UNDERGRADUATE STUDENTS' PERCEPTIONS IN FACULTY OF INDUSTRIAL EDUCATION AND TECHNOLOGY AT KING MONGKUT'S UNIVERSITY OF TECHNOLOGY THONBURI TOWARD TEACHING AND LEARNING IN THAILAND 4.0 ERA

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ABSTRACT

The purpose of this research was to study the comparison of personal factors on perceptions and to study the suggestions of students' perceptions in Faculty of Industrial Education and Technology at King Mongkut's University of Technology Thonburi (KMUTT) towards teaching and learning in Thailand 4.0 Era. The sampled group of this research is the undergraduate students of industrial education and technology at KMUTT in term 1/2018. The researcher collected the data by using quota sampling. In this survey, the researcher had a great response rate. This was conducted by using a questionnaire to collect data using 176 samples. Data were analyzed by frequency, percentage, median, and standard deviation-testing the value (*t*-test) and one-way ANOVA (Analysis of Variance).

According to the results, the number of respondents were mostly female 54.19% (97 respondents). Besides, 46.93% (84 respondents) of them were at an average age ranging from 18 to 19 years old. Also, 40.22% (42 respondents) of the respondents were first-year students.

The overall perception of Bachelor's degree students was at a high level. When considering by aspect, each phase was provided at a high or moderate level.

A comparative analysis of students' perceptions towards teaching and learning in Thailand 4.0 Era at a significance level of .05, showed that according to undergraduate students at different genders, there was no difference in the perception towards teaching and learning in Thailand 4.0 Era.

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One-way ANOVA analysis results indicated that the perception of students from the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards skills in self-adjustment and knowledge about Thailand 4.0 classified by age was not different. However, the perception of instructional activities was different with .05 statistical significances.

One-way ANOVA analysis results also indicated that the perception of students from the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards self-adjustment classified by year level was not different while the perception on skills in instructional activities and knowledge about Thailand 4.0 was different with .05 statistical significances.

Keywords: perception, teaching management, Thailand 4.0, KMUTT.

INTRODUCTION

The knowledge is changing rapidly, especially advanced technology. Learning is not just a relay knowledge from the instructors to the learners known as Thailand Education 4.0 (Kriangsak Chareonwongsak, Online, 2016). Technology trends could be performed more effectively. The instructors have to develop themselves by changing the teaching and learning processes, and learning activities. Teaching should correspond to students' behavior. Utilizing new technology in the classroom is a great way to bring enthusiasm among the students which brings more challenges for teachers. Teachers should develop their potential in order to meet the needs of a changing society that is focused on the learner, not just the pursuit of knowledge. They need to be innovative and creative in order to change from Education 3.0 into a new teaching system which also known as Education 4.0 (Office of the Education Council, 2016).

Education 4.0 exists to let the students apply their knowledge integration for innovation development in order to respond to social needs. Nowadays, the teachers don't let students to think or do activities by themselves. Most of them tell students to practice the same questions. Learners do not learn about living in society. Majority of them spend time on the internet playing games, shopping, scrolling through

Instagram, and chatting. In terms of technology, technology is not bad for you. (Pornchai Jedaman et al., 2016). To help students develop skills useful in the 21st Century, it requires many elements for learning development such as a well-structured education system, experienced teachers, a proper teaching process, various teaching activities that include information technology to enable learning skills.

Therefore, reforming Thailand's education towards 4.0 is very important. For example, developing the English language skills is the tool for communication, for sharing knowledge, and collaboration. The Ministry of Education has many projects, such as Boot Camp for Developing English Language Teachers, Echo Hybrid, and Echo English Applications. STEM Education (math and science) to make students understand the world and the material. Students of the future should focus on the cultures and learn new things.

Students, parents, teachers, and institutions need to prepare themselves for the new world. A study of the perception of the Bachelor's degree students from the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, toward teaching and learning in Thailand 4.0 Era would be useful and applicable for upgrading Thai education in the future. It is also useful for people who are interested to use it as a teaching guide to create lessons that are efficient and effective.

