. Governments will become the enforcers of the ruling class as they implement draconian and anti-democratic laws to control dissent. The masters homogenize culture with globalization as the clay that reconfigures the economic and the social. Fear is the oxygen that gives life to their terrorism. A confused electorate world-wide polarizes as political choice-points narrow with all politicians singing the same rightist rhetoric. Resources are running out; global warming is a reality not a theory; religious grandiloquence is fracturing civil society; wars are raging – yet the rich continue to get richer. Only the brave are prepared to speak of a new approach to resource management and civil governance that has at its core egalitarianism, fairness and equity – not money. Chaos and anarchy are the twins born of capitalism in decline. Reason and truth must be their custodians.

VEHICLE ROUTE PLANNING FOR MULTIPLE TARGETS IN ONLINE MAP FOR A PATIENT TRANSPROT VEHICLE

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ABSTRACT

Vehicle Routing Problem is an area which has attracted researcher's interest over the past 30 years. Particularly Vehicle Routing Problem with Time Windows is a special and well-known section of Vehicle Routing Problems. A large number of papers have been published with exact and heuristic methods of the vehicle routing problem with time windows. In this paper, we present a vehicle routing planning problem for multiple targets using an online vehicle routing planner on an online map. For this aim, a planner already existing in internet is applied. Patients from the hospitals at specific locations are transferred to other hospitals as soon as possible, by using an online vehicle routing planner on an online map. A company cannot gain an advantage at every area. If the company is incapable of performing a particular task, procuring it from another company which is able to execute preferable will be the right decision. Due to employing such online systems, enterprises can save their sources and time, by having a micro but lean structure; therefore companies can focus on the subjects they know better.

Keywords Vehicle Routing Problem, Vehicle Routing Problem with Time Windows, Patient Transfer

1 Introduction

Transportation is a critical field of human action. It strengthens and makes possible many other social and economic activities. Whenever we use a telephone, shop at a grocery, read letters or fly/travel by bus for business or pleasure, we benefit from some system that has routed messages, goods or people from one place to another. Vehicle Routing Problems are planning problems about optimum distribution and pick-up routes of the vehicles charged to serve to geographically scattered centers from one or more warehouse [1]. Vehicle Routing Problem (VRP) is introduced to literature with a research by Dantzig and Ramser at 1959 for the first time [2]. In this study, gasoline distribution to service stations problem as a real life application is addressed and a mathematical programming model and an algorithmic approach is presented. Afterwards, Clarke and Wrigt suggested a greedy heuristic algorithm which develops Dantzig-Ramser approach [3]. It is studied widely for the last 40 years. In vehicle routing problems every vehicle is taken into consideration as a route. Classical vehicle routing problems have some assumptions which are:

- Customer demands are known,
- Demands are met by only one warehouse,
- Distribution is applicable,
- Vehicles are homogeneous and waiting availably in the warehouse,
- Travel time between warehouse and customers are known and fixed,
- A vehicle services to only a customer,
- The beginning and ending nodes of vehicles are warehouse.

In the light of these assumptions, multiple objective functions are applicable at VRP's. Some of these are:

- Minimizing the total transportation costs related to vehicle's fixed costs, the total distance or travel time,
- Minimizing the total vehicle number in order to service all customers,
- Minimizing the penalties arising from distributing partial to customers.

Most vehicle routing problems have a combinatorial nature and different types according to the constraints they have and these are generally non-deterministic polynomial time (NP) hard problems [4]. The calculation effort needed to solve the problem increases exponentially together with the problem's size.

A typical VHP can be described as a weighted graph. Figure 1 shows an illustration of VRP, where the warehouse is symbolized as 0 and the customers are symbolized as 1 through 10. The solution involves three routes: 0-8-9-10-0, 0-3-4-6-0 and 0-2-1-5-7-0.

Figure 1
A typical vehicle routing problem (Adopted from [5])
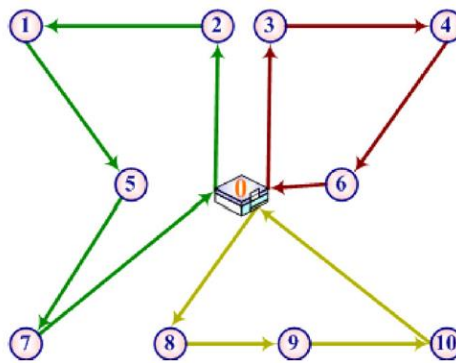
The solution of typical VRP is a set of routes that every route begins from the warehouse, ends at the warehouse and the constraint of visiting every customer only once is ensured. Besides this, sometimes adding certain side constraints according to the type of problem are required. Most common side-constraints are: capacity constraint, maximum demand point constraint at a route, total time constraint of a vehicle at a route, time-window constraint that service can start to demand points, priority constraints that a demand point should be visited before another demand point [6].

In compliance with these constraints and the application fields in life, VRP are classified into different ways. This classification is shown at Figure 2.

Figure 2
Detailed Classification of VRP
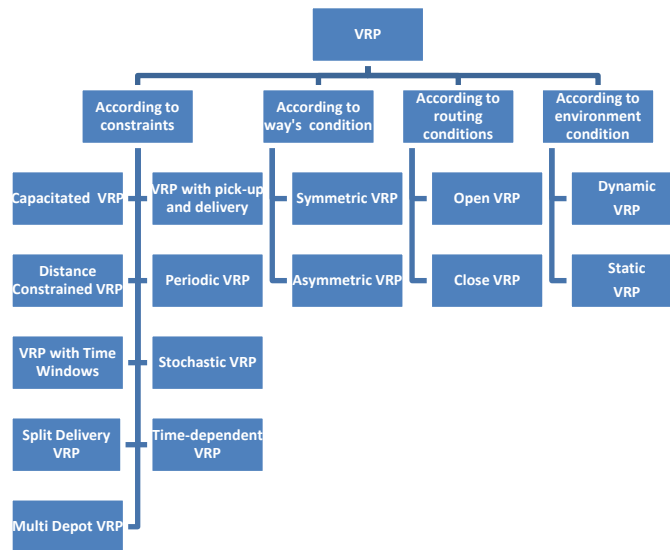
1.1. Vehicle Routing Problem According to Constraints

1.1.1. Capacitated Vehicle Routing Problem

This is the most common type of Vehicle Routing Problem. Every vehicle has a specified capacity and customer's demands are foreknown. Every vehicle's capacity is equal and vehicle's route start from the warehouse and return back to warehouse. The distances between warehouse and customers are symmetrical and vehicle's travel times can be directly proportional with this distance. General purpose of this VRP is minimizing the total covering distance of vehicles [7].

1.1.2. Distance Constrained Vehicle Routing Problem

In this problem, the distance constrain that each vehicle assigned to routes can move is take into consideration.
The difference between Capacitated VRP is that there is a specific total distance that every vehicle can cover [8].

1.1.3. Vehicle Routing Problem with Time Windows

If we add a time window to each customer, we obtain the vehicle routing problem with time windows. This problem contains the condition that the service at any customer starts within a specified time interval, namely, time window. There are two types of Vehicle Routing Problem with Time Windows (VRPTM): When they are regarded not-waiting for a penalty cost, they are "soft VRPTW"; when they cannot be violated, the vehicles have to wait and they are "hard VRPTW" [9]. VRPTW is a part of NP-hard combinatorial optimization problems class [4]. Bank and postal deliveries, industrial waste collection, school bus routing and scheduling are some important VRPTW applications met in daily life.

1.1.4. Vehicle Routing Problem with Pick-up and Delivery

This problem is defined as picking up from facilities to customers and delivering from customers to facilities are carried out by same vehicles. It is common at health system (picking up bloods from centers to hospitals and meanwhile bringing new bloods to centers from blood collection sites), automotive industry (sending used parts back to factories for recycling during the distribution of spare parts to local dealers) and

food sector (collecting expired and spoilt foods in the course of daily fresh product's distribution to markets) [10].

1.1.5. Periodic Vehicle Routing Problem

In periodic vehicle routing problem, plan of a particular term is planned first and customers are serviced within this process. Service number to customers changes according to the demand amount of customers, storage yards. This problem class occurs at fields such as groceries, beverage industry and waste collection [11].

1.1.6 Split Delivery Vehicle Routing Problem

In this type of VRP, a customer's demand can be obtained from more than one vehicle; in other words different vehicles can drop by to a customer more than one. By this way, a customer's demand can be split between several vehicles on various routes. Hence, the cost of a solution can be decreased up to %50 [12].

1.1.7 Stochastic Vehicle Routing Problem

One or some problem elements are random in this type of vehicle routing problem. Therefore, it is called stochastic vehicle routing problem. Either customers, demands or times can be stochastic.

1.1.8 Multi Depot Vehicle Routing Problem

At Multi Depot Vehicle Routing Problems, there are more than one depots/warehouses for vehicles to start moving. In this problem type, the location of depots and customers are foreknown; each depot has a capacity to meet all customers' total demands. Every vehicle has to return back to the beginning depot.

1.1.9 Time Dependent Vehicle Routing Problem

At Multi Depot Vehicle Routing Problems, there are more than one depots/warehouses for vehicles to start their routes. In this problem type, the location of depots and customers are foreknown; each depot has a capacity to meet all customers' total demands. Every vehicle has to return back to the beginning depot.

1.2. Vehicle Routing Problem According to Way's Conditions

1.2.1. Symmetric Vehicle Routing Problem

In Symmetric Vehicle Routing Problem, the going and return distances are equal.

1.2.2. Asymmetric Vehicle Routing Problem

If the going and return distances are not equal, these problems are called Asymmetric Vehicle Routing Problem. This inequality brings into prominence the subject that which customer vehicles should drop first; and hence this determines the vehicle's route and the calculation of route distance.

1.3. Vehicle Routing Problem According to Routing Conditions

1.3.1. Open Vehicle Routing Problem

A vehicle does not return to the warehouse/depot after servicing the last customer on a route in the Open Vehicle Routing Problem. The objective is finding the minimum number of vehicles required to service all of the customers [13].

1.3.2. Close Vehicle Routing Problem

In Close Vehicle Routing Problem, each route starts and ends at the same unit. Solution to this type of problem includes determining the minimum travel time and total distance of the routes.

1.4. Vehicle Routing Problem According to Environment Conditions

1.4.1. Dynamic Vehicle Routing Problem

Dynamic Vehicle Routing Problem contains dynamic vehicle routes and dynamic vehicle scheduling. Travelling Repairmen is the most common researched issue of dynamic vehicle routing problem.

1.4.2. Static Vehicle Routing Problem

The whole information about routes to be planned is known before the routing process begins in Static Vehicle Routing Problem; and it has conditions that data associated to routing cannot be changed after routes are generated [14].

In the light of these data, we proposed to transfer the patients from the hospitals at specific locations to other hospitals as soon as possible, by using an online vehicle routing planner on an online map (for example google maps) within this study. Therefore, a planner existing in internet is utilized for this aim.

The remainder of this paper is organized as follows: Section 2 presents more specific information and literature review about VRPTW as the online vehicle routing planner employed in the study is an instance of VRPTW. Section 3 provides the results of the study and concludes this paper with final remarks.

2 Material and Methods

Vehicle routing problem with time windows is a specific area of classical VRP and constitutes the most significant class of VRP in which goods and people have to be transferred between source or target points [15]. Even if a vehicle is reached to customer before the time windows opens, it cannot serve to customer until the time window is opened. Furthermore, reaching to the customer after the time window has closed is unallowable. This problem can be solved with exact methods such as Lagrange Relaxation –Based methods [16], Column Generation [17,18] and Dynamic Programming [19,20]. However, as these approaches occasionally remain incapable to solve this combinatorial problem and requires a largely amount of time; researchers utilize meta-heuristic approaches for analyses. Simulated Annealing [21,22,23], Genetic Algorithms [24,25,26,27,28], Tabu Search [29, 30,31,32,33] and Ant Colony Optimization [34,35,36] are the most common meta-heuristic methods applied in literature.

In this study, we utilized *routexl* online system for transferring patients from particular locations to hospitals. The case study involves 15 hospitals (service points) and the location (coordinates) of these hospitals is given at Table 1.

Table 1
Hospitalˌs Names, Locations and Coordinates

Location Number	Location / Name of Hospital	Coordinates
1	Acibadem Hosp.	(41.0187984, 29.045487800000046)
2	Valide Bag Hosp.	(41.0116567, 29.04081510000003)
3	Medipol Hosp.	(41.0046715, 29.034155800000008)
4	Numune Hosp.	(41.0052728, 29.021723399999928)
5	Siyamiersek Hosp.	(41.0039995, 29.024118999999928)
6	Abdulhamit Hosp.	(41.0010225, 29.02131350000002)
7	Yunus Emre Hosp.	(41.0230524, 29.01724349999995)
8	Uskudar Hosp.	(41.0259872, 29.021816299999955)
9	Mihrimah Slt. Hosp.	(41.02730469999, 29.01658829967)
10	Zeynep Kamil Hosp.	(41.0157441, 29.026927200000046)
11	Academic Hosp.	(41.0198389, 29.034315300000003)
12	Capitol Hosp.	(41.0214304, 29.039567799999986)
13	Baskent Hosp. 1	(41.0239617, 29.040625500000033)
14	Baskent Hosp. 2	(41.0247587, 29.04126969999993)
15	Uskudar State Hosp.	(41.0156245, 29.038421599999992)

We utilized three different route scenarios with the aim of finding the shortest route at every scenario. Furthermore, every route has options such as having one vehicle, two vehicle or three vehicle. The characteristics of every route are as follows:

Route 1: Service starts at 13.00 and there is a five minute distance between all locations.

Route 2: Service starts at 13.00; there is a five minute distance between all locations and the vehicle has to arrive to 12th location at 13.15.

Route 3: Service starts at 13.00; there is a five minute distance between all locations; the vehicle has to arrive to 12th location at 13.15; and 7th location must visited before 12th location, 4th location must visited after 12th location.

We obtained three different shortest routes for every scenario. Scenario 1, Scenario 2 and Scenario 3 routes are presented at Figure 3, 4 and 5 respectively.

Original travel time is 0,43 hours with 19,6 km distance for Scenario 1 with one vehicle. All results are based on average fuel consumption 15 km/l, fuel price 1,5\$/l and CO_2 2,2 kg/l. Optimal travel time is 0,40 hours and 17,7 km distance. 0,03 hours (8,6%), 1,9 km (9,4%), 0,1 l fuel (9,4%), 0,19\$ (9,4%) and 0,3 kg CO_2 (9,4%) are saved within Scenario 1 with one vehicle. However, original travel time is 0,24 hours with 17,7 km distance for Scenario 1 with two vehicle. Optimal travel time is 0,27 hours and 20,6 km distance. 1,56 hours (13,2%), 2,8 km (15,8%), 0,2 l fuel (15,8%), 0,30\$ (15,8%) and 0,4 kg CO_2 (15,8%) are lost within Scenario 1 with two vehicle. Besides, original travel time is 0,26 hours with 19,8 km distance for Scenario 1 with three vehicle. Optimal travel time is 0,32 hours and 24,6 km distance. 1,53 hours (23,9%), 4,8 km (24,5%), 0,3 l fuel (24,5%), 0,52\$ (24,5%) and 0,7 kg CO_2 (24,5%) are saved within Scenario 1 with three vehicle.

