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Correlation between Year Level Assessment Result and Grades of Marine Engineering Students in their Major Subjects

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Abstract - *This research aimed to determine the relationship between year level assessment result and performance of marine engineering students in their major subjects. Specifically, it sought to present the year level assessment results of marine engineering students in the year 2015 - 2016. It also seeks to determine their performances in Basic Electricity, Engineering Materials, and Hand and Measuring tools, to test the significant relationship between year level assessment results and grades in their major subjects, and propose plan of actions base on the results of the study. This utilized a descriptive research method with the records of 66 marine engineering students. The results of the assessment showed that the marine engineering students scored the highest in Machine Shop 1 and scored the least in Engineering Materials. The Marine Engineering students got the highest grade in Basic Electricity and the least grade in Engineering Materials. The assessment on the course Machine Shop 1 was found correlated to the students' grades on Engineering Materials and Machine Shop 1. This indicates that there is a significant relationship between year level assessment results and grades. It is recommended that the maritime faculty members may develop plans to help students have better understanding of each and every lesson of a particular course especially the professional ones.*

Keywords - *Assessment results, grades, major courses*

INTRODUCTION

Students are being assessed to determine their current progress. By assessing them, the instructors will know on which subjects the students excelled or where the students had difficulties. Assessment is the process of gathering and discussing information from multiple and diverse sources, assessment, develops a deep understanding of what students know, understand, and can do with their knowledge as a result of their educational experiences; the process culminates when assessment results are used to improve after learning (Huba & Freed, 2000). Academic performance is one of the measures of student achievement that quantify the capability of the learner to do the activities or tasks as requirements for the fulfillment of a certain degree or course (Atienza et al., 2017).

Assessment must be planned with its purpose in mind. Assessment for, as and of learning all have a role to play in supporting and improving student's learning, and must be appropriately balanced. Interpretation and use of the information that is for its intended purpose is the most important part of assessment ("Role of assessment", n.d.). It is part of the outcome-based approach of teaching and learning where measurement of extent of knowledge, skills and values of the students could be determined from various tools and methods (Laguador & Dotong, 2014; Laguador, 2014; Laguador, 2013; Laguador & Dizon, 2013).

Year level assessment exam is basically used to evaluate the knowledge gain by marine students every year. This exam includes the minor and major subjects particularly the Engineering Materials which cover the basic knowledge of different materials, characteristics, properties, processes and metallurgy of metals used on board. Machine Shop 1 which covers the fundamental knowledge and basic skills in use of hand tools and operation of power tools, equipment and machinery and Basic Electricity which covers the fundamental concepts of electricity, electronics and other related sciences which have many applications on board, maintaining and troubleshooting the circuit board panel.

According to Peterson and Irving (2008), assessment is used for a number of reasons including individual documentation, innovation in teaching and response on the quality of teach. Every student has their own idea and interpretation on what assessment is. Brown and Hirschfield (2008) defined conception as

mental representations of phenomena in reality that explains difficult and complex categories of experience, such as assessment. It is defined as any act of interpreting information about student performance, collected through any of multitude of means.

Assessment affects cognitive and operant aspects of learning. The operant phase of learning concern when and how many students learn. Study has shown that the planning of exams and the examination rules are strong factors that impact to the operant learning (Schotanus, 2009). Lynch (2016) noted that some of the important intentions of assessment are to gather relevant information about student performance or progress, or to determine student interests to make judgments about their learning process. The effectiveness of a teacher and a school can be measured through assessment (Kelly, 2017).

Guerra (2007) works on the hypothesis that study habits relate to performance in English Plus of freshman maritime students of Lyceum International Maritime Academy of the Lyceum of Batangas. This study revealed that more than 50 percent of students did not obtain satisfactory ratings in the subject. The test of hypothesis proved that there was no significant difference between study habits and academic performance in English Plus. Of the six study habit dimensions, only listening proved to influence students' performance in English Plus.

It is conducted to determine the learning progress and skills acquisition. It must be applicable in the objectives of learning. It possesses the characteristics and qualification of being a marine engineering student. The results were posted on LIMA's bulletin board for convenience of the students. If someone does not belong in the list, it means they failed and need to retake the assessment. This assessment is a proof that the students are taking their studies seriously; if they passed and if they deserved the grades that they received after the semester.

Lyceum of International Maritime Academy (LIMA) conducted the initial year level assessment for the Maritime students for the school year 2015 - 2016. It is a retention requirement that is included in the retention policy of the university started that year. Based from the result, most of the marine engineering students passed the assessment on minor courses but they found difficulty on major courses especially on Engineering Materials.