RESEARCH OBJECTIVES

1. To study the undergraduate students' perceptions at the Faculty of Industrial Education and Technology at KMUTT toward Thailand Education 4.0 Era.
2. To compare the undergraduate students' perceptions at the Faculty of Industrial Education and Technology at KMUTT toward Thailand Education 4.0 Era.
3. To study the suggestions of students' perceptions at the Faculty of Industrial Education and Technology at KMUTT toward Thailand Education 4.0 Era.

CONCEPTUAL FRAMEWORK

The conceptual framework for this study, as shown in figure 1 is based on theories.

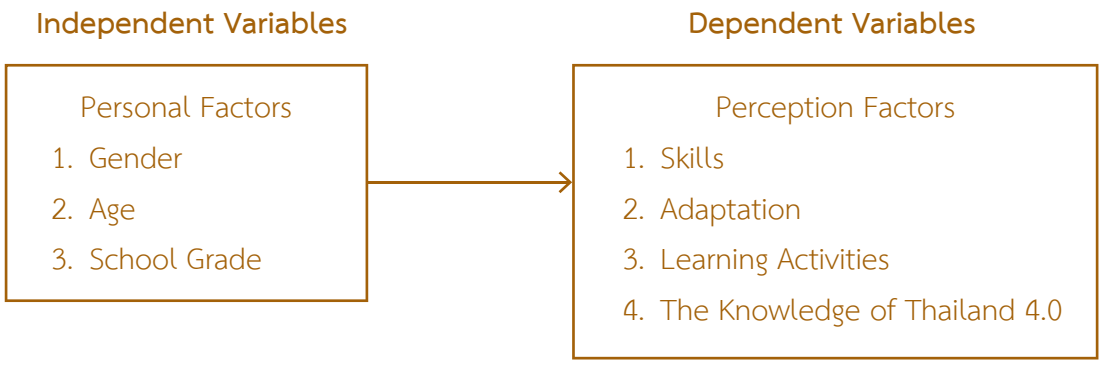

Figure 1. Conceptual Framework

HYPOTHESIS

1. The undergraduate students' gender differences are affecting the learning perception for Thailand 4.0 Era.

2. The undergraduate students' age differences are affecting the learning perception for Thailand 4.0 Era.

3. The undergraduate students' school grade differences are affecting the learning perception for Thailand 4.0 Era.

SCOPE OF RESEARCH

1. The population of this research is the 326 undergraduate students' perceptions at the Faculty of Industrial Education and Technology at KMUTT in Term 1/2018

2. The sample of this research is at least 125 undergraduate students' perceptions at the Faculty of Industrial Education and Technology at KMUTT. The researcher considers the sample size of the population which was 0.5. 5% of error and the 95% confidence level were calculated by using Krejcie and Morgan table (Krejcie & Morgan, 1970, p. 608) The population was the 326 undergraduate students at the Faculty of Industrial Education and Technology at KMUTT in Term 1/2018. The sample was 176 undergraduate students.

3. The content scope for this research is to study the undergraduate students' perceptions at the Faculty of Industrial Education and Technology at KMUTT towards teaching and learning in Thailand 4.0 Era.

3.1 Independent Variable

3.1.1 Personal Factors

3.1.1.1 Gender

3.1.1.2 Age

3.1.1.3 School Grade

3.2 Dependent Variable is the students' perceptions towards teaching and learning in Thailand 4.0 Era.

3.2.1 Skills

3.2.2 Adaptation

3.2.3 Learning Activities

3.2.4 The knowledge of Thailand 4.0

METHODOLOGY

This research aims to study and to compare the students' perceptions at the Faculty of Industrial Education and Technology at KMUTT towards Thailand Education 4.0 Era in order to improve the teaching and learning institutes and benefit others who are interested.

1. Population and Sample

1.1 The population

The 326 undergraduate students at the Faculty of Industrial Education and Technology at KMUTT in Term 1/2018.

1.2 The sample

176 undergraduate students. The size of the sample is determined by using Krejcie and Morgan table (Krejcie & Morgan, 1970, p. 608)

2. Research Instrument

The instrument used in this research was a questionnaire constructed by the researcher.

Part 1: General question about the respondents with the survey checklist: gender, age, class.