Figure 3
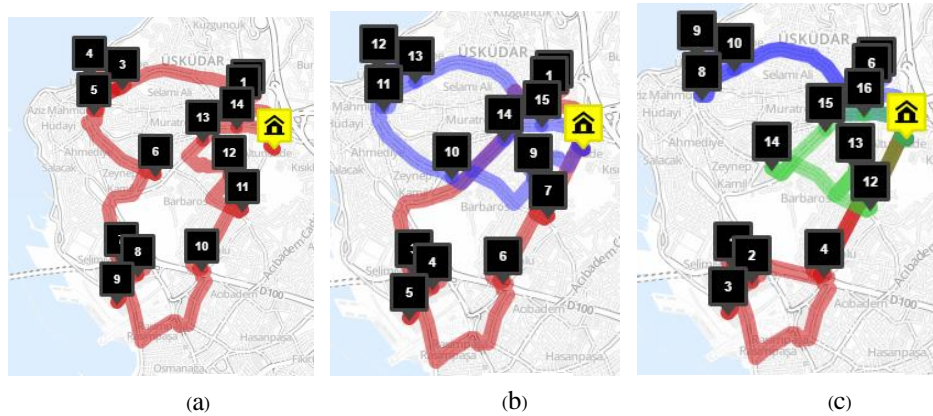**Vehicle Routes for Scenario 1 with one vehicle (a), two vehicle (b) and three vehicle (c)**

(a)   (b)   (c)

Figure 4
Vehicle Routes for Scenario 2 with one vehicle (a), two vehicle (b) and three vehicle (c)
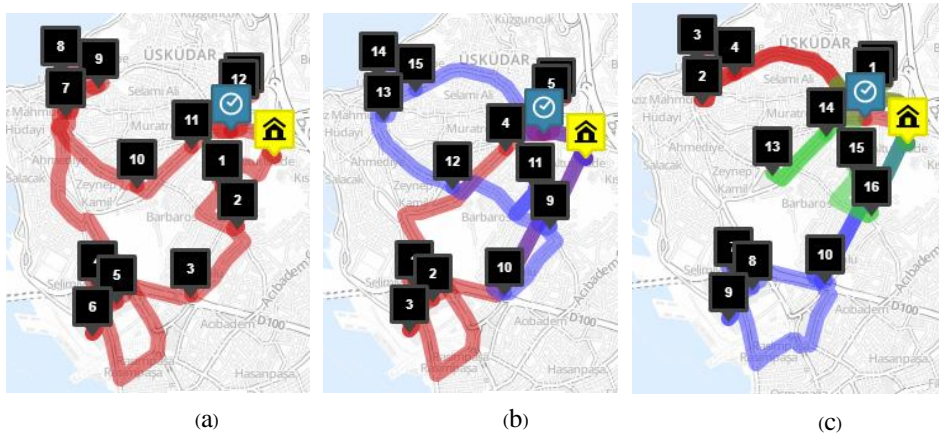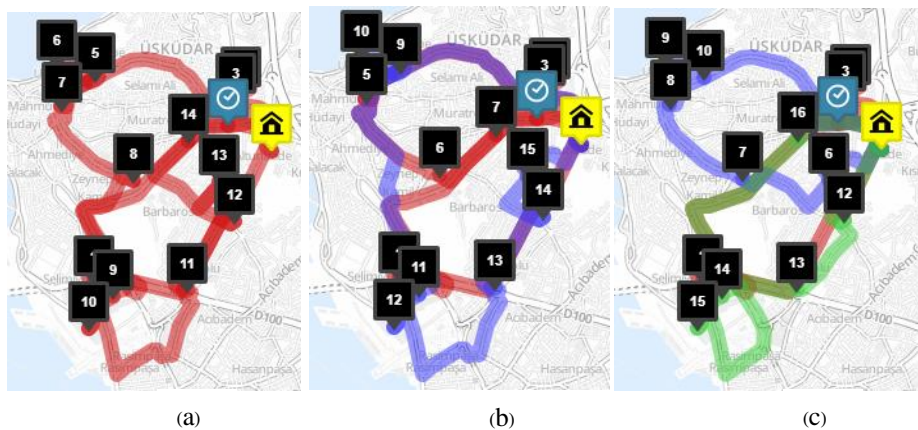

(a)   (b)   (c)

Figure 5
Vehicle Routes for Scenario 3 with one vehicle (a), two vehicle (b) and three vehicle (c)

(a)   (b)   (c)

3 Results and Discussion

It is not necessary for a hospital to take the burden of vehicle routing for patient transfers. In this study, we utilized an online program to transfer patients from specific locations to other hospitals as soon as possible. We implemented 3 different scenario containing one vehicle, two vehicle or three vehicle conditions; and obtained 9 different shortest routes. In addition to these, online program gives valuable

information about how much time, fuel, cost and CO_2 saved or lost. Programs such as the one utilized in this study include intense mathematical operations; at the same time these can be implemented for similar purposes. This will enable the hospital or company focusing on their own activities. Thereby, fixed costs will turn into changing costs, by decreasing costs; quality, productivity, customer satisfaction and profits will improve.

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A COMBINED MULTI CRITERIA DECISION MAKING METHOD FOR ERP PROJECT MANAGER SELECTION

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ABSTRACT

It's getting harder to carry out rapidly developing ERP projects in recent conditions. Therefore, deciding who should be responsible for these projects is becoming a more important issue for the managers since they are high cost, time-consuming and process focused. In this study, Fuzzy Cognitive Maps (FCM), Delphi method and multi-criteria decision-making method PROMETHEE are used in order to select appropriate ERP project managers. There are several papers handling similar problems in literature, but it is the first to use FCM, Delphi method and PROMETHEE altogether. Combined trio method is found to be an efficient decision aid in ERP manager selection. Selection of an appropriate project manager for high-cost ERP project implementations has a distinct importance besides ERP system setup in business. Hence, a combined multi-criteria decision-making method is presented in order to select the most appropriate ERP project managers.

Key words: ERP project manager selection, Fuzzy cognitive mapping, Delphi method, PROMETHEE.

I. INTRODUCTION

Enterprise Resource Planning (ERP) is the most important and popular system that have been developed to keep the information in an efficient way. ERP is both a planning and an operating system that stands with information management and integrates all departments of a company. It's more secure to reach information within a company with ERP systems (Kao and Hsu, 2011). Companies need ERP systems to increase the transactions between the employees, to direct them for new targets, to view the current situation, to prepare effective reports and to grow faster. In addition, companies use ERP systems to be successful in rivalry conditions, to predict the changing business requirements and to response customers quickly. Companies also need ERP project managers who have gained expertise in their fields (López and Salmeron, 2014a; López and Salmeron, 2014b).

ERP project managers should prepare the project plans, manage the project team and execute the ERP system with respect to the performance criteria of the company. In this sense ERP project managers must be supported by senior management. The most important attributes which a project manager must have are experience, communication, modeling and risk management skills. They should easily adapt to changing conditions. ERP project manager is the person who is in charge of warning the senior management in case of a possible risk. They must make decisions according to flexible and precise rules.

In this study, a methodology to evaluate and choose the most appropriate ERP project manager for high-cost and time-consuming ERP projects is presented. The FCM, Delphi and PROMETHEE methods used in this paper are introduced in the following section. In third section the proposed integrated methodology is presented. And finally, a numerical application is conducted to show the applicability and efficiency of the proposed methodology. Evaluation criteria and comparison weights are determined by combining both FCM and Delphi method. Then, with respect to the comparison weights appropriate project manager alternative is selected with PROMETHEE final ranking.

II. METHODOLOGY

FCM, Delphi and PROMETHEE methods are used for the proposed model within the study of ERP project manager selection. By the aid of visuality of the FCM, initially criteria are determined then weighted by Delphi method and final selection is completed by PROMETHEE method. The methodologies and related literature for each are viewed below.

2.1. Fuzzy Cognitive Mapping (FCM)

Cognitive Mapping (CM) is a modeling system which enables to study on the opinions, values, trends and the correlation between these. CM is an effective technique as it reflects the subjective opinions and as it doesn't restrict the interview with the related questions. CM, which is a more effective technique than others with its clearness and transparency, provides an easy study environment for the interviewee with its active drawings. Also, it helps to collect data by establishing cause-effect connections that provide totalitarian comparisons on the subject. The period which has been detected during the interviews is an indirect method rather than a text analysis or written document. Even normal or fuzzy, there are causal relation types in CM. The main difference between CMs and FCMs is the use of linguistic variables to define causality between objects (Zarandi et al. 2012).

The history of Fuzzy Cognitive Mapping (FCM), which is a type of CM and used for the ERP project manager selection, depends on Euler's graphics theory. FCM defines behavior of a system with conception variables and relations between these. A simple FCM sample is shown in Figure 1 (Yaman and Polat 2007). C_i is a concept with a state value. The state value can be a fuzzy value within $[0,1]$ that represents the degree of a concept, or a bivalent logic in $\{0,1\}$ that represents a concept's open or closed state. The weight W_{ij} of an arrow indicates the influence degree from the cause concept C_i to effect concept C_j, which can be a fuzzy value within $[-1,1]$ or a trivalent logic within $\{-1, 0, 1\}$. There are three possible types of causal relationships between concepts (Yaman and Polat 2009):

- $W_{ij} > 0$ indicates positive causality between concepts C_i and C_j. That is, an increase (decrease) in the value of C_i leads to an increase (decrease) in the value of C_j.
- $W_{ij} < 0$ indicates negative causality between concepts C_i and C_j. That is, an increase (decrease) in the value of C_i leads to a decrease (increase) in the value of C_j.
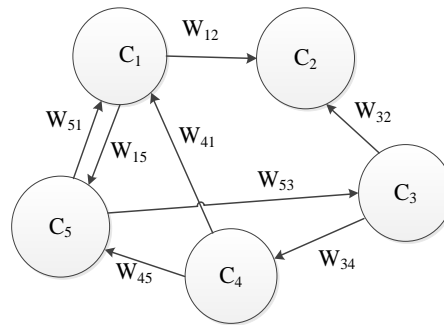- $W_{ij} = 0$ indicates no relationship between C_i and C_j.

Figure 1: A basic FCM representation

Cognitive models are the complex systems and they consist of different variables. In FCM method the increase in numbers of variables of the drawn maps raises the complexity of maps at the same rate. FCMs have been used in a wide application area such as engineering, strategic planning, information technology, medicine, environment, project management, investment analysis and decision-making (Yaman and Polat, 2009).

Ravasan and Mansouri (2014) study on failure factors in ERP implementation projects by using FCMs. Gerogiannis et al. (2014) use FCMs to determine critical success factors of online music streaming services. In the study, they aim to obtain the relationships between them and know at what level the CSFs influence the business overall success. Ahmadi et al. (2014) develop a new approach for assessing the ERP readiness in organization by considering casual relationships between influential factors using FCM and fuzzy analytic hierarchy process (FAHP). Kardaras et al. (2013a) apply FCMs and Delphi method in hotel services dynamic pricing. Karkadas et al. (2013b) apply Fuzzy Delphi Method (FDM) and FCMs to highlight the services features that are most preferred by the customer and to adapt presentation media and layout. The integrated approach deals with the subjectivity inherent in web design choices and in customers' perception of services priorities. Salmeron and Lopez (2012) propose a FCM based model to forecast ERP maintenance risks. They aim to help professionals manage their ERP maintenance projects by the study. Büyüközkan and Vardaloğlu (2012) determine the factors that will support better implementation of collaborative planning, forecasting and replenishment (CPFR) strategy in retail industry and analyze them using FCM approach. Salmeron and Papageorgiou (2012) implement Grey Systems and FCMs in medical decision-making problem pertaining to the problem of radiotherapy treatment planning selection. Ozdagoglu (2010) uses cognitive maps in his study for the purpose of determining the relations between the main components that affect the product at a frozen food manufacturing company and with the aim of these maps the structure of ANP is generated. Salmeron (2009) proposes a means of building and using fuzzy cognitive maps to support the managers as well as analysts of Research and Development (R&D) portfolios by making prediction comparisons between the research projects under evaluation. Irani et al. (2009) attempt to address a relative void in the literature, aiming to demonstrate the inter-locking factors within an enterprise information system that relate knowledge management and organizational learning, via a model that highlights key factors within such an inter-relationship. This is achieved by extrapolating data from a manufacturing organization using a case study, with these data then modeled using FCM. Bueno and Salmeron (2008) use FCMs for the selection of ERP software selection. Stylios et al. (2008) handle decision support systems as FCM structure on medical area. Also, Kim et al. (2007) handle the RFID usage by FCMs on supply chain. Rodriguez-Repiso et al. (2007) overcome several limitations used for identifying, classifying and evaluating the indicators of success in Information Technology (IT) projects with FCM methodology. Johnson and Lipp (2007) propose the cognitive mapping process to identify and merge the individual goals of faculty members in a large academic department as a first step of creating a strategic plan. Yaman and Polat (2007) study the modeling of

Effect Based Operations (EBO) with simulation and FCM. Similarly, Bertolini (2007) benefits from the FCM approach in an article of person reliability factors. Sharif and Irani (2006) present FCM simulations as a means to model tangible/intangible aspects of the Information System Evaluation (ISE) decision-making task. Konar and Chakraborty (2005) study FCMs with an inexperienced learning approach and causality. Kang et al. (2004) propose the usage of FCM for the management of relationships among organizational members in airline service.

2.2. Delphi method

Delphi is a systematic and interactive method based on a group of independent experts. The Delphi method collects and analyzes the data of experts that share knowledge skills, expertise and opinions until a mutual consensus is achieved (Hartman 1981; Chang et al. 2007; Taskin Gumus 2009; Bilişik et al. 2013). At the first step of the Delphi the experts are selected. At the second, third and forth step, the first, second and third round of a questionnaire survey is conducted. At the last step, expert opinions are integrated and a consensus is obtained. Third and forth steps are normally repeated until a consensus is reached on a particular topic (Taskin Gumus 2009). Buyukozkan and Ruan (2008) present fuzzy weighted Delphi and VIKOR method for measuring the performance of enterprise resource planning (ERP) software products. The consensus weights of criteria identify through the fuzzy Delphi methodology. The final ranking of the ERP is determined via VIKOR. Chan et al. (2001) present an application of Delphi method in selection of procurement systems for construction projects. Buyukozkan et al. (2004) use Delphi technique to identify the importance weights of software quality criteria and attributes. Wu et al. (2009) present ANP whose criteria are gathered from experts by using Delphi method and mixed integer programming (MIP) to optimize the selection of supplier. Yang and Hsieh (2009) present a Delphi fuzzy multiple criteria decision-making method for six-sigma project selection.

2.3. PROMETHEE

Brans and Vincke (1985) and Brans et al. (1986) propose an outranking method called PROMETHEE. It has been stated that PROMETHEE is a quite simple ranking method in conception and application compared with other methods used for multi-criteria analysis Gelderman et al. (2000). It is well adapted to the problems where a finite set of alternatives are to be ranked according to several conflicting criteria (Gelderman et al. 2000; Dagdeviren 2008; Yilmaz and Dagdeviren 2011).

