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## Integration of Information Literacy Skills with Mechanical Vibration Subject

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### Abstract

Studying in mechanical engineering course in Thailand, students had to study a mechanical vibration subject which concerned in mathematics and engineering dynamic theory. Many mechanical engineering students of Srinakharinwirot University (SWU) could not pass an examination because they could not understand obviously in the theories and could not imagine problems in mechanical vibration.

This research was aimed to develop the information literacy skill in the students in order to help learning in mechanical vibration course and to compare achievement of both before and after learning of mechanical engineering students of SWU. In addition, this research also study of the lesson understanding of students. The sample subjects were 40 students who enrolled in this course in the second semester of academic year 2014. The research tools were achievement tests and satisfactory self-assessment form. The result showed that the academic achievement of the students after using the lesson was higher than that before learning at the score of Mean 4.28 and Standard Deviation 0.55. The result of satisfaction of the self-assessment form was in high level that indicate the most satisfaction was the number 6: the activities encourage learning of students.

**Keywords:** Mechanical Vibration, Classroom Research, Information Literacy Skills, Satisfaction.

### 1. INTRODUCTION

Information literacy is associated with the education which students seem to be the center of the learning process by using information technology in order to assist in teaching. It is important to make the students know the academic content correctly, see the image clearly and understand the content in a short time. Additionally, the current information has played an important role to daily life dramatically including education, economy, society and politics. As a result, it is known as the information age society progress, information technology and telecommunication system which boosts the manufacture and uses information continuously and quickly. Also, individuals must adapt themselves for the environment change to expand their knowledge and use information technology as a tool in order to solve and determine the problem. Thus, Information literacy is important for this change.

Having the knowledge of information technology and applying it properly as well as learning activities with a variety of media or innovation can encourage the students' motivation; create their skill and ability with limitless imagination. What's more, information technology allows the students to choose their schedule and topic of training themselves. This would increase their skills and experiences more up-to-date as recently the term of education has changed especially in the 21<sup>st</sup> era that brings technology to develop the learning system to be more powerful. Moreover, new engineers are expected to understand Engineering profession role impacting society, economics and environment. [1] – [6]

Therefore, students who have better skills of information literacy can search useful data easily and quickly and help learning in engineering. In order to have better achievement and to improve the teaching

activities, researchers have therefore used the technique of integrated information literacy skills combined with knowledge of mechanical vibration and develop instructional activities.

### 2. METHODOLOGY

#### 2.1 Scope and instruments used in this research.

The population used in this research is that third year undergraduate students in Mechanical Engineering, Faculty of Engineering, Srinakharinwirot University overall 40 people. The sample is the group of students who study Mechanical Vibration in the second semester /2014.

#### 2.2 Research Instruments.

The tools which are used in this research are as per following details:

1. The media and Lesson Plan
2. The lesson of integrated information technology skills related to mechanical vibration-list.
3. The learning test based on content and learning objectives.
4. The questionnaire of students' satisfaction conducted after learning the integrated information literacy skills can be divided to 3 sections as

Part 1: General information of respondents

Part 2: The questionnaire of students' satisfaction conducted after learning the integrated information literacy skills using the 5 Rating Scale of Likert which can define the criteria as.

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Table.1 Result from the survey.

score	Meaning
5	Highest, Most important
4	High, Important
3	Average
2	Low, Less important
1	Lowest, Least important

Part 3: Additional Suggestions.

### 2.3 Research Procedure.

In this research we have conducted the procedure as per following:

