

The Study of Information, Media, and Technology Competencies for Undergraduate Students according to 21st Century Learning Framework

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Abstract - The purposes of the study were to: (1) synthesize the information, media, and technology competencies for undergraduate students according to 21st century learning framework, (2) design the indicators of information, media, and technology competencies for undergraduate students according to 21st century learning framework, and (3) study the students' opinion on the information, media, and technology competencies for undergraduate students according to 21st century learning framework. The samples were seven experts and thirty-six undergraduates, selected by purposive sampling. The research methodology divided into three main phases: (1) Synthesize the information, media, and technology competencies, (2) Design the indicators and questionnaire, and (3) Study of students' opinion on their use of information, media, and technology competencies for undergraduate students according to 21st Century Learning Framework. The instruments used for gathering data were: (1) the evaluation form of the experts for Index of consistency (IOC), (2) the competencies form according to 21st century learning framework, and (3) the opinion form of the students for

information, media, and technology competencies. The data were: analyzed by using Index of Consistency (IOC), mean (\bar{x}) and standard deviation (S.D.). The research findings were as follows: (1) The information, media, and technology competencies can be divided into three areas: (1) Knowledge; (2) Skills; and (3) Attitude, (2) The indicators can be divided into three areas as follows: (1) Knowledge has eleven primary indicators; (2) Skills have three primary indicators; and (3) Attitude has eight primary indicators, and (3) the students' opinion showed as follows: (1) The students' opinion on their knowledge of the information, media, and technology competencies according for undergraduate student standards has a significant impact to their competencies at a very high level ($\bar{x} = 4.56$, S.D. = 0.68), (2) Students' feedback on their overall skills of information, media, and technology competencies according to undergraduate students' standard that have a significant impact according to different aspects at a high level ($\bar{x} = 4.33$, S.D. = 0.74), and (3) Students' opinion on the attitude that is most significant for information, media, and

technology competencies at a very high level ($\bar{x} = 4.95$, S.D. = 0.22).

Keywords - Competency, Information, Media, and Technology Skills, 21st Century Learning Framework

I. INTRODUCTION

Education in the 21st century has changed from the past. Specifically, 21st century education mainly focuses towards skill development, critical thinking, and personal reflection through the form of media and information technology. In effect, this form of education provides extensive opportunities for students to develop skills according to their own interests, without restrictions of time and place. Therefore, education in the 21st century has developed better educational quality leading to qualified graduates in workforce.

The Office of Higher Education Commission has stated the qualification for Bachelor Degree graduates to have: (1) Moral, (2) Knowledge, (3) Intellectual Skills, (4) Interpersonal Relationships and Responsibilities, and (5) Numerical analysis, Communications, and Information Technology. The standard of learning skills in Numerical Analysis, Communications, and Information Technology aspect states that graduates must be able to understand Mathematical or Statistical Techniques appropriately involved in their work studies and propose ways to resolve them. Furthermore, they should be able to make use of information technology in data collection, processing, and interpretation. They should also be able to present these figures in quality manner of spoken and written communication [15].

Consistent learning framework is essential for youth development in the 21st century regarding to skills within information, media, and technology skills [6]. The skills for the information, media, and technology skills will require: (1) Information literacy, including accessing and evaluating information and management of information, (2) Media literacy, including the ability to analyze media

and produce creative media, and (3) Basic knowledge of Information and Communication Technologies (ICT Literacy) in appropriately using Technology Communication [6].

Therefore, information, media, and technology competencies are crucially significant and applicable for undergraduate students today. In order to further improve the process of teaching and training to enhance students' competency, incorporating a more applied and skill-based teaching will be necessary to devote career development within information technology.

II. OBJECTIVES OF THE STUDY

1. To synthesize the information, media, and technology competencies for undergraduate students according to 21st century learning framework.

2. To design the indicators of information, media, and technology competencies for undergraduate students according to 21st century learning framework.

3. To study the students' opinion on information, media, and technology competencies for undergraduate students according to 21st century learning framework.

III. METHODOLOGY OF THE STUDY

The study was divided into three main phases:

1. **Phase One:** Synthesizing the information, media, and technology usage competencies were been collected from the concept of 21st century university student education teaching and research-related documents, which mainly consist of: (1) Document Analysis and Research Competency, (2) Analysis of learning outcomes of undergraduate qualifications in terms of numerical analysis skills, communication, and information technology according to the Office of the Higher Education Commission (OHEC), (3) Document Analysis and Research in terms of information, media, and technology according to framework of the 21st century, and (4)

Synthesize of information, media, and technology competencies, which are divided into three areas: (1) Knowledge, (2) Skills, and (3) Attitude.

