European Union Findings Used as Checklist
vis-a-vis MAAP Internal Quality Audit Results

***Research Priority Area*: Curriculum Reengineering**

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ABSTRACT

This research sought to convert the European Union findings into a checklist for walk-in-audit. This was compared with the Internal Quality Audit done by QMR. These two (2) audits aimed to prepare MAAP for independent audits by the International Maritime Organizations. Findings revealed that MAAP complied with the requirements for the Department of Academics, particularly for the Instruction Development Office and Program Heads and Function Heads. MAAP complied with the Delivery of Instructions by Academic Supervisors and Instructors, Conduct of Laboratory Exercises and Carrying Capacity, Examination and Assessments, Use of Simulators thru the MAAP Simulator Center, other Facilities and Equipment to Attain Competencies in the STCW Code, and On-Board Training. However, differences and inconsistencies were found between the walk-in audit results by the researcher and the internal quality audit findings on different aspects.

KEYWORDS: independent audit, walk-in audit, compliance to STCW, EMSA report, European Union Findings on Philippine Maritime Higher Education Institution and Philippine Maritime Institution

1. Introduction

The quality standard system is an integral part of the attainment of academic excellence in a maritime higher educational institution. It has been observed that in the course of the audit, most auditors are letter-driven rather than task-completion-driven. This means that most auditors cannot see the holistic component of the audit process because they have the tendency to be myopic.

A sick person for example is often diagnosed its immediate physical symptoms but failed to see the inner mental state that may be affecting his overall general health. This applies also in school. It has its own organizational health that is interrelated with each other. If a school is deficient in a certain area, it might be an attribute of a factor that the school failed to recognize. According to De Smet and his colleagues (2007), conceptualizing health of organizations emerges out of a metaphor "performance and health," which improves when cared for and deteriorates when ignored. This signifies the importance of synergy in an organization.

The legal mandate of the Quality Standard System is stipulated in Article XII of CMO 67 Series of 2017, "Revised Policies, Standards and Guidelines for the Bachelor of Science in Marine Engineering and Bachelor of Science in Marine Transportation. All maritime higher educational institutions must comply with the minimum standards and guidelines governing a standard quality standard system pursuant to Regulation 1/8, Section A 1/8, and Section B 1/8. It is therefore imperative for all maritime schools to clearly define their educational and training objectives and the competency standards. The knowledge, understanding, and skills/proficiency that must be demonstrated are aligned with the assessments developed and validated.

This research sought to convert the European Union findings into check list, which was used as a tool in the walk-in-audit done by the AVP for Academics. This was compared with the Internal Quality Audit done by QMR. These two (2) audits have its main objective of preparing MAAP for the upcoming independent audit by the International Maritime Organizations, Independent Auditors.

Specifically, this research sought answers on the following objectives:

1. To convert the EU Findings into a checklist as a tool in the conduct of audit to determine the compliances of the Maritime Academy of Asia and the Pacific;
2. To compare the walk-in audit done by the researcher and the results of the QMR Internal Quality Audit;
3. To recommend measures to improve the audit process.

This research limits its focus on the auditing process done by the Maritime Academy of Asia and the Pacific from January to April of 2022. Three (3) audits happened in three (3) months. These are the walk-in audit that was done by the researcher, the walk-in audit done by QMR, and the Internal Quality Audit that was done by MAAP. The walk-in audit done by the researcher happened from the 3rd week of January 2022 to the 1st week of February 2022. The walk-in audit done by QMR in preparation for the IMO visit was on the 2nd week of February 2022 to the 3rd week of February 2022 and the Internal Quality Audit was done on the 1st to 2nd week of March 2022.

The output of this research is to recommend measures on how to improve the audit process by focusing on the intention of the audit and as much as possible to eliminate a letter-driven approach in auditing.