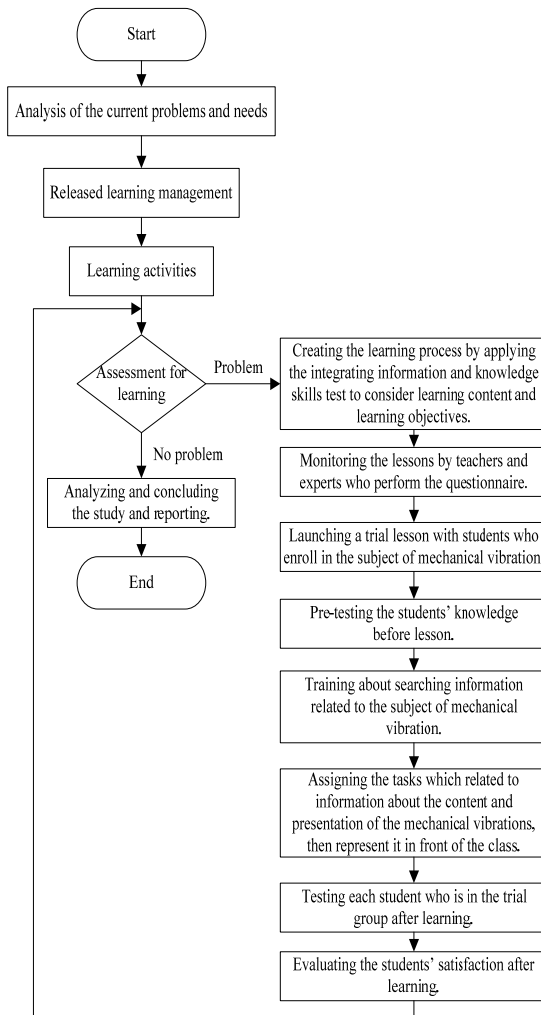


Fig. 1 Flow chart of research to improve learning.

### 2.4 Experiment and Data Collection.

The data collection took 1 semester as it was in the second semester/2014 from November 2014 to February 2015. The operations of data collection defined as following:

1. The data was collected by the researchers from the students before having lesson. The students were

given a test then the result was recorded by researchers.

2. The integrating information literacy lessons which related to the Mechanical Vibration were taught and taken for 2 weeks (3 hours per week to a total of 6 hours).
3. After the lessons, the students were given the test again and researchers created the file, and then save the result.
4. Allow the students perform a satisfaction questionnaire to give the comment.

### 2.5 Interpretation of Mean.

The data analysis of Mean was used to analyze the problems which related to the mechanical vibration between pre-test and post-test. The learning techniques of integrating information literacy skills combined with knowledge of the mechanical properties Statistics such as Mean (Eq. (1)) and Standard Deviation (Eq. (2)) and the Mean Deviation of Students' satisfaction from Likert Scale.

average	4.51-5.0	is	Highest, Most important
average	3.51-4.50	is	High, Important
average	2.51-3.50	is	Average
average	1.51-2.50	is	Low, Less important
average	1.00-1.50	is	Lowest, Least important

The data analysis research development group in a class by learning together with the distribution of data using statistical analysis.

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} \quad (1)$$

Mean:

$\bar{x}$  is Mean of all data

$x_i$  is Data

$n$  is Number of data

$$S.D. = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}} \quad (2)$$

Standard Deviation:

S.D. is Standard Deviation

$\bar{x}$  is Mean of all data

$x_i$  is Data

$n$  is Number of data

## 3. RESULTS AND DISCUSSION

The research can be summarized as following:

1. The result of the learning achievement by using technique of integrating information literacy skills course in mechanical vibration illustrated that the Mean of technique integrating information literacy instruction was higher than the Mean of the lecture technique.

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Table.2 Result from the survey.

Recruitment Category	Average Score	Standard Deviation	Meaning
Personality	4.33	0.69	Most important
Attitudes	3.88	0.79	Important
Background	3.49	0.92	Important
Experience	2.68	0.57	Average
Computer Skills	3.22	0.88	Average

For first week of learning, researcher asked the information about personality and attitudes of students, background and experience in mechanical vibration and computer skills which were necessary for searching important information about vibration theory. [7]

Table.3 demonstrates the comparing results of learning between lecture technique and the combining techniques of integrating information literacy skills and learning.

How to learn	n	$\bar{x}$	S.D.
Lectures	40	3.88	0.53
Integration of Information Literacy Skills	40	4.28	0.55

2. The evaluation form of students' satisfaction on learning with merging technique between integrating information literacy skills and teaching by using statistics such as Mean ( $\bar{x}$ ) and standard deviation (S.D.) was displayed in table 3 and 4. The result indicated the overall satisfaction that the students who were learning with merging technique in the course of mechanical vibration showed most levels of satisfaction in both stimulating learning and the opportunity to ask and benefit from this activity.