2. Phase Two: Designing the indicators using information, media, and technology among university students within the framework of 21st century learning was conducted through questionnaire, which offers an expert verification on the content validity. In order to assess the consistency of the questionnaire, the scores were analyzed, reviewed, and revised according to the advice of experts.

3. Phase Three: The study of students' opinion on the use of information, media, and technology among university students in the 21st century framework was conducted through research questionnaires in sampling thirty-six undergraduates majoring in Information Technology at Surindra Rajabhat University. The formula applied to calculate the sample table was Krejcie and Morgan (Krejcie & Morgan, 1970) incorporated with online questionnaires, evaluation, and analysis of data by mean (\bar{x}) and standard deviation (S.D.).

IV. RESULTS OF THE STUDY

The research results in the study of information, media, and technology competencies for undergraduate students showed that:

1. The results in conducting the research for the information, media, and technology competencies according to 21st century learning framework is found accordingly:

- The meaning of the academic competency in Thailand and abroad is determined by the ability of the knowledge, skills (competencies observed), attitude (competencies hidden in a person) so personal attributes needed for work to achieve a higher standard.

- The results of the study shows that the learning outcomes of undergraduate

qualifications including skills, numerical analysis, communication, and information technologies according to the Office of the Higher Education Commission (OHEC) [15] in the 21st century learning framework [6] is able to synthesize and interpret the use of information, media, and technology consistently. The learning outcomes of these undergraduate students exemplify that the 21st century learning framework is appropriate achieving all the outcomes state in having a basic knowledge of information and is able to use information technology in data collection, processing, and interpretation. In addition, they are also to understand basic media fundamentals, such as ICT, at a high quality in both spoken and written interpretation. For this reason, they will be able to project these skills to the workforce according to the present day technological-intensive working environment that is extensively progressing towards the future.

2. The design of the competency indicator in assessing information, media, and technology competencies for undergraduate students according to the 21st century learning framework is divided into three main areas: (1) Competency in information and media literacy by having a basic knowledge in having access to information is a key quality. Furthermore, to understand how to use the media and approach media professionals to achieve certain objective is also essential. Appropriately being able to apply existing technology to be used for communication and networking can achieve this. Thus, the ability to evaluate diverse information must be achieved according to the eleven primary indicators, (2) The individual's competencies in projecting information, media, and technology skills in media productions to meet the desired objectives and respond to different types of individuals. Moreover, applying information management creatively and consistently by using technology, as a tool in research is also critical. This is mainly done through the area of enterprise management, assessment, and communication of information focused within the three primary indicators, and (3) Enhanced use of information, media, and technology knowledge by being of

information, media, information and communication technology in a way that is ethical and legally right according to the eight main indicators are as shown in 3.

3. The research in students' opinion on their use of information, media, and technology according to the 21st century learning framework is detailed below:

- The students' opinion on their knowledge of the information, media, and technology competencies according to undergraduate student standards has a significant impact to their competencies at a very high level ($\bar{x}= 4.56$, S.D.= 0.68), considering from different aspects show that: (1) Knowledge in using computers, laptops, and smart phones are most significant ($\bar{x}= 4.56$, S.D.= 0.68); (1.1) Knowledge in using computers with different operating system such as Windows, Mac OS ($\bar{x}= 4.40$, S.D.= 0.55); (1.2) Knowledge in using different operating system for laptops and smart phones such as Android, IOS, Windows Phone ($\bar{x}= 4.40$, S.D.= 0.55); (1.3) Knowledge in using mobile phone as storage system or communications effectively, such as taking pictures, videos, or movies ($\bar{x}= 4.60$, S.D.= 0.55); (1.4) Knowledge in media production such as movie production or snapshots ($\bar{x}= 4.60$, S.D.= 0.89); and (1.5) Knowledge in distributing digital medias through technological methods (Sending files to others) such as sharing media on Facebook ($\bar{x}= 4.80$, S.D.= 0.45), (2) Knowledge is media and technological communication is significantly crucial ($\bar{x}= 4.80$, S.D.= 0.45), (3) Knowledge in using different programs is also significant ($\bar{x}= 4.36$, S.D.= 0.86); (3.1) Word Processor Programs such as Microsoft Word ($\bar{x}= 5.00$, S.D.= 0.00); (3.2) Presentation Program such as PowerPoint ($\bar{x}= 4.60$, S.D.= 0.89); (3.3) Spread Sheet Program such as Excel ($\bar{x}= 4.60$, S.D.= 0.89); (3.4) Database Management System such as Access, MySQL, and Oracle ($\bar{x}= 3.80$, S.D.= 0.84); (3.5) Statistical Programs such as SPSS ($\bar{x}= 3.80$,