Review of Related Literature. Research conducted by Tuzzahrah, N., Winarningish, S., Mulyani, S., Akbar, B. (2021) entitled "Research Audit Quality and its Impact on an Organization's Reputation" The researchers concluded that the independence of auditors has a direct positive

influence on the quality of investigative audits. An increase in the auditor independence level will result in better audit quality. The impact is attributed to the ability of auditors to develop an investigative audit program, determine the audit methodology and procedures, and determine the scope of the investigative audit. Independence has a direct positive impact on the BPK's reputation as an audit institution. The higher the level of independence possessed by the auditor, the better the credibility of the BPK's reputation. This is affected by the extent of independence that the auditor possesses in acting against particular motives that might hinder the audit process, in disclosing fraud, reporting the value of state losses, and in disclosing the affiliated parties. The quality of investigative audits also exerts a positive impact on BPK's reputation. The increased quality of an investigative audit report will lead to an increased perception of the BPK as a credible audit institution. This effect is attributed to the capacity of the auditor supported by a credential of expertise in the field of investigation, the ability of the auditor to disclose irregularities, and the implications of irregularities. Independence also has a positive impact on the BPK's reputation through the quality of investigative audits. Such an influence is attributed to the auditor obtaining the independence to determine the investigative audit program, methodology, and procedures and the independence to disclose fraud, report the value of state losses and disclose the affiliated parties.

In research conducted by Marcelo Porte, et.al. entitled "Research in Auditing", which aims to correct this gap by studying the themes about auditing after the post-SOX period, identifying the changes occurred in the thematic areas and relating their association in auditing.The results placed seven established themes in auditing, which are audit market, audit report and financial statement users, corporate governance, fraud risk and audit risk, international regulation, liability and litigation, and non-audit services. Despite the changes that took place after the period of the SOX enactment, these themes continued being part of the researches. They were tracked in every year of the sampling and there was an evolution in their representativeness percentages when compared to previous studies.

After the SOX period, the results presented eight themes, which keep losing strength in auditing research. They are audit procedures, audit sampling, auditor's judgment, auditor-auditee contract, education, going-concern opinion, profession, and tax audit. The reason for their decline is the fact that their representativeness percentages have decreased in the results presented in comparison to the existing literature.

As a new element, the current study managed to evidence the seven themes that emerged after the SOX enactment. These themes were not indexed as auditing themes in former research in academic literature. They are audit committee, external audit, internal audit, internal control, media coverage in accounting, research, and socio-economic data of the company.

Another important contribution of this research was identifying the thematic associations in auditing. Now researchers will improve their understanding of what really occurs in the investigations when they acknowledge, for example, that corporate governance is not only the second most distinguished theme in auditing but also the most related to other themes. It is a demonstration that even more than understanding technical and legal aspects in auditors' profession, researchers are concerned about factors that affect the auditors' clients.

Finally, this study managed to accomplish the objectives proposed, bringing up to date the existing themes in auditing literature and presenting the existing connections between them. However, it has limitations as well as every other study. The first of them is having used only publications from Web of Science as its sample size. Another limitation is due to the quantity of scientific journals analyzed which were limited only to 21, hiding from its results the journals which had less than 1% of their publications analyzed.

In conclusion, we question ourselves if the themes rated as established will remain in the future the same way they were presented in the period of this research; and if the emerging themes will become established or will decline just as a scientific short trend from that time. Also, if the declining themes will have the strength to emerge again or if they will not be part of the scientific journals anymore. At last, we question if by the SOX enactment the themes in evidence were the only ones to have the merit to be published, because they were not recurrent in scientific journals. Certainly, those are questions that researcher will be further concerned to answer in their new studies, in order to give dynamism and progress to auditing researches in the future.

Research shows that personnel who stayed long in the service were not only primarily motivated by the financial remuneration but by their being recognized, applauded, and commended for the accomplishments they have demonstrated in their respective offices. This is the impact of a positive approach to auditing. Cost-effectiveness of audit is needed to establish the value of different interventions (Black Oxford University Press 1992). It must be holistic not only calling the mistakes but worth mentioning the accomplishments.

Research revealed by Rampalli Prabhakara Raya and Sivapragasam Panneerselvam on their research entitled the Healthy Organization Construct mentioned that while acknowledging the importance of work and its contribution to well-being, it is equally significant to recognize the negative impact of the working environment on the health and well-being of individuals in general. This is because; work is becoming more fluid and less bound by space and time because of globalization, economic liberalization, and technology diffusion (Raya et.al, 2013) Since work is fluid and less bound by space it is imperative the regular monitoring through audit is imperative.