Behzadian et al. (2010) presents a classification scheme and a comprehensive literature review is presented in order to uncover, classify, and interpret the current research on PROMETHEE methodologies and applications. Athawale et al. (2012) applies PROMETHEE II for facility location selection. Gul et al. (2012) use PROMETHEE method with integrated fuzzy AHP and VIKOR methods in scenario selection of an emergency department simulation study. Vetschera and Almeida (2012) present a PROMETHEE-based approach to portfolio selection problems. Yilmaz and Dagdeviren (2011) present a combined fuzzy PROMETHEE method and zero-one goal programming for equipment selection. Chen et al. (2011) proposed fuzzy PROMETHEE for system information outsourcing. Ishizaka and Nemery (2011) select the best statistical distribution with PROMETHEE and GAIA. Taha and Rostam (2011) present a hybrid fuzzy AHP-PROMETHEE decision support system for machine tool selection in flexible manufacturing cell. Tuzkaya et al. (2010) presents fuzzy PROMETHEE for material handling equipment selection problem. In the recent literature PROMETHEE is widely used in the domain of supplier selection (Senvar et al. 2014), warehouse storage location assignment (Fontana et al. 2014), urban ecotourism site selection (Kaya et al. 2013), plant location selection (Mousavi et al. 2013), water resource management (Nasiri et al. 2013) and so on (Amaral

and Costa, 2014; Vinodth et al. 2014; Govindan et al. 2014; Kabir and Sumi, 2014). The basic steps of the PROMETHEE method can be outlined as in details below with seven steps:

Step 1: The data matrix is created as seen on Table 1. A=(a,b,c...), w=(w$_1$,w$_2$,...w$_k$), c=(f$_1$, f$_2$,...f$_k$) refer to the alternatives, weights and criteria respectively.

Table 1: Data matrix

	a	b	c
	$f_1(a)$	$f_1(b)$	$f_1(c$
	$f_2(a)$	$f_2(b)$	$f_2(c$
	...	...	...
	$f_k(a)$	$f_k(b)$	

Step 2: Preference functions are defined for the criteria. Six different preference functions used for the application of integrated method is shown on Figure 2.

Step 3: Generalized preference functions are defined for alternative couples by considering the preference functions as basis. Generalized preference functions for a and b alternatives are defined as Eq. (2).

$$P(a,b) = \begin{cases} 0 & , f(a) \leq f(b) \\ p[f(a) - f(b)] & , f(a) > f(b) \end{cases} \quad (2)$$

Step 4: In way of moderate preference functions, preference index is calculated for each alternative couples Eq. (3).

$$\pi(a,b) = \frac{\sum_{i=1}^{k} w_i \times P_i(a,b)}{\sum_{i=1}^{k} w_i} \quad (3)$$

Step 5: As a measure of the strength and weakness of the alternatives, the leaving flow and the entering flow can be calculated by:

$$\Phi^+(a) = \sum \pi(a,x) \qquad x = (b,c,d,...) \quad (4)$$

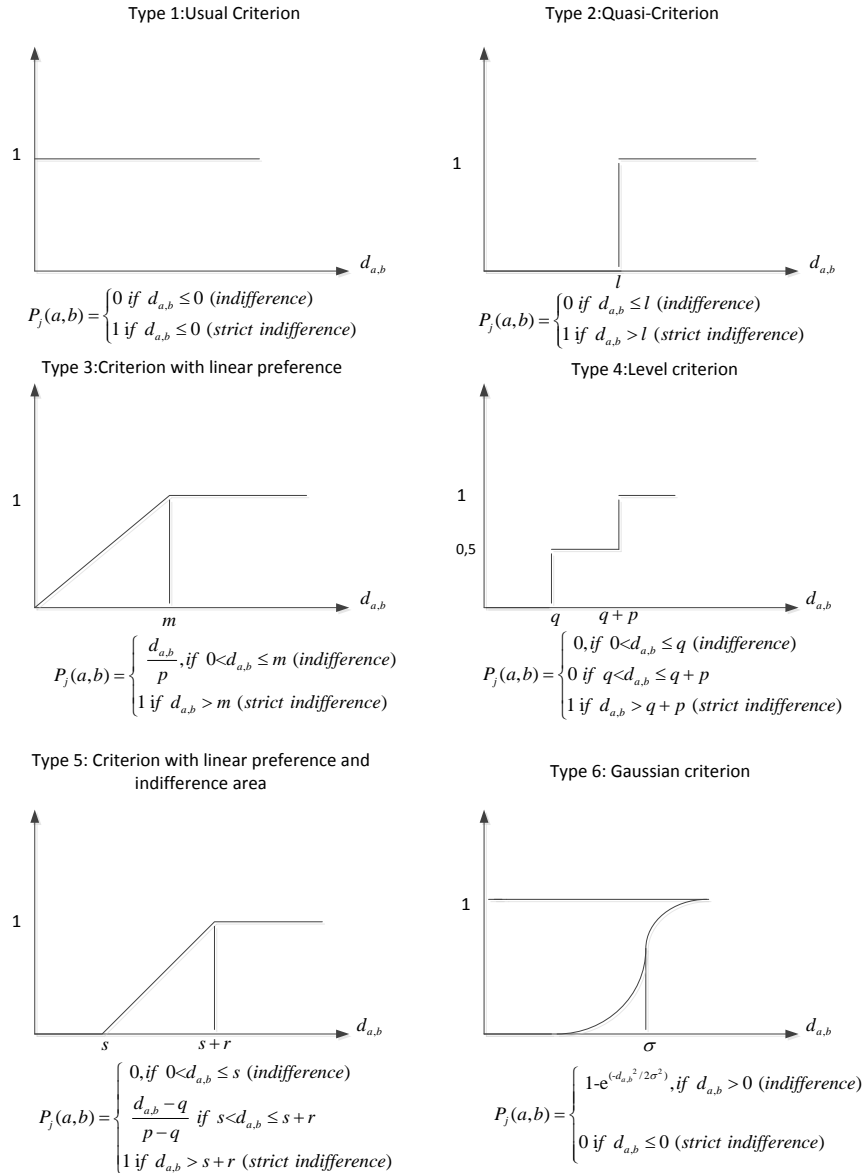$$\Phi^-(a) = \sum \pi(x,a) \qquad x = (b,c,d,...) \quad (5)$$

Type 1: Usual Criterion

$$P_j(a,b) = \begin{cases} 0 \text{ if } d_{a,b} \leq 0 \ (indifference) \\ 1 \text{ if } d_{a,b} \leq 0 \ (strict\ indifference) \end{cases}$$

Type 2: Quasi-Criterion

$$P_j(a,b) = \begin{cases} 0 \text{ if } d_{a,b} \leq l \ (indifference) \\ 1 \text{ if } d_{a,b} > l \ (strict\ indifference) \end{cases}$$

Type 3: Criterion with linear preference

$$P_j(a,b) = \begin{cases} \dfrac{d_{a,b}}{p}, if \ 0 < d_{a,b} \leq m \ (indifference) \\ 1 \text{ if } d_{a,b} > m \ (strict\ indifference) \end{cases}$$

Type 4: Level criterion

$$P_j(a,b) = \begin{cases} 0, if \ 0 < d_{a,b} \leq q \ (indifference) \\ 0 \text{ if } q < d_{a,b} \leq q + p \\ 1 \text{ if } d_{a,b} > q + p \ (strict\ indifference) \end{cases}$$

Type 5: Criterion with linear preference and indifference area

$$P_j(a,b) = \begin{cases} 0, if \ 0 < d_{a,b} \leq s \ (indifference) \\ \dfrac{d_{a,b} - q}{p - q} \ if \ s < d_{a,b} \leq s + r \\ 1 \text{ if } d_{a,b} > s + r \ (strict\ indifference) \end{cases}$$

Type 6: Gaussian criterion

$$P_j(a,b) = \begin{cases} 1 - e^{(d_{a,b}^2 / 2\sigma^2)}, if \ d_{a,b} > 0 \ (indifference) \\ 0 \text{ if } d_{a,b} \leq 0 \ (strict\ indifference) \end{cases}$$

Figure 2: PROMETHEE generalized preference functions

Step 6: Partial priorities are determined with PROMETHEE I. Partial priorities provide to determine the preference of alternatives with each other and to determine if the alternatives have any difference and the alternatives that are not able to be compared. The conditions below could be thought for alternatives a and b in order to determine the partial priorities.

➢ If any of the condition below is provided, alternative a is preferred to alternative b.

$$\Phi^+(a) > \Phi^+(b) \quad ve \quad \Phi^-(a) < \Phi^-(b) \tag{6}$$

$$\Phi^+(a) > \Phi^+(b) \quad ve \quad \Phi^-(a) = \Phi^-(b) \tag{7}$$

$$\Phi^+(a) = \Phi^+(b) \quad ve \quad \Phi^-(a) < \Phi^-(b) \tag{8}$$

➢ If any of the condition below is provided, a and b alternatives have no difference.

$$\Phi^{+}(a) = \Phi^{+}(b) \quad ve \quad \Phi^{-}(a) = \Phi^{-}(b) \quad (9)$$

> If any of the condition below is provided, alternative a couldn't be compared to alternative b.

$$\Phi^{+}(a) > \Phi^{+}(b) \quad ve \quad \Phi^{-}(a) > \Phi^{-}(b) \quad (10)$$

$$\Phi^{+}(a) < \Phi^{+}(b) \quad ve \quad \Phi^{-}(a) < \Phi^{-}(b) \quad (11)$$

Step 7: Complete priorities for alternatives are calculated with PROMETHEE II (Eq.12). Complete ranking is determined by evaluating all complete priority values and all alternatives on the same plan.

$$\Phi(a) = \Phi^{+}(a) - \Phi^{-}(a) \quad (12)$$

According to complete priority value that has been calculated for two alternatives a and b decisions below are made.

> If ... , alternative a is prior,

If..., a and b alternatives have no difference.

III. THE PROPOSED INTEGRATED METHODOLOGY

In order to mention the most effective ranking of ERP project alternatives and the process for the selection of ERP project manager is defined below as shown in Figure 3.

Step 1: The criteria are defined with FCM and Delphi method. At this step, first specialists have completed first step survey of Delphi. A FCM has been created with the results and the specialists are asked if they will make differences on this map or not. This FCM reaches its absolute form by a meeting with specialists. The criteria are determined as a result of this meeting.

Step 2: The criteria weights are defined by FCM and Delphi method. The criteria defined with FCM and Delphi method are weighted with second step surveys by both FCM and Delphi method. As a result of this weighting, it is decided to use the criteria weights obtained from Delphi method instead of the weights from FCM. The values of +0.25, +0.5 and +1.00 (in other mean +less, +medium, +more) are given to FCM criteria. However, in Delphi method, it's given more sensitive values 1 to 7 to the criteria. With its visual functions FCM helps specialists to decide easily and provides individuals to see the transactions between criteria. As there's no visuality at Delphi method, it's not as clear as FCM but Delphi method enables more sensitive results in mean of criteria medians and weights. The survey completed by specialists on Delphi method is simple and clear.

Step 3: The criteria is defined with the interviews implemented by specialists. The alternatives are introduced by the specialists according to the limits of PROMETHEE ranking method.

Step 4: Each of the preference functions for each criterion in PROMETHEE ranking method are defined. There have been defined six different preference functions for the application of method (Figure 2).

Step 5: The alternatives are scored by specialists with PROMETHEE ranking method. After defining preference functions specialists score each alternative according to the criteria.

Step 6: The criteria obtained from FCM and Delphi method, criteria weights, alternatives and preference functions data are manually entered into a new Promethee-Gaia software called Visual Promethee which is developed by Bertrand Mareschal at ULB (Université libre de Bruxelles). The results are evaluated at this step. After the evaluation, it is decided to use Delphi method during evaluation of the criteria weights.

Step 7: The results of PROMETHEE ranking method are evaluated with Visual Promethee. At last step the results obtained from Visual Promethee software are reviewed and the most suitable alternative is selected.
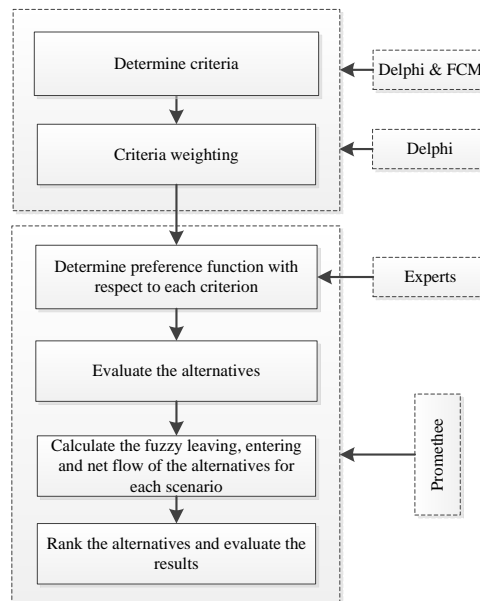

Figure 3: ERP project manager selection process

IV. A REAL-LIFE APPLICATION

In this paper, the most appropriate ERP project manager is selected for high-cost ERP projects. As ERP projects are high-cost and time-consuming, their managers should be selected considering several important criteria and details. This selection process should be fulfilled by ranks of specialists. At this point, the most appropriate ERP project manager is selected according to the suggested method. ERP project manager selection has been analyzed for a Turkish company which proceeds with the ERP projects and has an experience of 10 years on ERP projects. This company manages a number of ERP projects between 5 and 10 per year. The surveys introduced alternatives and organized meetings have been brought up by the employee of this company. The most suitable project manager selected will be assigned to a newly bought ERP project. This assignment will be completed by gathering MCDM techniques to have the most efficient result.

Step 1: This step consists of criterion definition by FCM and Delphi method. FCM introduces an approach by ending the transactions between individuals and prevents the opinions that help to create relations. Moreover, Delphi technique provides a criteria pool enabling to score the opinions obtained from surveys of specialists. The combination of FCM and Delphi method is shown in details in Figure 4.

