SIMULATOR PROGRAMS (2-D AND 3-D): INFLUENCE ON LEARNING PROCESS OF BSMT AND BSMAR-E STUDENTS AT MARITIME UNIVERSITY PHILIPPINES

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ABSTRACT

This study aims to determine the 2-dimensional and 3-dimensional simulator programs and their influence on the learning process of BS Maritime Transportation and BS Marine Engineering students at Maritime University, Philippines. The participants in this study were the 160 BSMT and BSMar-E students of the Maritime University (JBLFMU-Molo) for school year 2010-2011. Participants in the study were enrolled at the Deck Simulator Program and Engine Room Simulator (ERS), which introduced the 2-D and 3-D simulator programs as part of the different tasks for skills development of maritime students (BSMT and BSMar-E) at Maritime University in the Philippines. The researchers instructed the respondents to write down all their comments, suggestions, observations, and remarks on the perceived influence of using the 3D and 2D simulator programs. After the gathering of the qualitative information, the researchers classified and categorized the write-ups of the respondents into different "categories." The analysis of comparison in relation to learning process brought about by the two (2) simulator programs was processed by the researchers. The "categories" were used towards establishing the concepts/views whether these simulation programs influence the learning process of nautical (BSMT) and marine engineering (BSMar-E) students at Maritime University (JBLFMU-Molo) in the Philippines. The results revealed that the 2-D and 3-D simulator programs are good learning aids which are helpful to marine engineering students. Sustaining the marine engineering students' "competent skill" in performing the different tasks in simulator is needed and should be enhanced.

Keywords: *2-D simulator program, 3-D simulator program, learning process, BSMT, BSMar-E.*

1. INTRODUCTION

Video tapes, computer simulations, and multimedia software can encourage the students to think like scientists (Brungart & Zollman, 1996). This kind of instructional technology stimulates students to learn and to like their subject (Harwood & Mc Mahon, 1997; Sumanpan, 2008) even though it seemed difficult to understand. These software and technological-instruction activities can facilitate the learning process, more likely to those students who are interested in manipulation and skills. The instructors in higher education institutions should be innovative and creative in dealing with students in order to convey and translate their ideas to achieve effective learning process.

Studies in the field revealed that simulation activity offers education providers a significant educational tool to meet the needs of today's learners by providing them with interactive and practice-based, instructional technologies. Using simulations in teaching and testing has the following potentials that can enhance the total learning process: more effectively utilize faculty in teaching of basic engineering skills, allow learner to revisit his skill in the simulator a number of times in an environment that is safe, non-teaching and conducive to learning, actively engage students in their learning process where they can display higher-order of learning rather than simply mimicking the teacher role model, contribute to the refinement of the body of knowledge related to the use of simulation in maritime education by providing insights in order to formulate best practices related to design and use of simulation technology (Tumala, Trompeta, Evidente, & Montaño, 2008). Furthermore, the authors underscored the use of virtual environment for instructional use in relation with the learners' characteristics. In this study, the authors stressed that learners benefited from the use of simulator as a learning tool irrespective of the type of cognition. In the same vein, the authors have found out the role of the learning program as an indicator of successful learning that now depended on simulation itself. The need to join hands in coming up with programs and program designs that will best cater to the desired learning outcomes of the learners is well stated in this particular study.

The key issue in successful application of simulator classes is ensuring that simulation serves its purpose. The primary aim of any simulator experience is to create a certain level of skills performance among students. In the study entitled "Attitude, Skills Performance, and Implications of using Simulators among Marine Engineering Students of JBLFMU-Molo, Iloilo City, Philippines" conducted by Alimen, Ortega, Jaleco, & Pador (2009), it was emphasized the following: students do not seem to be sold completely to the use of simulator as indicated by "moderately positive attitude" towards simulator use, sustaining the marine engineering students' 'competent skill' in performing the different tasks in simulator is needed and it should likewise be enhanced, the significant correlation between the attitude and skill performance in simulator is reinforced by several studies which support the relationship between learner attitude and their performance. It is also stated that technology has been apparent in this regard as it has reached a threshold where virtual or simulated approaches can meet or exceed the learning outcomes of

expository (teacher-centered) approaches, the implications suggested that simulator should consist, more than anything else, of a set of updated and upgraded computer software to address the observations and comments from the students.