2. Methods

This research is purely qualitative documentary in nature. Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Bowen, 2009). This research is purely action research. Action research is a form of collective, self-reflective inquiry that participants in social situations undertake to improve: (1) the rationality and justice of their own social or educational practices; (2) the participants' understanding of these practices and the situations in which they carry out these practices (Emerald Insight). It did not employ the use of questionnaire but focused primarily in converting the EU Findings into Audit Check List. This audit check list was used as tool in the conduct of walk-in audit by the researcher in the following offices of the Maritime Academy of Asia and the Pacific.

a. The Department of Academics which was composed of the Dean of Academics, Program Head for BS Marine Transportation, and Asst Dean of Academics representing the program for BS Marine Engineering
b. Academic Supervisor's Office which was composed of the Function Heads for Deck and Engine and the Group Leaders for Social Sciences and Math/Natural Sciences
c. Instruction Development Office which was composed of course developers of maritime courses and general education courses.
d. MAAP Simulator Center which was composed of the MSC Director and the facilitators for deck and engine
e. Department of Shipboard Training which was composed of DST Director and the training officers
f. Center for Competency Assessments which was composed of the CCA Acting Director and the assessors for BS Marine Transportation and BS Marine Engineering

The data gathered were taken from walk-in audit results, quality internal audit results and interviews.

INPUT	PROCESS	OUTPUT
EU FINDINGS IQA AUDIT TOOL	A. CONVERSION OF EU FINDINGS INTO CHECKLIST B. CONDUCT OF WALK IN AUDIT AND INTERNAL QUALITY AUDIT C. EVALUATION OF THERE CONSISTENCIES	IMPROVEMENT OF AUDIT PROCESS THAT CAN BE DRAFTED AS POLICY AND GUIDELINES FOR MAAP

The Paradigm of the Study illustrates that the Input is European Union Findings and the Results of the IQA Internal audit that was done during the 1st week of March 2022. The Process is to convert the EU Findings into a checklist that can be used to audit the offices that directly design, develop, and implement the provision of the Standards of Training, Certification, and Watchkeeping (STCW) Code. The results of the walk-in audit using the EU findings as a reference will be compared with the Internal Audit that was done recently. By merely looking at the results using the tables, the researcher was able to elucidate the inconsistencies and the consistencies of the audit made since each audit has its intention of preparing MAAP for an independent audit held on the 7th of April of 2022. The output of this research is to recommend measures on how to improve the audit process by focusing on the intention of the audit and as much as possible to eliminate a letter-driven approach in auditing. These recommended measures can also be used by the management as policy in improving future audits.

3. Results

The following items in the tables are the converted European Maritime Safety Agency findings in the conduct of maritime education and training among Higher Maritime Education Institutions in the Philippines. This was used by the researcher as checklist in his walk-in audit to determine MAAP compliance on STCW.

Table 1. Academics Compliance to STCW

ACADEMICS COMPLIANT ON STCW
1. Full implementation of outcome-based syllabus.
2. Course topics and the learning outcomes are identified
3. There is brief description of the content of topics.
4. Teaching hours allocated for lectures and laboratory sessions are identified.
5. The course syllabi describe briefly the teaching and learning activities.
6. The course syllabi identify the reference materials, training facilities and equipment.
7. Consistent teaching and examination methods, facilities and equipment are well established.
8. “Plan and ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes”, stress-calculating equipment is well established.
9. All KUPs specified by the STCW Code for the competences are addressed Detailed Teaching Syllabus Compliant
10. “Transmit and receive information using GMDSS subsystems and equipment
11. Knowledge on ‘the means to prevent false distress alerts and procedures to mitigate the effects”
12. ‘MARCOM’ include content on operational communication procedures.
13. ‘General provisions on ship’s routing’ and ‘principles of ship reporting and VTS procedures.

ACADEMICS COMPLIANT ON STCW
14. 'Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment
15. 'International regulations on the carriage of dangerous cargoes.
DETAILED TEACHING SYLLABUS COMPLIANT
16. "Monitor the loading, stowage, securing, care during the voyage and the unloading of cargoes"
17. "Plan and conduct a passage and determine position" and "Maintain a safe navigational watch"
18. Specification of fundamental references and study materials concerning the addressed KUPs.
19. Include the International Maritime Solid Bulk Cargoes (IMSBC) Code as reference.
20. International Code on Intact Stability, 2008, and the International Convention on Load Lines, 1966, as reference
21. Use of the IMDG Code for teaching cargo handling and stowage involving dangerous goods.