FCM method is chosen as the first step of ERP project manager selection and it enables to get the opinions of different individuals. However, before the application of FCM, a survey of Delphi technique's first step is given to the specialists as it needs to have been considered to which properties an ERP project manager should have. Delphi technique's first step survey is applied to a group of specialists that consists of three mid-level managers, one senior manager and one junior manager. As a result, a FC map with the criteria, sub-criteria, previous information and first step surveys is created without proceeding with the second step of Delphi technique and sharing FCM with the company's specialists. At the first step of FCM, variables and relations are determined. Each relation gets their values of (-more, -middle, -less, zero, +less, +middle, +more) between [-1,1] distance in order to calculate the level effect of each variable. These values generate the basic mental of FCM. The created FCM is shown in Figure 5. Values between variables are also shown on this map. At the next step, the specialists are asked to make differences on FC Map. The aim here is to empower the specialists to re-comment by combining the opinions suggested with Delphi technique. A

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visual perspective has been gained to the criteria using FCM. FC map samples received from specialists are handled initially and then after a meeting with these specialists it's decided how this FC Maps should be completed. The last form of FC Map is shown in Figure 6.
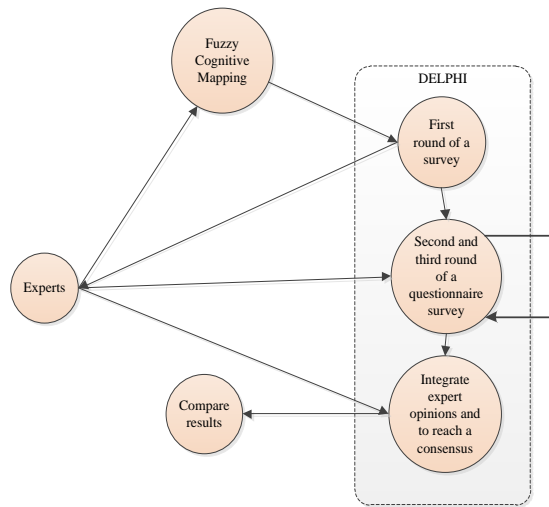

Figure 4: Research approach (adapted from Bueno and Salmeron, 2008)

Step 2: The criteria weights are defined by FCM and Delphi method in this step. The last formed FC Map has been scored by the specialists and the weights of the scores and medians are calculated. The results of the criteria weights are shown in Table 2. A Delphi second step survey has been given to specialists to compare the criteria weights of FCM with Delphi technique (Table 3). For this step, the specialists scored the defined criteria.
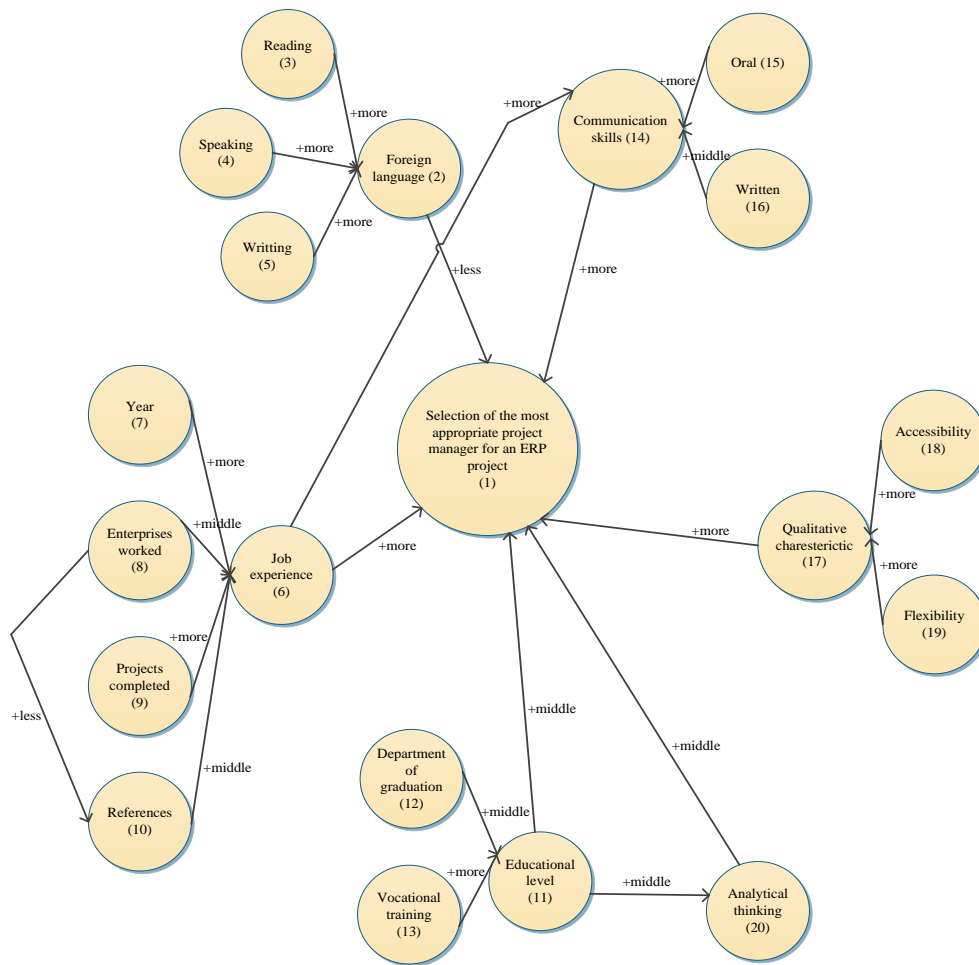
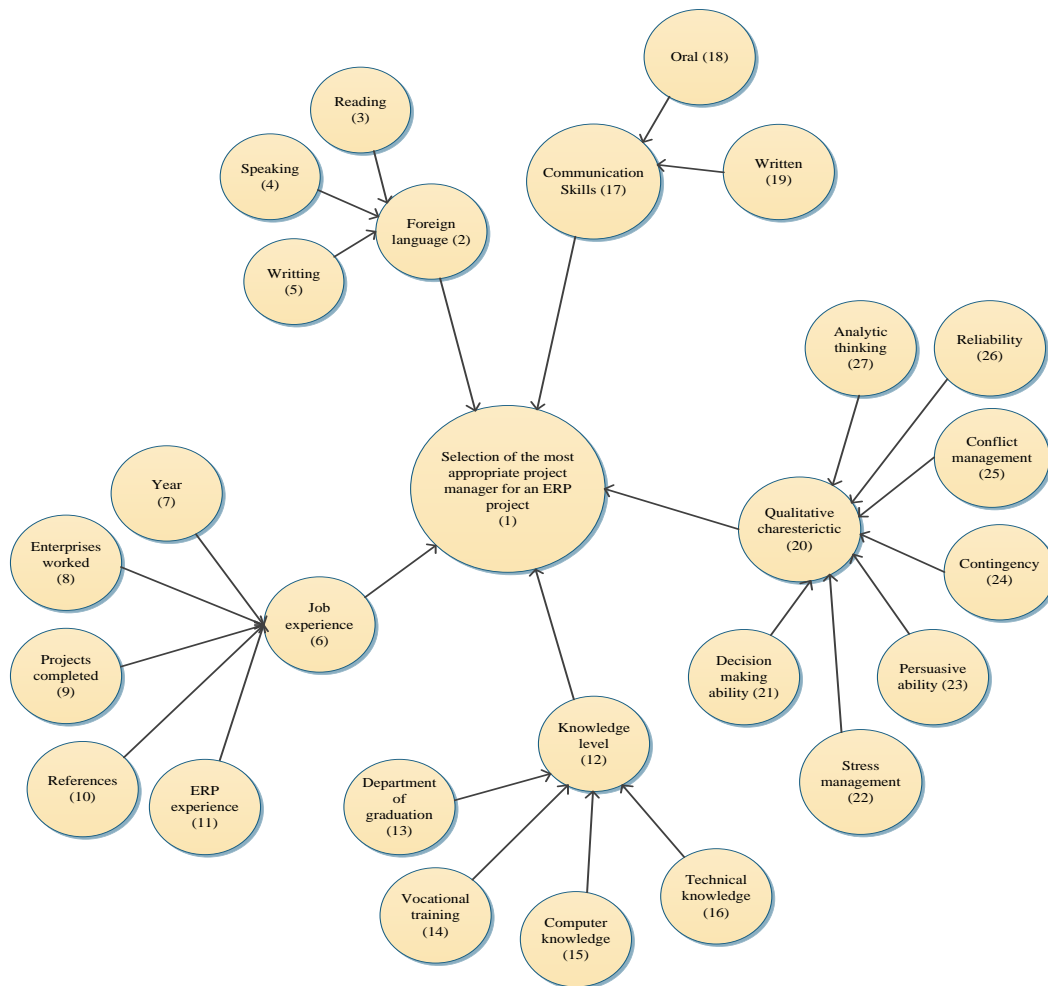**Figure 5**: Fuzzy cognitive map generated as a result of Delphi first step

Figure 6: Last form of fuzzy cognitive map

Table 2: FCM calculated criteria weights

Criteria	Mean	Weight	Sub-criteria	Mean	Weight
Foreign Language (FL)	0,7	0,0358	Reading	0,7	0,0358
			Speaking	0,85	0,0435
			Writing	0,6	0,0307
Job Experience (JE)	0,8	0,0409	Year	0,55	0,0281
			Enterprises worked	0,55	0,0281
			Projects completed	0,85	0,0435
			References	0,7	0,0358
			ERP experience	0,65	0,0332
Knowledge Level (KL)	0,6	0,0307	Department of	0,7	0,0358
			Vocational training	0,7	0,0358
			Computer knowledge	0,8	0,0409
			Technical knowledge	0,4	0,0205
Communication Skills (CS)	0,8	0,0409	Oral	0,8	0,0409
			Written	0,6	0,0307
Qualitative Characteristic (QC)	0,7	0,0358	Decision making ability	0,8	0,0409
			Stress management	0,9	0,046
			Persuasive ability	1	0,0512
			Contingency	1	0,0512
			Conflict management	1	0,0512
			Reliability	0,8	0,0409

	Analytic thinking	1	0,0512

Table 3: Criteria weights obtained from Delphi second step survey

Criteria	Sub-criteria	Mean	Weight
Foreign Language (FL)	Reading	5,8	0,0492
	Speaking	6	0,0508
	Writing	5,6	0,0475
Job Experience (JE)	Year	4,8	0,0407
	Enterprises worked	5,2	0,0441
	Projects completed	6,6	0,0559
	References	5	0,0424
	ERP experience	5,4	0,0458
Knowledge Level (KL)	Department of	3,4	0,0288
	Vocational training	3,8	0,0322
	Computer knowledge	4,4	0,0373
	Technical knowledge	3,4	0,0288
Communication Skills (CS)	Oral	5,8	0,0492
	Written	6,6	0,0559
Qualitative Characteristic (QC)	Decision making ability	6,8	0,0576
	Stress management	6,6	0,0559
	Persuasive ability	6,6	0,0559
	Contingency	6,2	0,0525
	Conflict management	6,6	0,0559
	Reliability	6,6	0,0559
	Analytic thinking	6,8	0,0576

Step 3: The alternatives are defined by the interviews with specialists. Criteria and the weights of criteria are presented by FCM and Delphi technique. As a result of comparing these two methods it's decided to use criteria weights obtained from Delphi technique. With Delphi technique a criterion may have a value from 1 to 7 in a flexible scale and it gives precise results. However, in FCM takes only a value of +less, +middle and +more. FCM enables specialists to decide easily by means of its visuality.

Step 4: Preference functions of each criterion are defined by PROMETHEE ranking method. With respect to the preference functions shown in Figure 2 obviously number of criteria are decreased to minimum since PROMETHEE ranking method provides more qualified result with less criteria. It's important which preference functions are defined by specialists for the combination. Table 4 and 5 present preference functions of all criteria and decreased number of criteria respectively.

Step 5: Specialists score each alternative after defining preference functions. As an example, foreign language criterion whose function type is defined as V type is given a value with a number between 1-10 for each alternative by specialists.

Step 6: Data about criteria, weights of criteria, alternatives and preference functions are entered into Visual Promethee software. The criteria weights are defined as the results of Delphi technique. The values of alternatives are the medians that have been reached via the surveys of specialists. Preference functions that are defined previously by specialists and parameter information with these preference functions could be seen in Table 6.

Step 7: At last step the results obtained from Visual Promethee software are reviewed and the complete rankings are determined. The most suitable ERP project manager alternative is selected as Alternative 3 with a Φ net value of 0,1846 (Table 7). In Figure 7 the graphical view of the alternatives is also shown.

Table 4: Preference functions of each criterion

Criteria	Sub-Criteria(of FCM)	Preference Function Type	Parameters
Foreign Language (FL)	Reading	V	s=5, r=10
	Speaking	V	s=5, r=10
	Writing	V	s=5, r=10
Job Experience (JE)	Year	IV	q=5, q+p=10
	Enterprises worked	II	l=5
	Projects completed	IV	q=5, q+p=10
	References	II	l=5
	ERP experience	IV	q=2, q+p=5
Knowledge Level (KL)	Department of	II	l=5
	Vocational training	II	l=5
	Computer knowledge	II	l=5
	Technical knowledge	II	l=5
Communication Skills (CS)	Oral	III	m=8
	Written	III	m=8
Qualitative Characteristic (QC)	Decision making ability	V	s=5, r=10
	Stress management	V	s=5, r=10
	Persuasive ability	V	s=5, r=10
	Contingency	V	s=5, r=10
	Conflict management	V	s=5, r=10
	Reliability	V	s=5, r=10
	Analytic thinking	V	s=5, r=10

Table 5: Preference functions of decreased number of criteria

Criteria	Preference Function Type	Parameters
Foreign language	V	s=5, r=10
Year (Job Exp.)	IV	q=5, q+p=10
Enterprises worked & Ref.	II	l=5
Projects completed	IV	q=5, q+p=10
ERP experience	IV	q=2, q+p=5
Knowledge level	II	l=5
Communication skills	III	m=8
Qualitative characteristics	V	s=5, r=10

Table 6: Input data of Visual Promethee

Criteria	Criteria Weights	Alternatives			Preference Function Type	Parameters
		1	2	3		
Foreign language	0,1312	9,3333	7,6667	6,3333	V	s=5, r=10
Year (Job Exp.)	0,1085	1	6	8	IV	q=5, q+p=10
Enterprises worked & Ref.	0,1153	8	5,5	7,5	II	l=5
Projects completed	0,1492	1	10	12	IV	q=5, q+p=10
ERP experience	0,1221	0,5	3	6	IV	q=2, q+p=5
Knowledge level	0,0848	8	8	9	II	l=5
Communication skills	0,1402	8	6	6,5	III	m=8
Qualitative characteristics	0,1486	6,8571	7,2857	8	V	s=5, r=10

Table 7: Complete Promethee rankings obtained from Visual Promethee

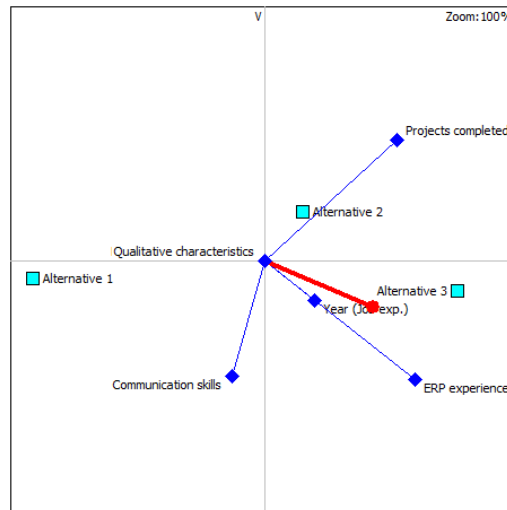| Alternatives	Φ_+	Φ_-	Φ net
Alternative 1	0,031	0,231	-0,2
Alternative 2	0,068	0,052	0,0154
Alternative 3	0,198	0,013	0,1846

Figure 7: GAIA plane for alternatives

V. CONCLUSION

ERP is an information system that can integrate the other departments of a firm. To set up and manage an ERP system successfully it needs to be assigned accurate ERP project managers. Therefore, project manager selection is extremely significant and difficult decision process for high-cost and time-consuming ERP projects. Companies must have to decide which ERP project manager is the most appropriate and the least costly for them. In this study, a number of criteria and associated sub-criteria influencing the match of managers to ERP projects are identified based on a thorough review of the related literature and interviews of management personnel involved in the selection process. We apply a combined multi-criteria decision-making method which consists of FCM, Delphi method and PROMETHEE in order to select ERP project managers. These three methods have been gathered up to a unique method to carry the most suitable alternative into practice. The results obtained show that the proposed method may be used as an effective decision aid in ERP manager selection. In this direction; efficiency of the questionnaires conducted by specialists, strength of the meetings and using the methods correctly are of vital importance for selection of the ERP project managers. For the future research, other MCDM methods for ERP project manager selection under fuzzy environment can be used for the extension of this work.