That's why this study envisioned to provide basis on the progress in academic performances of the marine engineering students. The study will also help in determining where a student has deficient knowledge in a certain professional course. Whether in Basic Electricity (Electro 1), Engineering Materials (E-Mat), or in Hand and Measuring Tools (Machine Shop 1). The researchers indeed believe that this study will help in the formulation and revision of the curriculum as to improve the performances of the marine engineering community. This study will also help the instructors in a way that they will know on what specific course or topic they need to focus or put emphasis on so that students will be able to have full knowledge and understanding on that particular course.

OBJECTIVES OF THE STUDY

The study aimed to determine the relationship between the year level assessment result and their grades in their major subjects.

Specifically, it sought to present the year level assessment results of marine engineering students in the year 2015 - 2016. It also seeks to determine their performances in Basic Electricity, Engineering Materials, and Hand and Measuring tools, to test the significant relationship between year level assessment results and grades in their major subjects, and propose plan of actions base on the results of the study.

METHODS

Research Design

This study used mainly descriptive method of research with documentary analysis so as to describe completely the correlation between the year-end assessment of Marine Engineering students and their obtained grades in three major subjects Electro 1, Machine Shop 1 and Engineering Materials. Descriptive research describes what exists and may help to uncover new facts and meaning and is used to observe describe and document aspects of a situation as it naturally occurs (Polit & Hungler, 1999).

Procedure

The researchers used documents and records from the LIMA department to answer the objectives of the study. Data included the result of the year-end assessment of Marine Engineering students for the year 2015-16 and their grades in Basic Electricity, Hand and Measuring Tools and Engineering Materials, major subjects. It involves the record of sixty-six (66) first year marine engineering students who passed the exam that year.

A series of revisions and consultations to the instructor, the researchers sent a letter to the LIMA department in order to get the results of the year-end

assessment and grades in the three major subjects. The grades and the result of the assessment were then tabulated and submitted to the statistician to obtain the correlation.

Data Analysis

The needed data were tallied, encoded and interpreted using different statistical tools such as frequency distribution, mean and Chi – Square test. These tools were used based on the objectives of the study. In addition, all data were treated using statistical software, PASW version 18 to further analyze the result of the study.

RESULTS AND DISCUSSION

Table 1. Mean Distribution of the Respondent's Assessment Results on their Major Courses (N = 66)

Course	Mean	Qualitative Description	Rank
Electro 1	53.82	Passed (3.00)	2
E-mat	47.45	Failed (5.00)	3
Machine Shop 1	70.45	Passed (2.25)	1

Table1 presents the mean distribution of the respondent's assessment result on their major subjects. The data that can be seen on table 1 shows that among the subjects taken by marine engineering students, they got their highest assessment on the subject Machine Shop1 (70.45), followed by Electro1 (53.82) and then E-mat (47.45) respectively. It also shows that they passed on the courses Machine Shop 1 and Electro 1 only but they failed on the course E-mat. This indicates that the performance of marine engineering in the course E-mat is not good enough to meet the passing rate in that assessment.

The performance in E-mat was considered failed since E-mat is one of the courses that deals with mathematical thinking and critical thinking skills. Based from the interview conducted in some marine engineering students in LIMA, it is one of the hardest course they have taken in that semester. And one of the weak point of the students is about the mathematical skills.

This shows that the exam about the Machine Shop (Hand and Measuring Tools) is easily recalled by the students because it is basically more in safety measure on how to handle tools in the shop and machine shop tools' terminologies and its function which is familiar to the students. The table also shows that E-mat (Engineering Materials) has the least mean result in year level assessment because the exam has time limit

and composed of uncommon terminologies which is difficult to understand.

Machine Shop and Basic Tools is a starting course that gives students with an understanding of the basics of the duties of a machinist. Students acquire the use of basic machine cutting tools, hand tools and measuring tools. Most courses in basic machine shop cover the use of the five most commonly used machine tools: lathes, shapers, precision grinders, drilling machines, and milling machines.

Welding courses are taken as part of machine shop programs may cover all aspects of welding or may be divided into courses specific to different welding types. Students may learn areas of arc welding, brazing or flame cutting and oxy-acetylene welding. This is an applied learning class where students finish welding projects in order to learn their uses and different techniques of it (Machine shop courses, n.d.).

This course mainly highlights on hands-on practical machine shop techniques. Students will learn basic the machining theory and will be able to accomplish basic machining tasks and other machine shop exercises at the end of this course (Basics of Machine Tools, n.d.).

Table 2. Mean Distribution of the Respondent's Grades on their Major Courses

Course	Mean	Qualitative Description	Rank
Electro1	75.03	Above Average (2.00)	1
E-mat	58.56	Satisfactory (2.75)	3
Machine Shop 1	64.34	Average (2.50)	2

Table 2 presents the mean distribution of the respondent's grades on their major subject. The data that can be seen on the table 2 shows that among the subjects taken by marine engineering students, they got their highest grades in Electro 1 (75.03), followed by Machine Shop 1 (64.34) and then E-mat (58.56) respectively. It clearly shows that their grades in Electro 1 is above average, in Machine shop 1 which is average and grades in E-mat which is satisfactory. Showing that E-mat is the hardest subject taken in that semester because the grades and the result in this course is in congruent with each other.