2. STATEMENT OF THE PROBLEM

The present study aimed to determine the use of 3D and 2D simulator programs and its influence on the learning process of nautical (BSMT) and marine engineering (BSMar-E) students at the Maritime University (JBLFMU) in the Philippines.

To further understand the study, the following questions were advanced:

(1) How do marine engineering students perceive the 3D and 2D simulator programs in terms of learning at the maritime university?

(2) What are the comments, suggestions, and remarks about the 2D simulator program of nautical and marine engineering students?

(3) What are the common remarks and suggestions of the nautical and marine engineering students related to the 3D simulator program?

(4) Which are the perceived 2D and 3D simulator influences in the learning process of the nautical and marine engineering students?

3. THEORETICAL FRAMEWORK

The present study was anchored on the theory advocated by Alimen, Ortega, Jaleco, & Pador (2010) in their study entitled "Attitudes, Skills Performance, and Implications of Using Simulator Programs among Marine Engineering Students of JBLFMU-Molo" by employing descriptive-qualitative mode of data collection. Moreover, in terms of the qualitative study, Yamut (2008) employed a series of descriptions and information to determine the theme, characteristics, opinions, reflections, and views of the subject of the study. In this study, the researchers allowed the respondents to express their ideas, opinions, and views on 2-D and 3-D simulation programs and their influences on the learning process of marine engineering students at the Maritime University in the Philippines.

4. CONCEPTUAL FRAMEWORK

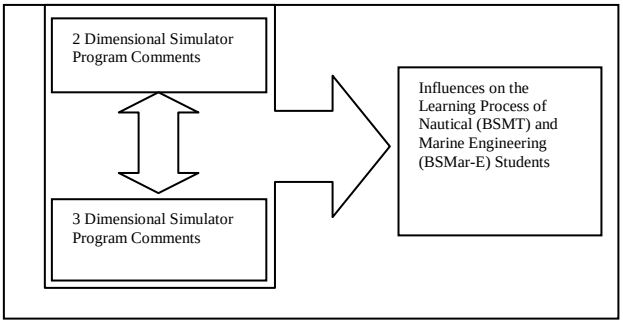

Figure 1 2D and 3D simulator programs and their influences on the learning process of nautical and marine engineering students

5. METHOD

This study used the descriptive research design. The respondents of the study were the nautical (BSMT) and marine engineering (BSMar-E) students at Maritime University (JBLFMU) who were using the 3D and 2D simulator programs. The research process involves the description, interpretation, and comparison of the comments, suggestions, and remarks of marine engineering students on simulator programs at the Maritime University.

6. PARTICIPANTS

The participants in this study were the 180 nautical (BSMT) and marine engineering (BSMar-E) students of the Maritime University (JBLFMU) for the academic year 2010-2011. Participants in the study were familiar with Deck Simulator and Engine Room Simulator (ERS), which includes the 2D and 3D simulator programs as part of the different tasks for skills development of nautical and marine engineering students at Maritime University (JBLFMU) in the Philippines.

7. PROCEDURE

The researchers instructed the respondents to write down all their comments, suggestions, observations, and remarks on the perceived influence of using the 3D and 2D simulator programs. After the gathering the qualitative information, the researchers classified and categorized the write-ups of the respondents into different "categories." The analysis of comparison in relation to the learning process brought about by the two (2) simulator programs was processed by the researchers. The "categories" were used towards establishing the concepts/views whether these simulation programs influence the learning process of nautical (BSMT) and marine engineering (BSMar-E) students at Maritime University (JBLFMU) in the Philippines.

8. RESULTS AND DISCUSSION

This section of the study focuses on the results and discussion about 2D and 3D simulator programs and their influences on the learning process of marine engineering students at Maritime University (JBLFMU-Molo) in the Philippines.