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EXPECTATION AND SATISFACTION ON IT SERVICE: A CASE STUDY OF SUAN SUNANDHA RAJABHAT UNIVERSITY IN THAILAND

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ABSTRACT

The aimed of the research were to study expectation and satisfaction on IT service of faculty of Science and Technology, Suan Sunandha Rajabhat University, Thailand. The populations for this study were selected by purposive sampling and questionnaire was used as instrument to analyze data by descriptive statistic. The result of this study found that staffs and students prefer to be serviced in person rather than on help desk counter and they suggest that IT helper should be more user friendly and provides information about the time that it would take to resolve issues. The total satisfaction level of the service providers was at the "highest" level for the services of the IT support, with the mean of 3.95. Also, the suggestion should enhance in management process of using computer laboratory and set explicitly the rules and regulations to use the room to clear and clarify for users.

Keywords: expectation, satisfaction, and IT service

1. INTRODUCTION

At present, the advancement of information technology has rapidly developed and has played an important role in various aspects of education. Both public and private universities provide information technology to promote the learning of students. The model of integrating technology into the curriculum means that computers are on demand throughout the school day [1], [4]. Therefore, the institute has a computer lab for learning. And teachers have a network connection. Buildings and facilities are one of the most important components of universities to make the teaching process more effective. According to Sasha Nikolic and et al, student satisfaction in the laboratory showed the important factors are determined the quality of the equipment and the changes conducted in the laboratory have been of great benefit for students learning [6]. The importance of laboratories was shown by survey all the 34 universities in Australia and the result found that the laboratory is the most important component of their courses [7].

Nowadays, there are many students in Faculty of Science and technology, Suan Sunandha Rajabhat University and the computer for educational purposes is provided to students and staffs. Therefore, the IT Services Support plays an important role to provide a number of critical technology services to staffs and students with ranging from managing over 1000 machines, printers and other resources in Faculty Science and Technology, SSRU. The team provides face to face, online and phone support for the technologies and systems within Faculty Science and Technology. Today's students search for institutions that will provide them with unique, memorable, and personal educational experiences and IT is one of the crucial factors that effect to he/she makes a decision [5]. When it comes to successful IT service, it is evidence to assess university's success.

The expectation and satisfaction theory is a cognitive theory that has been applied in many industries and studies (Linda Tran, 2016). Customer satisfaction has been considered as a significant topic in the marketing literature (Churchill and Suprenant, 1982). Satisfaction is a crucial metric to know how users feel about services and support team. This paper is examined to study the expectation and satisfaction on IT service

of faculty of Science and technology to improve computer room services and encourage the use of computer room services.

2. OBJECTIVES

1. To study the behavior of using the computer laboratory and machine equipment of staffs and students.
2. To develop the management process of IT support service, Faculty of Science and Technology.

3. METHODS

This study was based on descriptive research to study expectation and satisfaction on IT service of faculty of Science and Technology. The methodology included:

Participants

The participants in this study were 100 staffs and undergraduate students of Faculty of Science and Technology in the second semester of academic year 2017.

Research Instruments

Questionnaire was used to correct data and identify the expectation and satisfaction of IT service support and the topics included demographic data of participants, the computer lab management process and suggestion for improvement.
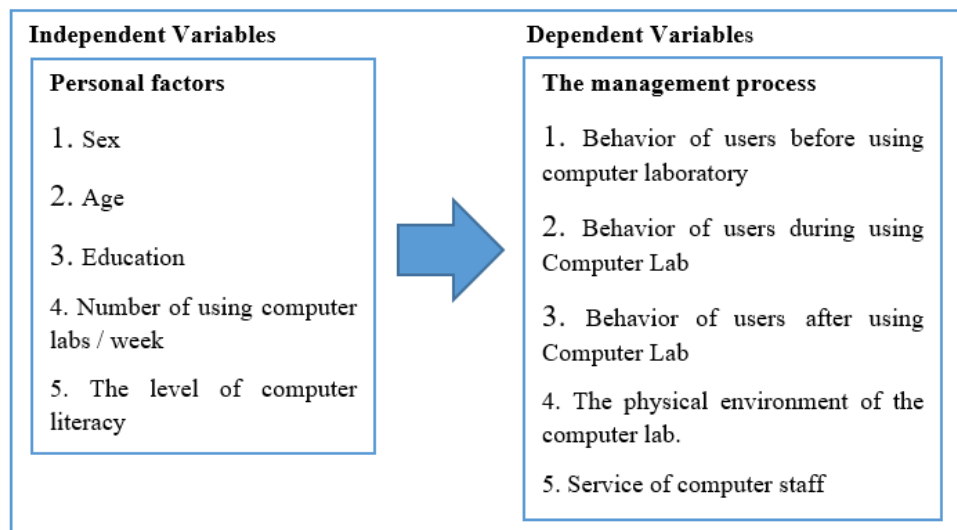

Figure 1. The concept of this research

Data analysis

The project was collected and analyzed data by using a computer program as follows: 1. General information for the sample group was analyzed by use of descriptive statistics i.e. distribution of frequency, percentage, mean, range, standard deviation. 2. The data regarding the computer lab management process and suggestion for improvement was analyzed by use mean and standard deviation.

4. RESULTS

After the data collection process, the results were analyzed by statistical description and the significant amount of quantitative and qualitative data collected from the 100 surveys allows to seek feedback on its services in its drive for continual service improvement. This study presented the results of the analysis of data in 2 phases by following this:

Results of general data analysis of respondents

The result found that, as shown in Table 1, there are 85 students and 15 staffs and 78 of all were male and 22 were female. Most respondents are student and 52% of respondents used computer lab 1-2 times/week and they also passed the computer literacy test in case of students.

Table 1. The Demographic Data of Participants

Characteristics	Variables	Value
Sex	Male	78
	Female	22
Age	18-20 years old	89
	20 years above 3	11
Education	Undergraduate	89
	Above	11
Number of using computer labs / week	1-2	52
	3-4	23
	above	25
The level of computer literacy	Passed	67
	Not passed	33

Note: N = 100

The computer lab management process

The results of the computer lab management process were shown in table 2 - 6. It was presented the result of behavior of users before using computer laboratory, behavior of users during using computer lab, behavior of users after using computer lab, the physical environment of the computer lab, and service of computer staff.

Table 2. The Results of Behavior of Users Before using Computer Laboratory

	$\bar{x}$	S.D
The purpose of using a computer lab	3.83	041
The procedures for using a computer lab.	3.90	0.39
The register process before take the key of computer room	3.10	0.24
Preparing a related device.	3.05	0.37

Table 3. The Results of Behavior of Users during using Computer Laboratory

	$\bar{x}$	S.D
The computer is turned on.	3.96	0.27
Access to active programs	4.58	0.46
Do not enter malicious programs.	3.75	0.21

Table 4. The Results of Behavior of Users After using Computer Laboratory

	$\bar{x}$	S.D
Turn off the computer	3.15	0.34
Turn off air conditioning	3.26	0.39
Keep the chair in place	3.01	0.25
Turn off the power	3.95	0.27

Table 5. The Results of the Physical environment of the Computer Laboratory

	$\bar{x}$	S.D
Appropriate size of computer	3.83	041
The suitability of Computer	3.90	0.39
Sufficiency of computer	3.10	0.24
Quality of computer	3.05	0.37
Room temperature	3.08	0.32
Appropriate Size of computer table set	4.0	0.2
Suitability of lighting	3.94	0.24
the availability of equipment in the room	3.96	0.27
Period of service	4.02	0.23
Speed and stability of the Internet.	3.78	0.23
Computer programs available on the computer	4.21	0.36

Table 6. The Results of Service of Computer Staff

	$\bar{x}$	S.D
There are sufficient numbers of faculty staff	3.69	0.28
The performance of a gentleman in service	4.12	0.21
The speed of service	4.13	0.19
Efficiency, solution suggestions and giving advice	4.91	0.36

When considering the satisfaction of the users in IT service support, respondents have average satisfaction in the service opening period and the rules for using the computer room. Second is the speed of contact and the least satisfactory service was to answer questions and provide guidance.

5. CONCLUSION AND FUTURE WORK

The study explains various factors such as behavior of users before using computer laboratory, behavior of users during using computer lab, behavior of users after using computer lab, the physical environment of the computer lab, quality of equipment and network and service of computer staff as a measure of IT service support quality. The result of this study found that staffs and students prefer to be serviced in person rather than on help desk counter and they suggest that IT helper should be more users friendly and provides information about the time that it would take to resolve issues. The total satisfaction level of the service providers was at the "highest" level for the services of the IT support, with the mean of 3.95. Also, the suggestion should enhance in management process of using computer laboratory and set explicitly the rules and regulations to use the room to clear and clarify for users.

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PARTICIPATION IN THE ANNUAL STRATEGIC PLAN OF THE FACULTY OF SCIENCE AND TECHNOLOGY SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

This research aims to study about staff's participation in the annual strategic plan of faculty of Science and Technology, Suan Sunandha Rajabhat University and determine relationship between staff's participation with gender and field of work. The sample was 107 official staff in Faculty of Science and technology by simple random sampling. The questionnaires were used to collect data and analyze by percentage, mean, standard deviation, and chi-square test.

The results showed that the official staff most was female in academic staff, with 0-5 years of experiences. In addition, the level of staff's participation both overall and each aspects (Participation in decision making, participation in operation, participation in receiving benefits, and participation in evaluation) were in high level. The relationship between staff's participation with gender and field of work were no significant differences at .05 levels in overall, participation in decision making, participation in operation, participation in receiving benefits, and participation in evaluation. In the other hand, there is statistically significant in relationship between participation in receiving benefits and year of experiences at .05 levels.

Keywords: Staffs' participation, Annual Strategic Plan, Strategic planning

1. INTRODUCTION

"Strategic Plan" or a systematic plan of action makes a mission and the future direction. To achieve the objectives and goals: Good strategic thinking, internal and corporate environment they should allow the organization to adapt and be prepared for the changes that will occur. In the strategic planning process, SWOT Analysis is an assessment of the organizational environment. To formulate strategies that lead to the achievement of objectives and goals [1].

Nowadays, the strategic plans of the university need to come from the participation of all personnel. For the university, it is an important agenda that needs to be aligned and the focus is on advancing the quality of education as a university. For local development Improving quality of life Reducing gaps and social inequalities creating local people to be sustainable. And have the ability to compete [2].

Office of the Dean of Faculty of Science and Technology, there is a plan and quality assurance department that plays a key role in all departments, so it recognizes the importance of the strategic plan formulated by the Faculty of Science and Technology because the strategic plan is to drive the management and development mechanism. Quality of education meets annual goals. Researchers are interested in studying this issue. To learn about the participation of personnel in the Faculty of Science and Technology for the improvement and development of the strategic plan, the researcher is interested in studying the participation in the annual strategic plan of the Faculty of Science and Technology, Suan Sunandha Rajabhat University.

2. OBJECTIVES

1. To study the level of opinions in participation in annual strategic plan of the Faculty of Science and Technology, Suan Sunandha Rajabhat University

2. To study the relationship of gender, field of work, position, and work experience with participation in annual strategic planning of the Faculty of Science and Technology, Suan Sunandha Rajabhat University.

3. METHODS

The population was used in the research are teachers and staff of the Faculty of Science and Technology.

The 107 sample by random sampling was used in the research [3].

The instrument in this study was questionnaires in evaluating of the annual strategic plan of the Faculty of Science and Technology, Suan Sunandha Rajabhat University.

4. DATA ANALYSIS

The questionnaires were analyzed statistically using a computer statistical software package to formulate the statistics. Descriptive statistics was used to explain personnel factors and participation levels in annual strategic plan of Faculty of Science and Technology, Suan Sunandha Rajabhat University. In addition, inferential statistic was used to determine the relationship between personnel factors and participation in the annual strategic plan by chi-square test.

5. RESULTS

Table I. MEAN AND STANDARD DEVIATION OF OPINION LEVEL IN PARTICIPATION IN THE ANNUAL STRATEGIC PLAN OF THE FACULTY OF SCIENCE AND TECHNOLOGY

Participant in Annual Strategic Plan	The level of opinion		
	$\bar{x}$	S.D.	Interpretation
1. participation in the decision	3.47	0.532	high
2. participation in the operation	3.43	0.487	high
3. participation in receiving benefit	3.42	0.470	high
4. participation in the evaluation	3.45	0.498	high
overall	3.44	0.464	high

Table I shows the overall and each aspect in participation in annual strategic plan of the Faculty of Science and Technology Suan Sunandha Rajabhat University. It was found that there are high level in overall and each aspect by the highest average was participation in the decision ($\bar{x}$= 3.47, S.D. = 0.532) and the lowest average was participation in receiving benefit $\bar{x}$= 3.42, S.D. = 0.470) respectively.

TAable II. MEAN AND STANDARD DEVIATION OF OPINION LEVEL IN PARTICIPATION IN THE ANNUAL STRATEGIC PLAN IN PARTICIPATION IN THE DECISION ASPECT

Participant in the decision	The level of opinion		
	$\bar{x}$	S.D.	Interpretation
1. You participate in the provision of information to support decision making, selection of activities or projects appropriate for strategic planning.	3.50	0.520	high
2. You are involved in planning, policy or program / project / activity.	3.48	0.604	high
3. You are involved in analyzing the causes of the problem and presenting the problem of strategic planning.	3.49	0.572	high
4. Are you involved in setting up a strategic planning process or plan?	3.32	0.653	average
5. You participate in the strategic plan activities.	3.52	0.554	high
Overall	3.47	0.532	high

Table II shows that opinion of participation in the decision was high in the overall and each item except there was average in involved in setting up a strategic planning process or plan ($\bar{x}$= 3.32, S.D. = 0.653). The highest opinion average was participate in the strategic plan activities ($\bar{x}$= 3.52, S.D. = 0.554).

Table III. MEAN AND STANDARD DEVIATION OF OPINION LEVEL ON PARTICIPATION IN THE ANNUAL STRATEGIC PLAN IN PARTICIPATION IN THE OPERATION

Participation in the operation	The level of opinion		
	$\bar{x}$	S.D.	Interpretation
1. You participate in brainstorming strategies.	3.42	0.550	high
2. You are involved in setting up a work plan.	3.43	0.569	high
3. You participate in the budget planning process.	3.42	0.568	high
4. You are involved, coordinated, relevant agencies. To achieve the achievement of the plan / project / activity.	3.35	0.480	high
5. You participate in the implementation of the strategic plan.	3.48	0.502	high
Overall	4.32	0.486	high

Table III shows that opinion of participation in the operation of overall were at a high level ($\bar{x}$= 4.32, S.D. = 0.486). In addition, the average of each items were 3.42, 3.43, 3.42, 3.35, and 3.48, respectively.

Table IV. MEAN AND STANDARD DEVIATION OF OPINION LEVEL ON PARTICIPATION IN THE ANNUAL STRATEGIC PLAN IN PARTICIPATION IN RECEIVING BENEFIT

Participation in receiving benefits	The level of opinion		
	$\bar{x}$	S.D.	Interpretation
1. You have the knowledge about the preparation of the action plan of the strategic plan.	3.43	0.535	high
2. You participate in the benefits of activities / projects under the strategic plan.	3.46	0.519	high
3. You see that the agency benefits from the implementation of the strategic plan.	3.40	0.529	high
4. You are very happy and proud when the projects are beneficial to you and your organization.	3.31	0.506	average
5. You see that the development of a strategic plan can solve the problem of the unit as well.	3.47	0.501	high
Overall	3.42	0.470	high

Table IV shows that opinion of participation in the receiving benefit was high in the overall and each item except there was average in happy and proud when the projects are beneficial to you and your organization ($\bar{x}$= 3.31, S.D. = 0.506). The highest opinion average was participate in the development of strategic plan can solve the problem of the unit as well. ($\bar{x}$= 3.47, S.D. = 0.501).