S.D.= 0.84), (4) Web Browser such as Internet Explorer, Mozilla Firefox, Google Chrome, Safari ($\bar{x}= 3.80$, S.D.= 0.84), (5) Electronic Mail such as Gmail, Hotmail, Yahoo or E-Mail ($\bar{x}= 4.80$, S.D.= 0.45), (6) Knowledge and applications in using social networks such as Facebook, Line, Twitter, and Instagram ($\bar{x}= 4.80$, S.D.= 0.45), (7) Search Engine Competency such as searching through Google, Yahoo ($\bar{x}= 4.80$, S.D.= 0.45), (8) Utility Programs Competency such as Acrobat Reader, Windows Media Player, Nero, WinZip, and WinRAR ($\bar{x}= 4.40$, S.D.= 0.89), (9) Media Advertisement through Internet or effective online communication, such as giving criticism online ($\bar{x}= 4.80$, S.D.= 0.45), (10) Creative Media Designs Programs ($\bar{x}= 4.80$, S.D.= 0.45), and (11) Using technology appropriately by not creating harm to others ($\bar{x}= 5.00$, S.D.= 0.00).

- Students' feedback on their overall skills of information, media, and technology competencies according to undergraduate students' standard that have a significant impact according to different aspects at a high level ($\bar{x}= 4.33$, S.D.= 0.74) include: (1) Skills in specializing technology through appropriate media forms (PC, Laptops, or Smart Phones) ($\bar{x}= 4.23$, S.D.= 0.77); (1.1) Ability to have access to WiFi in order to link with the Internet ($\bar{x}= 4.60$, S.D.= 0.55); (1.2) Ability to have access to Bluetooth in order to distribute or send media files ($\bar{x}= 3.60$, S.D.= 0.89); (1.3) Having ability to produce media files such as E-Card ($\bar{x}= 4.40$, S.D.= 0.89); (1.4) Ability to use statistical programs such as SPSS to analyze data ($\bar{x}= 3.80$, S.D.= 0.84); (1.5) Ability to use social networks as a platform for educational or business purposes, such as online advertisements or promotion ($\bar{x}= 4.40$, S.D.= 0.55); and (1.6) Search Engine ability such as researching for information ($\bar{x}= 4.60$, S.D.= 0.55), (2) Being able to maintain and care for technological equipments such as computers, laptops, and smartphones ($\bar{x}= 4.60$, S.D.= 0.55), and (3) Ability to evaluate

trustworthy information and analyze information that are not appropriate to use as reference ($\bar{x} = 4.80$, S.D.= 0.45).

- Students' opinion on the attitude that is most significant for information, media, and technology competencies at a very high level ($\bar{x} = 4.95$, S.D.= 0.22) the results show that: (1) Hearing other people's idea and being able to understand them ($\bar{x} = 5.00$, S.D.= 0.00), (2) Having positive intentions when using online information technology and media ($\bar{x} = 4.80$, S.D.= 0.45), (3) Have the intention to solve information technology problems effectively ($\bar{x} = 4.80$, S.D.= 0.45), (4) Have high level of interest in new technology and keeping up-to-date with modern trends ($\bar{x} = 5.00$, S.D.= 0.00), (5) Respect technology according to their use and purpose ($\bar{x} = 5.00$, S.D.= 0.00), (6) Hold responsible for actions done through media online ($\bar{x} = 5.00$, S.D.= 0.00), (7) Use technology appropriately and ethically without harming others ($\bar{x} = 5.00$, S.D.= 0.00), and (8) Has to mindset of valuing technology and not take it for granted ($\bar{x} = 5.00$, S.D.= 0.00).

V. CONCLUSIONS AND DISCUSSIONS

In conclusion, the research in information, media, and technology competencies for undergraduate students according to 21st century learning framework show that: (1) Enhanced use of information and media literacy is a basic skill that every student should be able to know how to use. In addition, applying existing technology for communication and networking, as well as being able to evaluating the diverse information effectively is crucial, (2) The basic skills of information, media, and technology in media production to achieve objectives and respond to different types of individuals is also important. Specifically, being able to apply information management creatively and consistently. Furthermore, applying technology as a tool in research, within enterprise management, assessment, and communication of information, and (3) Using information, media, and technology

skills appropriately and being aware that it is unethical to use it illegally. The research found that the competencies of students in using information, media, and technology are mainly focused towards their attitude and knowledge, and performance in using day-to-day technology. As a result, their competencies in using information, media, and technology are highly dependent towards the way they are able to interpret these skills, which mainly consist within their attitude, knowledge, and overall skills. This, in effect, will effectively and consistently enhance their skills and competencies according to the 21st century learning framework.

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(Arranged in the order of citation in the same fashion as the case of Footnotes.)

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