Table 1 Perceived Influences of 2D and 3D Simulator programs on the Marine Engineering Students Learning Process at JBLFMU-Molo

*2D and 3D programmes are educational and can be used for learning in BS Marine Engineering; *More computers should be available for 2D and 3D so that learning would be more efficient; *2D and 3D simulator programs are good learning aids which are helpful to marine engineering students *The 2D and 3D simulator programs are helpful in terms of improving and adding to students' learning; *They are very useful for the students to familiarize with the different parts of machines and equipment on-board;

*Extend the number of hours on 2D and 3D simulator programs in order to enhance the knowledge and skills of marine engineering students;
*2D and 3D simulator programs are suitable in the learning process of marine engineering students.
*The 2D simulator program is beneficiary for the students towards shipboard visualization;
*it should be imposed to students as additional learning and must be prioritized among other subjects;
*add more units especially for those students finishing their bachelor degree;
*helpful to students;
*we suggest making it more realistic;
*make students familiarize with the systems on-board;
* it is easier to operate and easy to locate specific systems;
* it helps students to identify if a valve is open or closed;
*it is good but not so very good;
*some parts of the system are not working;
* I want to see that there is a fluid flowing to the pipes;
*The 2D simulator program shows how to operate the machineries on-board;
* It is easy to locate all the valves and machineries when you are operating it;
* the students must be acquainted first with how to use the machineries and they must be aware of the consequences when they failed to follow the correct procedure;
*2D simulator program helps a lot of students from JBLFMU-Molo as a learning material. It stimulates the real situation on-board a ship;
*to improve the 2D simulator program, it is necessary to let the students know how to use and maximize all the programs;
*it is a great help for us to learn because you could

*3D is more practical than 2D so therefore it should be given more attention;
*I prefer 3D to 2D because it is more challenging and it gives critical thinking opportunity to the students;
*The 3D set-up reflects the reality on-board that gives thorough learning to the marine engineering students;
*3D is slightly confusing and sometimes difficult to handle;
*3D seems real but the leaking system should be put into higher resolution to achieve more realistic view;
*3D simulator program is a state-of-the-art learning tool. It is a great opportunity for the students to experience real engine operation through virtual simulation;
*3D is a higher version of simulator program necessary to marine engineering students in terms of skill-development programs at JBLFMU-Molo, Iloilo City.

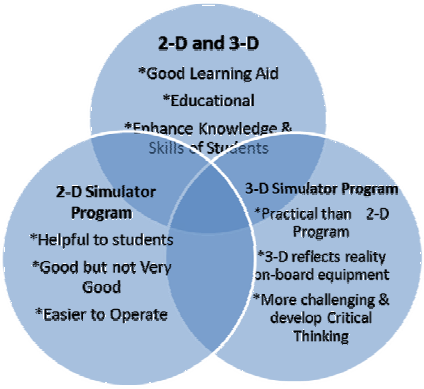

Figure 2 Summary of the views/insights of the nautical (BSMT) and marine engineering (BSMar-E) students towards 3D and 2D simulator programs

9. CONCLUSIONS AND RECOMMENDATIONS

The key issue in successful application of state-of-the-art simulator programs is the instruction to ensure that simulation serves its purpose. The primary aim of any simulator experience is to create a certain level of skills performance among students. In summary, this study has the following conclusions:

The 2D and 3D simulator programs are good learning aids which are helpful to marine engineering students. Sustaining the marine engineering students' "competent skill" in performing the different tasks in simulator is needed and should be enhanced.

These simulator programs are very useful to the students to familiarize with the different parts of the machinery and equipment on-board. It is also stated that technology has been apparent in this regard as it has reached a threshold where virtual or simulated approaches can meet or exceed the learning outcomes of expository (teacher-centered) approaches.

The implications found here suggest that the simulator should consist, more than anything else, of a set of updated and upgraded computer software and hardware to address the observations and comments of the students.

In this regard, the following are recommended:

(1) The findings of this study revealed that 2D and 3D simulator programs effectively enhanced the mastery of desired skills of the marine engineering students at JBLFMU-Molo, Iloilo City. Most of the students preferred the 3D simulator program, therefore, the administration should look into the advantages of the 3D simulator program to maximize the applicability of the program. More studies of this kind must be considered to further validate the results of this investigation.

(2) The lack of computers of the 3D simulator program must be addressed through a careful and periodic assessment of the simulation rooms where these courses will be conducted.

10. ACKNOWLEDGEMENTS

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