Table V. MEAN AND STANDARD DEVIATION OF OPINION LEVEL ON PARTICIPATION IN THE ANNUAL STRATEGIC PLAN IN PARTICIPATION IN THE EVALUATION

Participation in the evaluation	The level of opinion		
	$\bar{x}$	S.D.	Interpretation
1. You are involved in the formulation, monitoring and evaluation of strategic plans.	3.48	0.520	high
2. You are involved in controlling and monitoring the action plan under the strategic plan.	3.49	0.556	High
3. You participated in a summary of the results, analyzing the impact of the implementation of the strategic plan.	3.46	0.554	high
4. You participate in the monitoring of performance and problem conditions. Barriers to implementation of strategic plans.	3.34	0.531	average
5. You participate in providing feedback. Suggestions for improving strategic planning.	3.52	0.502	High
Overall	3.45	0.498	high

Table V shows that opinion of participation in the evaluation was high in the overall and each item except there was average in participate in the monitoring of performance and problem conditions. Barriers to implementation of strategic plans ($\bar{x}$= 3.34, S.D. = 0.531). The highest opinion average was participate in participate in providing feedback. Suggestions for improving strategic planning ($\bar{x}$= 3.52, S.D. = 0.502).

Table VI. THE RELATIONSHIP BETWEEN PARTICIPATION IN THE ANNUAL STRATEGIC PLAN BY
     PERSONNEL FACTORS

General Information	Participation in the annual strategic plan	df	χ^2	P-value
Sex	1. Participant in the decision	2	3.443	.179
	2. Participation in the operation	2	1.623	.444
	3. Participation in receiving benefits	2	1.152	.562
	4. Participation in the evaluation	2	2.054	.358
	Overall	2	1.835	.400
field of work	1. Participant in the decision	2	3.883	.144
	2. Participation in the operation	2	2.847	.241
	3. Participation in receiving benefits	2	1.790	.409
	4. Participation in the evaluation	2	3.121	.210
	Overall	2	2.788	.248
Position	1. Participant in the decision	2	3.883	.144
	2. Participation in the operation	2	2.847	.241
	3. Participation in receiving benefits	2	1.790	.409
	4. Participation in the evaluation	2	3.121	.210
	Overall	2	2.788	.248
Work experience	1. Participant in the decision	2	4.442	.350
	2. Participation in the operation	2	8.576	.073
	3. Participation in receiving benefits	2	9.908	.042*
	4. Participation in the evaluation	2	4.527	.339
	Overall	2	5.171	.270

Table VI shows that there are no significantly relationships between overall, participant in the decision, participation in the operation, participation in receiving benefits, and participation in the evaluation and personnel factors (gender, field of work, position) with p-values of .179, .444, .562, .358, 400, .144, .241, .409, .210, 248, 350, .073, .339 and .277 respectively. However, there was statistically significant relationship between participation in receiving benefits and work experience at .o5 level.

6. CONCLUSION AND FUTURE WORK

Based on the findings of this research, the findings in opinion of Participation in the annual strategic plan of the Faculty of Science and Technology Suan Sunandha Rajabhat University found that the aspect and the overall. The opinions were at a high level. When considering each aspect, it was found that participation in decision making Participation in the operation Participation in benefits and participation in evaluation. Consistent with the concept of [4] the belief that public participation Quality of decision making for organizational management. The participation in the information and opinions. It will help you to make more informed decisions. In addition, the research by [5] found that People in the Klong Mai community have been involved in the development of Sufficiency Economy Village. The overall aspects as well.

The findings of the relationship between gender, field of work, position, and work experience with opinions in Participation in the annual strategic plan of the Faculty of Science and Technology Suan Sunandha Rajabhat University found that there are no relationships. However, considering that the participation aspect of the beneficiaries is related to the participation in the annual strategic plan at 0.05 significant level, which is in line with [6] meaning that people's participation is the creation of the people in the development process. Creative and the effect of the activity must return to their own.

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THE WEB APPLICATION TO PROMOTE 7 UNSEEN PLACE IN SAMUT PRAKAN PROVICE, THAILAND

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ABTRACT

This research aims to develop the website of 7 tourist attractions in Samut prakan province. Bang Namphueng Floating Market, Phra Chulachomklao Fort, Sri Nakhon Khuean Khan Park and Botanical Garden, Phra Samut Chedi temple, Crocodile Farm Samut Prakan, Ancient Siam and Erawan Museum The system will present history. Architecture With stunning views, the map includes information that facilitates basic accessibility. The ability of online information systems to promote tourism. This system is developed by various software such as PHP, Java Script, MySQL, and has been measured by users and experts. The average and standard deviation of the users and experts were 4.13, 4.35 and 0.51, 0.52, respectively. In addition, Black Box testing was used to test the mean and standard deviation of 4.15, 4.25 and 0.55., 0.54, respectively.

Keyword: website, samut prakan, bangkok

1. INTRODUCTION

In Thailand, all provinces would have its provincial motto. Such as, Marine Battle Fortresses, Chedi in the Water, Crocodile Farm, Exquisite Ancient City, Phra Pradaeng Songkran Festival, Tasty Dried Snakeskin Gourami, Rap Bua Festival, Industrial Estate, it is a Samutprakarn's motto which called the Pak Nam city. Because it is located at the end of the Chao Phraya River. Close to the north coast of the Gulf of Thailand. And another name is Phra Pradaeng city.

To attract tourists, to presenting beautiful places and to presenting both our landscape and tradition. Performing arts and various activities is rare, for people to know about these. Therefore, we want to do the Recommended seven attractions in Samut prakarn website for support tourism and presenting what we have to the general distribution is of interesting and enjoy with this tourism.

The seven attractions recommended in Samut prakarn website is a website for presenting tourist attractions in Samutprakan province. For instance, Bang Namphueng floating market, Chulachomklao Fortress, Srinakornkuenkhun Park, Phra Samut Chedi temple, Samut prakarn Crocodile farm, the ancient city and The Erawan Museum. With history, architecture, beautiful view and Information of basic facilitate.

2. OBJECTIVES

1.To attract tourists, to presenting beautiful places and to presenting both our landscape and tradition. Performing arts and various activities is rare, for people to know about these.

2.Assessment of the ability of the system to meet the needs of the 5 experts and 50 users' respectively and results of the Black Box testing

3. METHODS

• Analysis and design

The seven attractions recommended in Samutprakarn website is a website for presenting tourist attractions in Samut prakan province. For instance, Bang Namphueng floating market, Chulachomklao Fortress, Srinakornkuenkhun Park, Phra Samut Chedi temple, Samutprakarn Crocodile farm, the ancient city and The Erawan Museum. With history, architecture, beautiful view and Information of basic facilitate. The overview of this work to explained that users can access to detail without having login. In this work, the

technique to use for analysis and design that can be divided into 4 steps as follow: system overview, use-case diagram of the system, Sequence Diagram of the system and the sample of home page as shown in Figure 1-4   consequently.
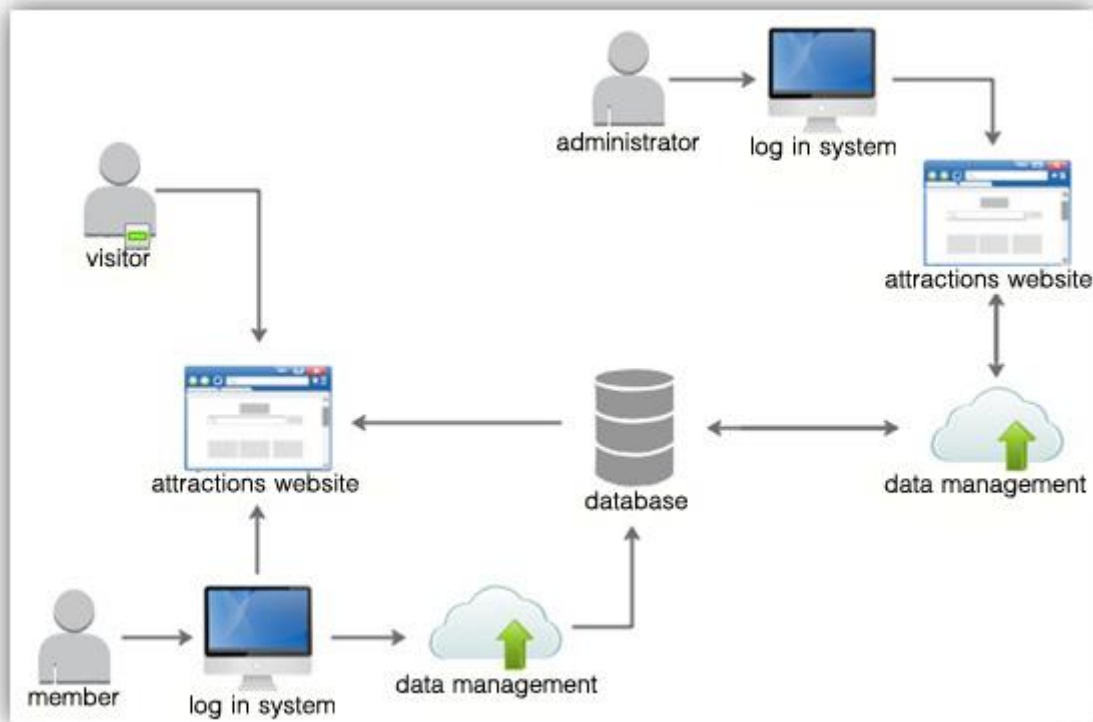

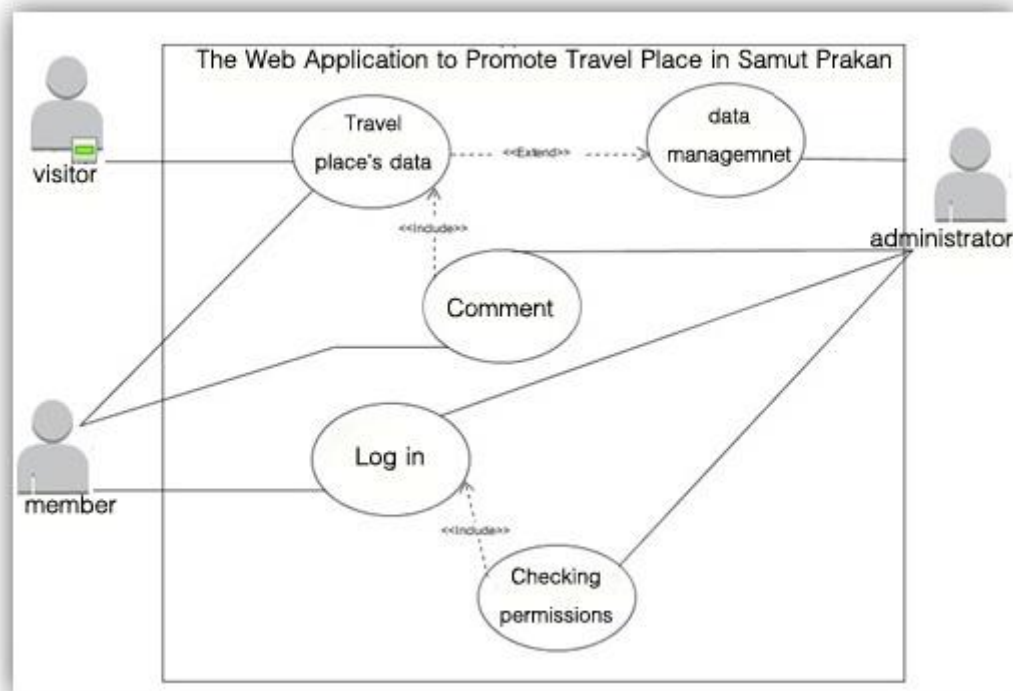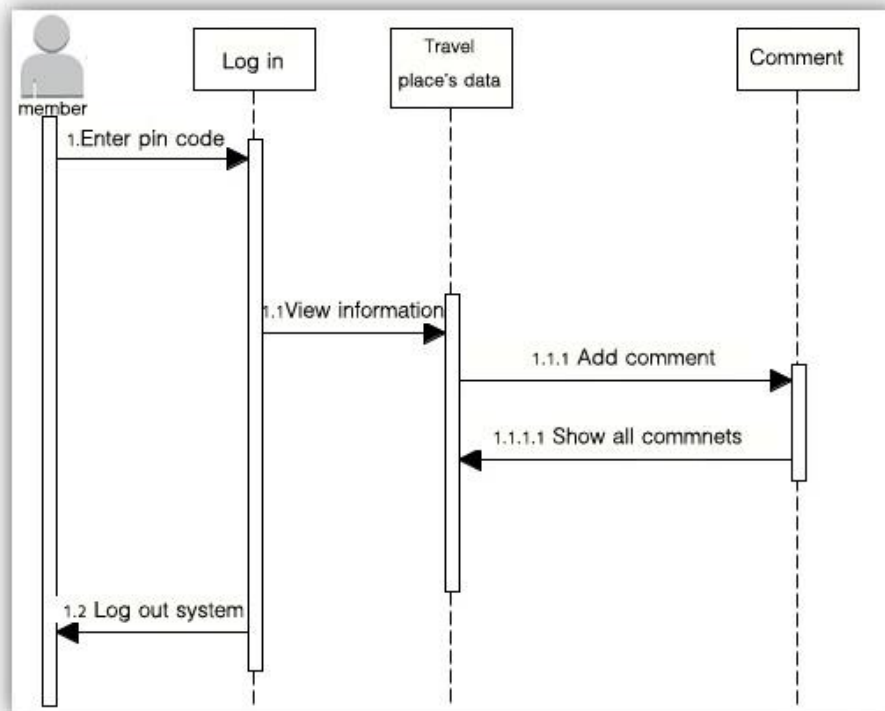**Figure 1**. Show Website of 7 tourist attractions in Samut prakan province management system

Figure 2. Use Case Diagram

Figure 3. Sequence Diagram

Figure 4. Home Page

4. RESULTS

The development The state of development The Web Application to Promote 7 Unseen Place in Samut Prakan Provice,Thailand, PHP, HTML, Adobe Photoshop CS5 , MS-Windows 8.1 and Java Script was used to implement and coding with MySQL database. The system consists of the detail interesting information's place, the travel map, ticket price, time schedules, search system, categorization system and map. The home page is displayed the menu keys such as location name search, arrow selection show, main menu, rotation menu and location map. The user can click on the map or some area, picture to see more information of each place. For a backend, the system administrator can be used to manage the policy such as log-in name and password. This system also offers the administrator to edit or updating more information any time that corresponded to the related information in the database.