Part 2: The suggestions of students' perceptions at the Faculty of Industrial Education and Technology at KMUTT toward Thailand Education 4.0 Era were 4 parts which were skills, adaptation, leaning activities, and the knowledge of Thailand 4.0

Range of 5- Likert scale

5 is Completely agree

4 is Somewhat agree

3 is Neither agree nor disagree

2 is Somewhat disagree

1 is Completely disagree

Part 3: Using open-ended survey questions for the suggestions of students' perceptions at the Faculty of Industrial Education and Technology at KMUTT towards teaching and learning in Thailand 4.0 Era.

3. Data Collection

3.1 Data were collected at the first semester in 2018 among all first year students by giving the questionnaires out and back by myself.

3.2 Gathering the completed questionnaires and analyzing the survey data.

4. Data Analysis

This researcher used relevant statistics to analyze data by using SPSS (Statistics Package for the Social Sciences) to describe research findings, hypothesis testing, and data processing. The statistics is divided into two parts.

4.1 Descriptive statistics as shown below:

4.1.1 Frequency Distribution and Percentages

4.1.2 Arithmetic mean

4.1.3 Standard deviation

Range of 5- Likert scale see Table (Boonchom Srisa-ard, 2010)

Average Score	Interpretation
4.51 - 5.00	Completely agree with the perceptions toward Thailand Education 4.0 Era
3.51 - 4.00	Somewhat agree with the perceptions toward Thailand Education 4.0 Era
2.51 - 3.50	Neither agree nor disagree with the perceptions toward Thailand Education 4.0 Era
1.51 - 2.50	Somewhat disagree with the perceptions toward Thailand Education 4.0 Era
1.00 - 1.50	Completely disagree with the perceptions toward Thailand Education 4.0 Era

4.2 Inferential Statistics as shown below

4.2.1 Independent Sample *t*-test

4.2.2 One-way ANOVA (*F*-test)

FINDINGS

Analysis result of personal information of the respondent indicated that most of the sample group (97 persons) were female (54.19%), followed by 82 male respondents (45.81%). Most of them, 84 persons, aged between 18-19 years old (46.93%), followed by 20-21 years old (63 persons, 35.20%), and over 21 years old (32 persons, 17.88%). Most of the sample group, 72 persons, were in the first year (40.22%), followed by 64 persons in the fourth year (35.75%), 28 persons in the second year (15.64%), and 15 persons from the third year (8.38%) respectively.

The perception of Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning, both overall and by aspect was at a high level ($\overline{X}$ = 3.58, *SD* = 0.86). Considering by aspect, each aspect was at a high or moderate level: instructional activities ($\overline{X}$ = 3.69, *SD* = 0.84), skills ($\overline{X}$ = 3.65, *SD* = 0.82), knowledge about Thailand 4.0 ($\overline{X}$ = 3.56, *SD* = 0.86), and self-adjustment ($\overline{X}$ = 3.38, *SD* = 0.90) respectively.

The overall perception of Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards skills was at a high level ($\overline{X}$ = 3.65, *SD* = 0.82). Considering by aspect, each aspect was at a high and moderate level: computer and technology ($\overline{X}$ = 3.91, *SD* = 0.82), analysis thinking and problem-solving ($\overline{X}$ = 3.81, *SD* = 0.81), career and learning skill ($\overline{X}$ = 3.71, *SD* = 0.75), creative and innovative thinking ($\overline{X}$ = 3.70, *SD* = 0.79), good communication ($\overline{X}$ = 3.61, *SD* = 0.82), teamwork and leadership ($\overline{X}$ = 3.49, *SD* = 0.82), and new innovation creation using science, mathematics, technologies, and engineering process ($\overline{X}$ = 3.33, *SD* = 0.89).

The overall perception of Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards self-adjustment was

moderate ($\overline{X}$ = 3.38, *SD* = 0.90). When considering by aspect, each aspect was at a high and moderate level: answering questions by using information as a reference and suggesting practical solutions ($\overline{X}$ = 3.56, *SD* = 0.79), new unique and acceptable creativity ($\overline{X}$ = 3.49, *SD* = 0.86), creating new innovation applying what have learnt ($\overline{X}$ = 3.43, *SD* = 0.86), accurate communication in English ($\overline{X}$ = 3.27, *SD* = 0.99), and appropriate mathematics knowledge application ($\overline{X}$ = 3.16, *SD* = 0.93).