This is because Electro 1 (Basic Electricity) has more in actual performance and gained the interest of the students in performing the laboratory activities. These laboratories have greater percentage compared to lectures. The table shows that Machine Shop 1 (Hand and Measuring Tools) as a course taken by marine engineering student has second highest mean because it is commonly practiced at home so they have basic

knowledge in this course and smoothly understand its content. The table also shows that E-mat (Engineering Materials) has the least result among the major subjects because it is more on computation and memorizing the formulas, properties and components of a given material. It also requires knowledge in Mathematics where students find difficulties in calculations and problem solving.

This course covers electrical units and their measurement. Insulators and conductors are described. Basic types of electrical sources and loads are studied. Circuit diagrams are interpreted. Basic AC and DC circuits are analyzed. The response of coils, resistors, and capacitors are tested (Basic Electricity, 2016).

In this course, students are taught in practical examples that illustrate how electricity is distributed and used in their facilities and plants. They'll learn how to use electrical test equipment in their future jobs before moving on to a full discussion about major electrical components, how and where these components work, and their purposes within electrical systems. The goal of this basic electrical training course is to teach students how to improve overall proficiency and safety and to reduce equipment interruption (Basic Electricity, n.d.).

Table 3. Correlation Matrix for the Assessment Results and Grades of Marine Engineering Students on their Major Courses

	Electro 1	E-mat	Machine Shop 1
Grades			
Electro 1	.178	.096	.132
E-mat	.129	.158	.385*
Machine Shop 1	.095	.147	.254*

*Correlation is significant at the 0.05 level (2-tailed)

Table 3 presents the computed Pearson correlation for the variables of the study. As can be seen on the table, the assessment on the subject Machine Shop is found out to be correlated to the students' grades on E-mat and Machine Shop 1. The table shows that the understanding of the marine engineering students in courses E-mat and Machine Shop 1 affects the result of their year level assessment.

The result on this matrix proves that E-mat and Machine Shop 1 affects each other. When E-mat gets high, the machine gets high also and vice versa which mean that it is directly proportional to each other. E-mat deals with formulas and mathematical skills while the Machine Shop 1 deals with measuring tools. These two courses are related to mathematics that's why there is a relationship between the two.

Gonzales and Reyes (2012) found out that that students have satisfactory academic performance that they often learned through visual modality and kina esthetic modality but sometimes learned through auditory modality. Furthermore, the academic performance of students is correlated to auditory modality. Instructional development activities were proposed which is then recommended to be used by physical chemistry instructors in their instruction.

Macalindog, Marasigan and Patron (2016) found out that Mechanical Engineering students have fair to passing performance in selected professional courses also obtained highest rating in mental ability, followed by work behavior and trait survey as the least. Unlike low performing students, students that have considerably higher determination in doing their work have significantly higher potentials of positive effect from achievement – oriented activity of the students.

CONCLUSIONS AND RECOMMENDATION

Marine engineering students obtained highest score in Machine Shop 1 in their year level assessment. Marine engineering students observed to have the highest performance in Electro 1 course. E-mat and Machine Shop 1 are found to be correlated with the result of year level assessment. A plan of action was proposed to improve the performance of marine engineering students in their major subjects and year level assessment.

It is recommended that the faculty members may develop plans to help students have better understanding of each and every lesson of a particular course especially the professional ones. Department chair may conduct an assessment to know if an instructor follows the syllabus for the semester. Marine Engineering students may develop study habits to improve their performance in the course. A plan of action may be evaluated and utilized to enhance the performance of marine engineering students in their major subjects. Future researchers may conduct similar to this study and differentiate results from their obtained results.

Table 4. Proposed Plan of Action to Improve the Performance of Marine Engineering Students in their Year Level Assessment

Key Result Area	Strategies	Persons Involved
1. Improvement of the student performance in E-mat	• Conduct tutorial to improve learnings especially in computation based studies. • Appoint students who is capable of peer teaching.	Students, Instructor, LIMA Management
2. Familiarizing about the heat treatment processes and components of steel	• Conduct a pre-test before discussing the topic so that students may have an initial learning. • Motivate the students for self-studying at home.	Students, Instructor, LIMA Management
3. Improvement of mathematical thinking skills.	• Review the basic mathematical laws especially in Algebra • Teach how to derive formulas easily. • Provide techniques to easily recall units of different formula.	Students, Instructor, LIMA Management
4. To strengthen the review program	• Provide review material in advance • Ensure the professor attend seminars and trainings to support in analyzing the student achievement data	Students, Instructor, LIMA Management

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