Evaluate In the stat of evaluating the performance and satisfaction of The Web Application to Promote 7 Unseen Place in Samut Prakan Provice,Thailand, we tested and evaluated the performance of the system by using the Black Box Testing and Questionnaires. There are 5 experts and 50 users that were used to test this website. Black Box testing was estimated in the error of the project as follows: functional requirement test, Function test, Usability test, Performance test and Security test. The functional Requirement test was evaluated the ability of the system to support the requirements of the users and Functional test was used to evaluate the accuracy of the system the proposed by Amman and Offutt (2006) and Janpla et al. (2014). The suitability of the system was tested by the Usability test. Performance test was estimated the processing speed of the system. Lastly, Security test was applied to evaluate the security of the system that proposed in Laurie Williams (2006) as shown in Table 1

Table 1. The Results of the system evaluating

Category of Evaluation	Experts		Users	
	X̄	SD	X̄	SD
The ability of the system				
1. the ability of the system to provide information	4.2	0.42	4.37	0.39
2. the ability of the system to link menu	4.36	0.54	4.42	0.42
3. the ability of the system to search	4.15	0.56	4.51	0.53
4. the ability of the system's response time	4.18	0.53	4.22	0.51
5. the ability of the system to work automatically	4.32	0.54	4.55	0.53
6. the ability of the system to manage the database	4.11	0.56	4.45	0.51
The accuracy of the system				
1.the accuracy of the system to display information	4.24	0.43	4.52	0.43
2. the accuracy of the system to information retrieval	4.22	0.52	4.52	0.45
3. the accuracy of the system to update				
4. the accuracy of the system in storage	4.13	0.48	4.25	0.59
5. the accuracy of the system to report	4.24	0.54	4.6	0.52
6. the accuracy of the system in the overall system functions	4.18	0.47	4.4	0.54
The suitability of the system	4.21	0.45	4.41	0.58
1.the suitability of the functions with ease of system usage				
2. the suitability of text display clarity	4.12	0.53	4.34	0.55
3. the suitability of using color	3.95	0.55	4.21	0.51
4. the suitability of data presentation	4	0.51	4.23	0.52
5. the suitability of user interface	4.21	0.58	4.37	0.51
The speed of the system	4.35	0.51	4.42	0.56
1. the speed of program as a whole				
2. the speed of search data	4.12	0.52	4.35	0.57
3. the speed of data presentation	4.23	0.48	4.33	0.62
4. the speed of showing the link	3.69	0.52	4.12	0.49
5. the speed of edit data	3.58	0.51	4.23	0.58
The security and verify data of the system	4.01	0.54	4.15	0.57
1.the security and verify data of set the permissions of using				
2.the security and verify data of determining a user account	4.16	0.58	4.32	0.51
3.the security and verify data of verify the accuracy of input data	4.05	0.53	4.16	0.51

The table1 shows that assessment of the ability of the system to meet the needs of the 5 experts and 50 user's respectively in average of 4.13 and 4.35 and standard deviation of 0.51 and 0.52 so that satisfaction in quality toward the system is well.

Table 2. The results of the Black Box testing of the system

Category of Evaluation	Experts		Users	
	$\bar{x}$	SD	$\bar{x}$	SD
1. Function Requirement Test	4.15	0.56	4.34	0.55
2. Functional Test	4.23	0.55	4.05	0.54
3. Usability Test	4.03	0.54	4.32	0.54
4. Performance Test	4.21	0.56	4.34	0.53
5. Security Test	4.14	0.54	4.21	0.54
Average	4.15	0.55	4.25	0.54

The results of the Black Box testing of the system as show in Table 2 that a quality assessment of the system is well in all aspects and mean were 4.15 and 4.25 and standard deviations were 0.55 and 0.54 respectively.

5. CONCLUSIONS AND FUTURE WORK

In an efficiency of The Web Application to Promote 7 Unseen Place in Samut Prakan Provice,Thailand, the system was implemented by using any software that consists of PHP, HTML, CS6, AJAX, Java Script and MySQL database. Black Box Testing and Questionnaires were used to evaluating the system that estimated both 5 experts and 50 users. The result showed a statistically significant difference of quality assessment of the system is well in all research objectives. It can be concluded that an efficiency of the tourism web based to promote Attractions in Samut Prakan Province, Thailand.

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DEVELOPMENT OF A SMART CCTV APPLICATION WORKING WITH IOT TECHNOLOGY IN COMPUTER LABORATORY

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ABSTRACT

In the Department of Information Technology, the computer laboratories are most important for teaching and learning. Computer laboratories are in constant use and all the time. Lecturers and students use these facilities in class and out, the latter of which raises questions of security and the exposure of the university to the risk of lost, stolen, or damaged computer equipment. Additionally, the Internet of Things technology (IoT) consists of wireless internet connections with sensors that measure user needs. With this in mind, this study investigates the development of a smart CCTV working with IoT technology application in Computer Laboratory: a case study of department of information technology. Research methodology revolves around building a sensor system using Raspberry pi connects with a mobile phone for monitoring via the network. Sensor systems can alert administrators or authorized personnel when computer laboratory users who are not on the class schedule. This process can enhance the efficiency of computer laboratory security, protecting government property. Moreover it improves the safety of faculty members, staff and students in university. The result of this research suggests that smart CCTV can monitor the computer laboratory for abnormal access. The satisfaction level has been determined to be very good, making this prototype suitable for other, wider ranging projects.

Keywords: Internet of Things, computer laboratory, sensors, education

1. INTRODUCTION

Recently, Information and Communication Technologies (ICTs) are presented throughout the world and have great power to improve the outcomes of teaching and learning. Especially in university have computer laboratories for coding and practice class. Most of faculty of science and technology in university has computer laboratories for support student in information technology and computer science majors. Moreover their computer laboratories not have equipment or tool for real time security monitor. A lot of time computer lab has users who are not on the class schedule and the staff cannot determine who is accessing the computer lab. Therefore the management computer laboratory system is important system for organization to protect crime which has come to have a great impact for life and properties. From this problem, the researchers have developed a concept for intelligent CCTV applications, working with IOT technology in computer labs on the mobile network. The system can monitor the safety and can alert administrators or authorized personnel when computer laboratory users who are not on the class schedule in effectively.

Several researcher study with computer labs such as researcher designed intelligently and serve the purpose they were intended to serve [1], [2]. Two types of users in academic computer laboratory: students and instructors [3]. The requirements of users need to be identified to ensure this facility supports the purpose especially in current development of learning environment. The recent development of computer technology and availability has led to the rise of laptop and other computer ownership among students and eventually eliminated the need for campus computing laboratories [4], [5].

The Internet of Things: through radio frequency identification (RFID), infrared sensors, global positioning systems, laser scanners and other information sensing device, according to the agreed protocol, any items with the Internet connection, the exchange of information and communication, in order to achieve intelligent identification, tracking, positioning, monitoring and management of a network concept [6]. In addition some researcher proposed to develop mobile application for continuous dust monitoring less than 10

micron in faculty of science and technology, Suan Sunandha Rajabhat University. An easily accessible and cost-efficient dust monitoring system in computer lab that retrieves fine dust levels within a local area [7].

Some researcher introduces the key technology and architecture of the Internet of Things, and then puts forward a laboratory management mode based on the technology of Internet of things. The application in laboratory management was expounded. The results show that it can effectively improve the management efficiency and management level [8].

Nowadays, IoT platforms are based on cloud infrastructure. Mainly these platforms are used for collecting data from sensors and other smart devices from the environment in which are implemented. Cloud services and resources can be delivered by three cloud service models [9], [10], [11]: Platform as a Service (PaaS), Software as a Service (SaaS) and Infrastructure as a Service (IaaS). In this research the focus is on IoT PaaS.

In this research propose to enhance the efficiency of smart CCTV working with IoT technology application in Computer Laboratory. The methodology is combination of microcontrollers with CCTV camera for enhances data recording and motion detection in computer labs. Moreover this technique can increases the distance for video transmission over the Internet and the signal to a higher resolution.

2. OBJECTIVES

1. To development of application systems for smart CCTV connected to IOT systems.
2. To development of online alert system for computer laboratory.
3. For online monitoring for high efficiency of life and properties in organization.

3. METHODS

The Framework of Smart CCTV Application for computer laboratory based on Internet of Things is shown in Figure 1. The framework has 3 parts. First is computer laboratory, RFID readers are installed in the laboratory entrance. The students use RFID tags into the computer lab which automatic attendance records. Each device is affixed with electronic tags, recording equipment, automatically records of the equipment out of the laboratory. Moreover at the door of each lab has sensor for check when user come in lab by do not use student ID. The laboratory is equipped with CCTV monitoring, to protect the safety of the laboratory. Raspberry Pi was used with computer laboratory surveillance system which administrator can manage all cameras from one single place using MotionEyeOS. The Raspberry Pi is being powered with a 12VDC 1500mA wallwart connected to 2A DC-DC converter set to around 5.2V output. The user queries laboratory information via the Internet. The next is cloud computing section, the cloud storage is a model of data storage which the digital data is stored in logical pools. In this research store 4 databases 1) Smart CCTV application content, 2) Class schedule of all computer labs and Figure2 show example of class schedule , 3) CCTV video collection and Figure 3 example of CCTV image, 4) Activity log collection.
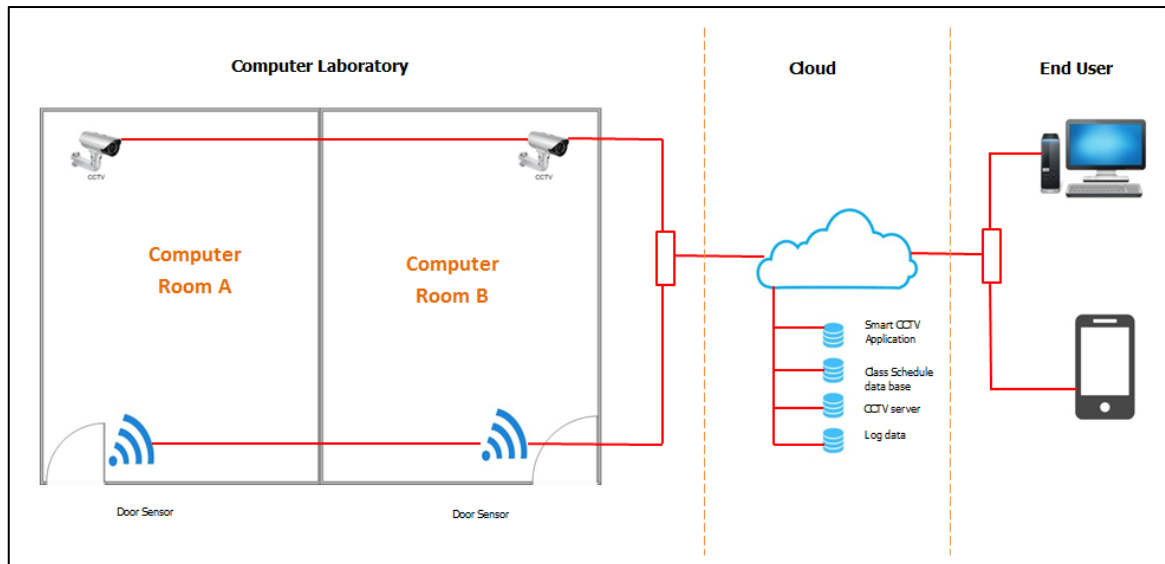
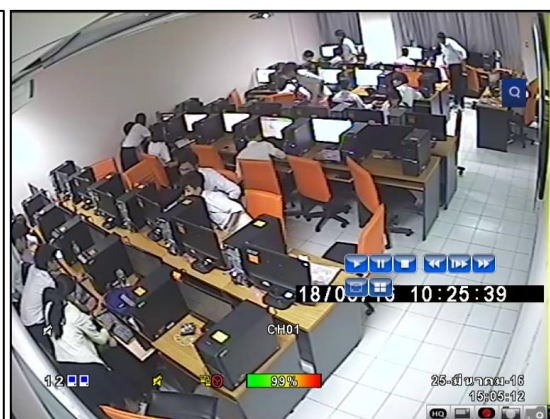**Figure 1.** Framework of Smart CCTV Application for computer laboratory.

Figure 2. Example of class schedule.

Figure 3. Example of CCTV image.

The last part of this Framework is End user which is the android application is designed to communicate with the Raspberry Pi via network socket and receive signal from CCTV. The data from the Raspberry Pi can be retrieved in real time, allowing admin to check the current computer lab usage. When, users who are not on the class schedule, the system will alert to administrator. The process of this research has 5 steps and the detail as follow:

1) Study and gathering
   The interviews requirement was conducted with 40 computer lab users. Researchers studied and gathered data information about Application of user needed, efficiency of system, alert system and other. The scopes of this research area are in computer laboratories of Suan Sunandha Rajabhat University.

2) Analysis and design system is through analysis of systems and web design for smart CCTV with IOT Technology in computer laboratories. The application structure was designed according to the information technology technique to monitoring.

3) Smart CCTV development is process for researcher developed the application system for administrator. This system to monitor user in computer laboratories based on analysis and system design. IOT was used in this process by connect Raspberry Pi with android application and collect

all data in cloud computing. Development of application for smart CCTV working with IOT technology in computer labs is an important part of the research. The system must be easy to use.

4) Testing system is tested regarding analysis and systems designs by experts and users. When a user login, System can control user access to the device via mobile application through the network system. The system must be able to operation via the board control, motion sensor and can get data from CCTV camera. The researchers used Apache JMeter tool to test application performance. Average Response Time factor is tested when users send a request to the server to each compare Response Time. Moreover researcher compares the accuracy of computer laboratories monitoring by using Smart CCTV system and not use Smart CCTV system.

5) User satisfaction is gathered via feedback from users, and assessment of data. The 40 subjects were invited to evaluation. The statistics was calculated by using arithmetic mean and standard deviation values.

4. EVALUATION SYSTEM AND RESULTS

This session including in three parts 1) Result testing of Average Response Time from Apache JMeter tool, 2) The comparison result of the accuracy of computer laboratories monitoring by using Smart CCTV system, 3) The result from the assessment of user satisfaction.

The process testing of Average Response Time by Apache JMeter tool is measure Response Time when a user requests a server. This experiment set Concurrent Connections value are 1, 5, 10, 15. Figure 4. Show result testing of Average Response Time from Apache JMeter tool. The results show that the efficiency of system can support for many users. When the number of Concurrent Connections increases, the response time will also increase.
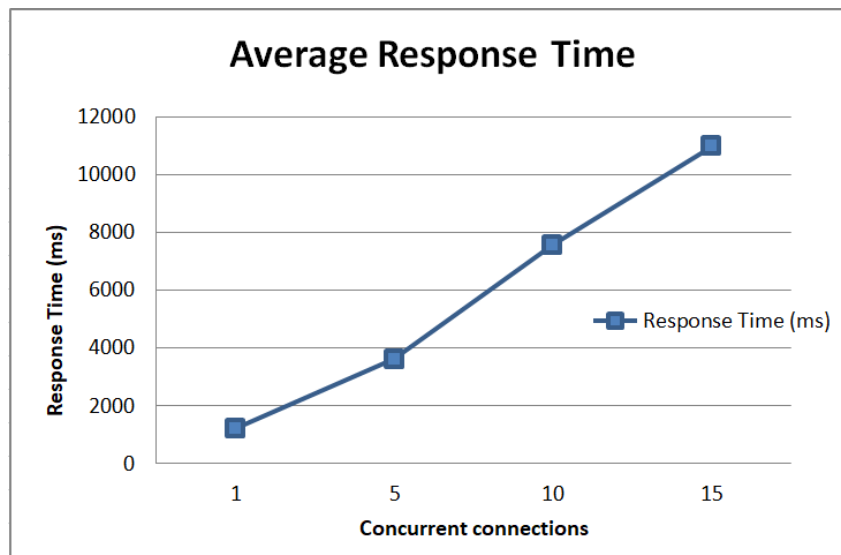

Figure 4. Result testing of Average Response Time from Apache JMeter tool.
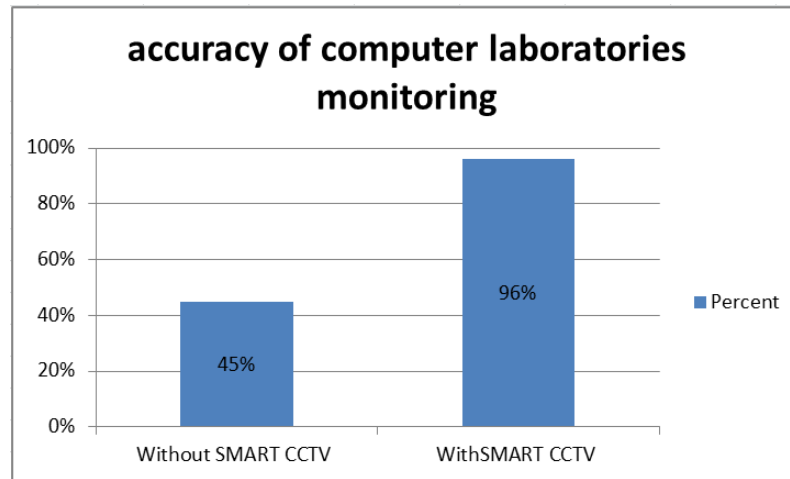
Figure 5. Example of CCTV image.