The overall perception of Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards instructional activities was at a high level ($\overline{X}$ = 3.69, *SD* = 0.84). Considering by aspect, each aspect was at a high level: outside classroom activities and workshop ($\overline{X}$ = 3.76, *SD* = 0.91), activities related to daily routine by technologies ($\overline{X}$ = 3.71, *SD* = 0.82), learners study from the instructional activities such as creativity, teamwork, communication, and analysis ($\overline{X}$ = 3.69, *SD* = 0.83), they promote new knowledge and innovation to the learner ($\overline{X}$ = 3.65, *SD* = 0.84), and the instructional activities on projects and problem-solving ($\overline{X}$ = 3.62, *SD* = 0.81).

The overall perception of Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards knowledge about Thailand 4.0 was at a high level ($\overline{X}$ = 3.56, *SD* = 0.86). Considering by aspect, each aspect was at a high and moderate level: knowledge of access and search more information from digital media and internet ($\overline{X}$ = 3.88, *SD* = 0.83), knowledge and understanding about the problem and finding creative solution ($\overline{X}$ = 3.69, *SD* = 0.76), knowledge and skills in social interaction and teamwork efficiently ($\overline{X}$ = 3.66, *SD* = 0.79), knowledge about skills and new job development to prepare for a future change ($\overline{X}$ = 3.53, *SD* = 0.83), knowledge about driving model for security, wealth, and sustainability ($\overline{X}$ = 3.3, *SD* = 0.87), and knowledge about creating cluster, technologies, and innovation ($\overline{X}$ = 3.26, *SD* = 0.91).

The results of a comparative analysis on perception of Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning by

Independent Sample *t*-test with .05 statistical significance illustrated that students of different genders had the same perception on Thailand 4.0 instructional planning.

One-way ANOVA analysis result using LSD (Fisher's least significant different) indicated that the perception of the Bachelor's degree students, Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards skills in self-adjustment and knowledge about Thailand 4.0 classified by age was not different whereas the perception on instructional activities was different with .05 statistical significances.

One-way ANOVA analysis result using LSD (Fisher's least significant different) indicated that the perception of the Bachelor's degree students at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, on Thailand 4.0 instructional planning towards self-adjustment classified by year level was not different while the perception on skills in instructional activities and knowledge about Thailand 4.0 was different with .05 statistical significances.

DISCUSSION

1. Regarding skills, the respondents gave significance to this factor at a high level. The most important one was the use of computer and technology knowledge, followed by analysis thinking skills and problem-solving. The less important skill was a skill in innovation creation using science, mathematics, technologies, and engineering process. This was consistent with the research of Pornchai Jedaman et al. (2016) stating that the development of humans and the change of mindset of generation Z to have more skills were more important than the content. Moreover, the learning process was more crucial than the curriculum, and the framework was unnecessary. Knowledge should be integrated into life. Utilization, creativity, analysis and synthesis skills were more important than recitation whereas technologies were more helpful for learning and development than learning in the classroom. 6Rs skills which were Reading (R), wRite, Relation Science, aRithematics, Relation Technology and Innovation, and Relation Quality was not sufficient and skills of the 21st Century should be created such as Leadership, Digital Literacy, Communication, Emotional Intelligence, Entrepreneurship, Global citizen, Problem Solving, and Teamwork.

2. Regarding self-adjustment, the respondents gave importance to the adjustment at a moderate level. They gave the highest importance to answering questions using information as a reference and suggesting a practical solution, followed by new unique and acceptable creativity. They gave less importance to the appropriate mathematics knowledge application. This was in line with Kriangsak Chareonwongsak (Online, 2016) who stated that the learning system should help to upgrade education quality, skills should be able to construct the learners with required potential, and support innovative thinking and self-reliance on technology. Further, it was consistent with Panida Arwut (2011) who studied the satisfaction of supervisors, colleagues, and qualified trainees towards work performance of Class 15 Nurse Practitioners (Primary Medical Care) at Boromarajonani College of Nursing Suratthani. Her findings revealed that the overall satisfaction of the supervisors and colleagues towards the work performance of Class 15 Nurse Practitioners (Primary Medical Care) at Boromarajonani College of Nursing Suratthani was at a high level. The most satisfying aspect was knowledge, followed by skills, attitude, behavior, and roles and responsibilities.