Table.4 demonstrates the students' satisfaction on combining learning technique of integrating information literacy skills.

Topics	$\bar{x}$	S.D.	Meaning
1.The attraction of activities	4.18	0.59	High
2.The responsiveness of activities to the objective	4.15	0.48	High
3.The creation and view to the students	4.33	0.57	High
4.The activity can stimulate the students for self-	3.93	0.57	High

learning			
5.The benefits from the activities	4.03	0.57	High
6.The pattern of activity can encourage the students to do or search information	4.78	0.42	Highest
7.The opportunity for asking or query	4.38	0.76	High
Topics	$\bar{x}$	S.D.	Meaning
8. The suitability of activities to use in all subjects	3.85	0.53	High
9. The Activities can promote the better learning	4.83	0.44	Highest
10. The Suitability of learning process	4.38	0.62	High

### 3. Additional suggestions from students

1. This activity helps students who are rarely interested in listening to the teacher to be more interested in studying.
2. The students who were chosen to represent in front of others can explain but not clear enough as the teacher explain. On the other hand, if the teacher both explain and give an opportunity to students to ask and answer the questions that would make the students be more understandable.
3. There should be regular activities to help the students finding the useful information.
4. It is a very good activity which allows the students use their idea first before the teacher showing the answer.
5. It encourages some students who do not dare to ask questions become more and more courageous.
6. Some students stated that it was too long.

### 4. CONCLUSIONS

The research from the classroom can give an overall of learning pattern with integrating information literacy skills technique in mechanical vibration. It is found that students could earn more concentration and satisfaction. Students could be more participate in the class and solve problems by themselves as well as can

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do as teamwork. This activity allows the students to exchange knowledge from others whereas the teachers can only share and suggest guidelines for how to solve the problem and give the right answer. As soon as the students get the right answer, they will be more confident to present to other friends in front of the class. Thus, this can lead the achievement of the knowledge and research in mechanical vibration assignments and instructors which explain more questions and presenting in order to assess their understanding of students.

According to the teaching technique combining of integrating information literacy skills, it allows the teachers develop their teaching technique to be more suitable with the real situations and to encourage the students discovering the new innovation related to mechanical vibration. Therefore, the lecturer must study problems before assigning student to do research.

### 5. ACKNOWLEDGEMENT

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### 6. REFERENCES

- [1] Baykaycom, S. *Information Literacy Skills of Bachelor Degree Students*, Master Degree Thesis, Kasetsart University.
- [2] Cruz, J., (2007). Education Accreditation System in US. *The 5 National Conference of Engineering Education Proceedings, USA*.
- [3] Jamyuon, N. and Jamyuon, S. (2014). Development in classroom research by using a group study strategy. *The 12<sup>th</sup> International and National Conference of Engineering Education (INCEE-12), Thailand*.
- [4] Lang, J.D., Cruise, S., McVey, F.D. and McMasters, J. (1999). Industry expectations of new engineers: A survey to assist curriculum designers, *Journal of Engineering Education*, 88,1, pp. 43-51.
- [5] Leepatanapan, S., (1998). An Industrial Needs Driven Manufacturing Curriculum in Thailand. *Manufacturing Education for the 21 Century. Volume V, Manufacturing Education for Excellence in the Global Economy*. Society of Manufacturing Engineers. USA.
- [6] Poolsuko, P. and Kuptasthien, N. *Industrial Engineer Qualifications Needed by Industrial Sector and Curriculum Development Direction for the Year of 2009-2013*, Master Degree Thesis, Rajamangala University of Technology Thanyaburi.
- [7] Son-art, N., Tungonejareun J. and Jarungpornasawat, O. (2014). Improving Teaching Effectiveness in course of Illumination Engineering by Teaching Strategies. *The 12<sup>th</sup> International and National Conference of Engineering Education (INCEE-12), Thailand*.