The accuracy is evaluated by performing 40 requests, first without SMART CCTV, then with it. Without SMART CCTV, sequential was correct 45% of the time, with SMART CCTV, the position was correct 96% of the time as illustrated in Figure 5.

To assess the systems, a researcher asked 40 system users including students and administrator in assessment. The subjects were asked to rate the relevancy of the search results on a five-point scale: Score 1 is the level of satisfaction improvement, Score 2 is minimum level of satisfaction, Score 3 is medium level of satisfaction, Score 4 is good and Score 5 is very good satisfaction. The result from the assessment in satisfaction in Smart CCTV application showed that system reliability and information was 3.68 and reliability was 0.194 which was in good level as shown in following Table 1:

Table 1. The assessment in satisfaction in Smart CCTV application.

Satisfaction List	Mean	Std.Error
Satisfaction with using CCTV	3.60	.284
Smart CCTV can connect on mobile	3.70	.260
Smart CCTV can help security property	3.60	.265
Smart CCTV are useful	3.95	.266
Smart CCTV is worth.	3.50	.246
CCTV is important for security and general.	3.75	.260
Average	3.68	.194

5. CONCLUSION AND FUTURE WORK

Development of smart CCTV applications works with IOT technology in the computer laboratory. The system can monitor user's access to the computer laboratory. The performance of the application can controlled and ordered through the device on mobile network. The prototype of this research was created by motion sensor and Raspberry Pi. Computer lab admin can operate and control CCTV. TCP/IP protocol was used to support the data transfer between mobile application and microcontrollers. The result of experiment testing and user satisfaction found that Smart CCTV application was in good level of efficiency. Mean that the smart CCTV system can also greatly help computer administrator and students who are visually, user can use the android application to monitor laboratory via mobile.

6. ACKNOWLEDGEMENTS

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THE OPINION IN CONTINUING GRADUATE STUDIES AT FACULTY OF SCIENCE AND TECHNOLOGY, SUAN SUNANDHA RAJABHAT UNIVERSITY

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ABSTRACT

The objective of this research was of studying the Opinion of Students of Science and Technology about Admission Suan Sunandha Rajabhat University. Identified by the population characteristics of students Suan Sunandha Rajabhat University value or uselessness of the Painted by Randomisation Number of 275 people, Stratified Sampling by Formulate as a department. The researcher used questionnaire for collecting data from those students which divided in two parts; The demography of students and The Opinion of Students about

Admission. The data is analyzed by statistical tools, including percentage, mean, standard deviation, t-test, f-test and analysis of variance by Least Square Difference (LSD) at the level of .05 statistical significance. (P= .05)

The results of the research are as follows: students of Suan Sunandha Rajabhat University from 412 people, Mostly is Female are 22 years old Study in Information Technology, the Opinion of Students of Science and Technology about Admission Suan Sunandha Rajabhat University overall and each side was at high level first part was about Institution, curriculum, and learning respective.

The objective of this research was of studying the Opinion of Students of Science and Technology about Admission Suan Sunandha Rajabhat University, There are different sexes and disciplines. There are different opinions on the admission process. About learning, male more than female. Curriculum, Institution and learning, students of Chemistry and students of Applied Physics have the opinion about Admission less than other students.

Keyword: Opinion, Admission, Demography, questionnaire

1. INTRODUCTION

Education is an essential process of human's quality of life development which is both capability and intelligence in order to be one force of country reinforcement and advancement. Also, it can enlarge the technology knowledge that can be used to develop economics and society of country. Focusing on higher education than bachelor degree, it is the way to clearly enhance learner's acknowledge and skill in specific way. Therefore, the institution plays the important role in building citizen potential. As it obviously shown that both public and private universities continuously attempt to adjust basic infrastructure of education quality, the curriculum, and learning management system, they want to develop new courses that can handle with the changes in economic and technology so that they could be the primarily famous institution of science and technology. However, the purpose of Bachelor of Science is to create the potential learners with moral and consciousness who can survive in changes in globalization. Nowadays, the Faculty of Science and Technology at Suan Sunandha Rajabhat University opens for various level of education including 2 departments of bachelor degree which has 13 majors, and 2 majors for master degree.

As mention above, the decision of students in attending in the faculty of science tends to help in developing the variety of learning management system by knowledge transferring or training. Then, the goal of education curriculum transferring is to create the effective, knowledgeable, and thoughtful learners for society. Thereby, the purpose of this research is to study about the opinion of admission in this Faculty of

Science and Technology. The result from this study can be benefit in successful supporting in course advertizing, educational activity and media developing of Suan Sunandha Rajabhat University.

2. OBJECTIVES

1. This study aims to investigate the students' opinion of the Faculty of Science and Technology Admission.
2. This study aims to compare students' opinion about the continuing admission according to classified demography.

3. METHODS

Participants

From this study, there are 412 college students of the Faculty of Science and Technology at Suan Sunandha Rajabhat University.

Samples

There are 275 undergraduate college students from the Faculty of Science and Technology that are used to be the samples from sample size calculating by Taro Yamane, 1970. Besides, the researcher chooses the sample by using stratified random sampling which they are classified by using the major of the students as the strata.

Instruments

The type of instrument that is used in this research is the questionnaire about the opinion of the Faculty of Science and Technology Admission of Suan Sunandha Rajabhat University students.

Data analysis

The researcher collects the data from the questionnaire, and it is analyzed by using statistical program which can help in descriptive statistics analysis. Furthermore, this tool includes the statistics, percentage, maximum, minimum, mean, standard deviation. The researcher compares the participant's opinion toward the admission of the Faculty of Science and Technology by using t-test (Independent t- test) and One-Way ANOVA (One Way Analysis of Variance)

4. RESULTS

From this research, the comparison of the level of opinion toward the continuing admission of the Faculty of Science and Technology is classified by the demography as followings:

Table 1. The Mean and Standard Deviation of the Level of Opinion toward the Bachelor of Science Admission
    in terms of the Curriculum.

The curriculum	Range of scale		
	Mean	S.D.	Meaning
1. The curriculum has the ASEAN University Network Quality Assurance (AUN-QA).	3.96	0.647	Strongly agree
2. The curriculum shows the diversity.	3.98	0.664	Strongly agree
3. The curriculum affiliates and meets the need of students.	4.00	0.686	Strongly agree
4. The available curriculum is notable nowadays.	3.97	0.685	Strongly agree
5. The credits in the curriculum are transferable across institution.	3.77	0.802	Strongly agree
Overall	3.94	0.479	Strongly agree

According to the table 1, it is illustrated that the overall level of opinion toward the Faculty of science and Technology admission in terms of the curriculum is in mostly agree range (Mean = 3.94, S.D. = 0.479). Furthermore, each topic also supports the fact that most participants agree with the effective curriculum affects them to choose this faculty as it is obviously shown in the table that all question are in the high range. As it sequentially show the top 3 most agreeable with these questions which are the curriculum affiliates and meets the need of students (Mean = 4.00, S.D. = 0.686) the curriculum that shows the diversity (Mean = 3.98, S.D. = 0.664), follows by the available curriculum is notable nowadays (Mean = 3.97, S.D. = 0.685).

Table 2. The Mean and Standard Deviation of the Level of Opinion toward the Bachelor of Science Admission
in terms of the Process of Learning Management System

The process of learning management system	Range of scale		
	Mean	S.D.	Meaning
1. The educational media is always up-to-date.	3.92	0.782	Strongly agree
2. The teaching style is diverse regard of learner's need.	3.89	0.725	Strongly agree
3. Having obvious liaison system between learners and teachers.	3.89	0.744	Strongly agree
4. The information technology management is modern	3.92	0.786	Strongly agree
5. Having an exchange student program for studying in country and abroad.	3.77	0.847	Strongly agree
Overall	3.88	0.610	Strongly agree

From the result in table 2, it is showed that the overall opinion toward the Faculty of science and Technology Admission in terms of the process of learning management system has high mean (3.88) and S.D (0.610). Moreover, it reveals that each opinion in each question is also in the high range of scale. First, they mostly agree with the fact that the educational media is always up-to-date is the main reason for them with Mean of 3.92 and S.D. of 0.782. Then, the information technology management is modern (Mean = 3.92, S.D. = 0.786), followed by having the teaching style which is diverse regard of learner's need (Mean = 3.89, S.D. = 0.725), and having obvious liaison system between learners and teachers (Mean = 3.89, S.D. = 0.744) respectively.

Table 3. The Mean and Standard Deviation of the Level of Opinion toward the Bachelor of Science Admission
in terms of the Institution

In terms of institution	Range of scale		
	Mean	S.D.	Meaning
1. The institution's environment is shady and pleasant.	4.11	0.753	Strongly agree
2. The institution has their standardization and proper education management.	4.00	0.712	Strongly agree
3. The institution has various and different courses.	3.90	0.731	Strongly agree
4. The institution has the scholarship to support students.	3.90	0.765	Strongly agree

5. The institution creates plenty of successful alumni.	3.92	0.728	Strongly agree
Overall	3.90	0.618	Strongly agree

As it is shown in the table 3, the overall opinion toward the Faculty of science and Technology Admission in terms of the institution has high mean which is 3.90 and S.D is 0.618. It is also founded that each opinion in terms of the university themselves is in the preferable range. Therefore, the most preferable opinion toward institution is that the institution's environment is shady and pleasant (Mean = 4.11, S.D. = 0.753), follows by the institution has their standardization and proper education management (Mean = 4.00, S.D. = 0.712), and the institution creates plenty of successful alumni (Mean = 3.92, S.D. = 0.728) orderly.

Table 4. The Mean and Standard Deviation of the Level of Opinion toward the Admission of the Faculty of Science and Technology in each aspect and overall

The opinion of students from the faculty of Science and Technology about further studying	Range of scale		
	$\bar{x}$	S.D.	Meaning
1. The curriculum aspect	3.94	0.48	Strongly agree
2.The learning management system aspect	3.97	0.58	Strongly agree
3.The institution aspect	3.90	0.62	Strongly agree
Overall	3.92	0.41	Strongly agree

According to the table 4, the descriptive data about the opinion toward the Faculty of Science and Technology Admission in terms of in overall aspect indicates that the participants strongly agree in all aspect with the Mean of 3.92, and S.D. of 0.41. Respectively, from the most preferable aspect to the least one, the learning management system (Mean = 3.97, S.D. = 0.58), the curriculum aspect (Mean = 3.94, S.D. = 0.48), and the institution aspect (Mean = 3.90, S.D. = 0.62).

Table 5. The Comparison of the Opinion toward the Admission of the Faculty of Science and Technology Classified by Gender

Opinion toward the Admission of the Faculty of Science and Technology	Gender	$\bar{x}$	S.D.	t	df	p-value
1. The curriculum aspect	Male	3.95	0.41	0.322	267.236	0.748
	Female	3.93	0.52			
2. The learning management system aspect	Male	3.98	0.58	2.277*	273	0.024
	Female	3.81	0.62			
3. The institution aspect	Male	4.02	0.52	1.238	260.173	0.217
	Female	3.93	0.61			
Overall	Male	3.98	0.42	1.643	273	0.102
	Female	3.89	0.47			

*At significant level 0.05

As shown in table 5, the overall and each aspect result from comparing the participant's opinion is classified by gender. Moreover, it is orderly indicated by using P-value and founded that the highest score is the curriculum aspect (0.748), followed by the institution aspect (0.217). From these P-values, they are more than 0.5 which mean that different gender factor did not affect in at the significant level of the student's opinion toward the admission. Furthermore, the learning management system aspect has the P-value of 0.024 which is

less than 0.05 of the significant level. So, it shows that the different gender factor of the student's opinion toward the admission affects in the significant level.

Table 6. The Comparison of the Opinion toward the Admission of the Faculty of Science and Technology Classified by Age

	Source of variation	df	SS	MS	F	p-value
1. The curriculum aspect	Between group	2	0.501	0.250	1.094	0.336
	Within group	272	62.263	0.229		
	Total	274	62.764			
2. The learning management system aspect	Between group	2	0.711	0.356	0.954	0.386
	Within group	272	101.369	0.373		
	Total	274	102.080			
3. The institution aspect	Between group	2	1.106	0.553	1.660	0.192
	Within group	272	90.560	0.333		
	Total	274	91.665			
Overall	Between group	2	0.274	0.137	0.669	0.513
	Within group	272	55.785	0.205		
	Total	274	56.060			

According to table 6, the outcome of the comparison of the opinion toward the admission of the faculty of science and technology classified by age is analyzed by using statistical tool which is T-test. The overall P-value is 0.513. Moreover, it is respectively indicated about each aspect that the highest score is the learning management system aspect (0.386), followed by the curriculum aspect (0.336), and the institution aspect (0.192), and they are all more than 0.05 of the significant level. Thereby, it is interpreted that there is no differences in their opinion toward the admission or the further studying.

5. CONCLUSION AND FUTURE WORK

From this research, the research has concluded the essential points as followings:
1. The student's opinion toward the admission in each aspect is all in high range of scale which are the learning management system aspect, followed by the curriculum aspect, and the institution aspect respectively. Therefore, this indicated that these students pay attention to the learning management system and course syllabus. That makes this result emphasized the idea of Renumas (2016). According to Renumas (2016), she claimed that the curriculum consisted of 3 courses: the general education courses that focuses on developing the perfective learners, specific requirement courses (the main important part) aims to develop different learners in each major, and free elective course is the opportunity for learners to seek for what they interest to study apart from what they need to learn from their faculty and major. Nevertheless, other courses can also encourage student skills and experiences. As Adisai&Therada (2013) found that the factor that related to the opinion of science students in further education attending is in the high range are academic activity, science interest, science aptitude, science activity interest factors respectively. Still, the public relation, and personal environment factors are in the moderate range of scale or neutral.
2. From the study of the opinion in continuing graduate studies at Faculty of Science and Technology, Suan Sunandha Rajabhat University, it is revealed that students with different gender shows different attitude toward learning management system. On the contrary, there is no different opinion about the curriculum and the institution. This result emphasized the fact that teaching science is not only concentrate on the theories but also the practice. Turiman, et.al., 2012 (as cited in Prasard Neungchaleum, 2015) also supported how important

the science is because the process in science is the tool that lead humanity to the knowledge and advancement. Because the learning in this century is limitless, the survivors depend on needed skills such as information technologies acknowledge, creative problem solving, effective communication, and innovation production.

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