3. In regard to instructional activities, the respondents gave priority to this factor at a high level. The most important aspect was instructional activities outside the classroom and workshop, followed by activities related to daily routine by technologies. The less important factor was and instructional activities on projects and problem-solving. This was in harmony with Paitoon Sinlarat (2014)'s concepts which were: 1) The learner was able to apply knowledge to practice, 2) Be able to analyze and synthesize innovation to society, and 3) Have more awareness of being a producer than a consumer. Instructional activities planning should contain workshop activities rather than a lecture class. Moreover, activities should be variety and the learners were able to participate in activities and brainstorming and develop thinking process skills. Instructional activities should be flexible and independent from normal learning which gave an opportunity to the learners to create an applicable learning performance. Besides, it was in line with Thanetphol Charoenrat (2016) who examined the expectation and actual perception of the students on the quality of instructional

planning for Bachelor of Education Program in English, Faculty of Education, Sakonnakhon Rajabhat University. He found out that the highest expectation of the students was on professional training (4.51), followed by the instructors (4.40), and instructional planning (4.35) respectively. The result indicated that gender and learning performance had no impact on the expectation with significance. Further, the result showed that the highest actual perception of the students was on the training (4.16), followed by the instructors (3.95), and instructional planning (3.92), which illustrated that gender and learning performance did not have an impact on the actual perception with significance.

4. Regarding knowledge about Thailand 4.0, the respondents gave significance to this factor at a high level. The most important aspect was the knowledge of access and search for more information from digital media and the internet, followed by knowledge and understanding about the problem, and finding a creative solution. The less important aspect was knowledge about creating a cluster, technologies, and innovation. This was consistent with the concept presented in Manager Online (Online, 2017) stating that Thailand 4.0 was the policy vision for Thailand Economic Development or Economic Development Model proposed by the government under the lead of General Prayut Chan-o-cha, the Prime Minister and Head of the National Council for Peace and Order (NCPO) under the vision "Security, Wealth, and Sustainability". The main mission was to drive the reform in various aspects to improve, systematize, redirect, and develop the country to deal with the sudden change of opportunities and threats in the 21st Century. Furthermore, it was consistent with the study of Wannapha Chomban (2018) examining Thailand 4.0 instructional planning for Thai children. She found out that Thailand 4.0 instructional planning for Thai children to construct learning emphasized on the learners to have a chance to research and learn with various learnings based on the learners and problems. This would allow the learners to participate in the learning activities continuously. Moreover, they would be able to have holistic working skills, be responsible for work, communicate, transfer the idea through study and discussion, and give reasons and opinions. Moreover, the learners could build attitude and creativity, resolve problems in various situations, and create innovation to respond to society and community. The study proposed the

five crucial aspects which were: 1) Thailand 4.0 instructional planning for Thai children, 2) learning in Thailand 4.0, 3) roles of instructors and learners, 4) guidelines for Thailand 4.0 instructional planning, and 5) relation of Thailand 4.0 instructional planning. The researcher truly hopes that it would be useful and applicable for Thai education in the future.

RECOMMENDATIONS

1. The faculty should develop students' skills by teaching English.

2. The instructors should adjust themselves towards the Thailand 4.0. They should assign students randomly in groups, so that the students can make new friends.

3. Creating classroom environment by bringing technology into lessons can promote students' motivation to learn because it can make the process of learning more interesting and fun.

4. The faculties should call for students meeting to understand more about Thailand 4.0, so they can apply knowledge among themselves.

Research recommendation and futher research

1. The universities need to provide learning activities that involves students in thinking and doing activities. The students will be able to create their own knowledge through the process of creative integration, and the adoption of innovation that responds to human needs.

2. This study research only focuses on the undergraduate students' perceptions in public universities; not private universities or colleges.

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