MAAP is STCW compliant on academic requirements and teaching syllabi but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this area. "Course syllabi provide valuable information which enables meaningful communication between the students and the instructors. They can also be used as a contract, a plan or as a means for learning and teaching. The lively and effective classroom atmosphere, where all the students are engaged into the lesson, could be obtained when the syllabi are prepared thoroughly in order to answer students' questions and comments beforehand" (Tokatlıa and Keúlia, 2009).

Table 2. MAAP Delivery of Instructions Compliant to STCW

MAAP DELIVERY OF INSTRUCTIONS COMPLIANT TO STCW
1. Monitoring, supervision, and evaluation of training and assessment is well established
2. This is continuously monitored through a quality standards system.
3. Systematically plan the courses and follow the lesson schedules or timetables.
4. Plan for conducting the practical exercises and activities is indicated in the policy.
5. "Application of leadership and teamworking skills is indicated in the policy".

MAAP is STCW compliant on the delivery of instructions but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this aspect. According to Comfort O. Reju and Loyiso C. Jita, well-designed course materials and instructor support are very important to the success of distance and online learning of undergraduate and the processes involved in this study were fundamental because they helped to clarify thoughts of the learner (Reju and Jita, 2018).

Table 3. MAAP Conduct of Laboratory Exercises and Carrying Capacity Compliant to STCW

MAAP CONDUCT OF LABORATORY EXERCISES AND CARRYING CAPACITY COMPLIANT TO STCW
1. Practical training at laboratories and workshops are carried out.
2. Students' attendance is recorded systematically and reliably.
3. 'Carrying capacities' are calculated and consistent with the number of students admitted to courses.

MAAP is STCW compliant on the conduct of laboratory exercises and carrying capacity but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this area. According to Townsend, many students reported that science was more enjoyable when activities and labs were part of the learning experience, and they learned better when they were able to be active in their laboratory learning (Townsend 2012).

Table 4. MAAP Conduct of Assessments Compliant to STCW

MAAP CONDUCT OF ASSESSMENTS COMPLIANT TO STCW
1. Examination and assessment of competence is well-established.
2. Performance criteria are identified clearly, explicitly valid and available to the candidates for information
3. Assessment criteria are established clearly and are explicit to ensure reliability and uniformity of assessment.
4. Candidates are briefed clearly on the tasks and/or skills to be assessed.
5. Assessment of performance takes into account normal operating procedures.
6. Scoring or grading methods to assess performance are validated.
7. Candidate demonstrates the ability to carry out a task safely and effectively to the satisfaction of the assessor.
8. Laboratory equipment in practical examination is in accordance with STCW Regulations.
9. Theoretical and practical assessment of competences is done in accordance with STCW Regulations.
10. Practical assessment conducted by assessment centers is done in accordance to STCW Regulations.

MAAP is STCW compliant on assessments but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this area. “Perhaps the most surprising aspect of student-centered assessment is that it is motivating. Many people associate being evaluated with mild to moderate anxiety, not motivation, and research has shown that grades can be associated with decreased motivation and lower achievement (Butler & Nisan 1986; Lipnevich & Smith 2008). However, recent studies have shown that formative assessment—particularly detailed, task-specific comments on student work—can activate interest in a task (Cimpian et al. 2007) and result in better performance (Lipnevich & Smith 2008).”

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Table 5. MAAP Use of Simulators Compliant to STCW

MAAP USE OF SIMULATORS COMPLIANT TO STCW
1. Availability and use of training facilities and simulators is in accordance with STCW Regulations.
2. Availability of appropriate and maintained facilities, equipment and simulators.
3. Available at the chart plotting room is a minimum of 80 nautical charts of different scales and types.
4. Available sufficient navigation simulators for all the students enrolled.
5. ECDIS simulator stations are sufficient to train all the students enrolled in the relevant courses.

MAAP is STCW compliant on the use of simulators but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this area. Simulations are dynamic technological tools created through delivery platforms to provide a scenario-based environment. Students work collaboratively to solve real-world situations and problems, thus ameliorating authentic and collaborative learning (Vlachopoulos & Makri, 2017).

Table 6. MAAP Facilities and Equipment Compliant to STCW

MAAP FACILITIES AND EQUIPMENT COMPLIANT TO STCW
1. There is relevant equipment in the technical workshop for training purposes
2. Auxiliary machinery workshop allow training to be completed in dismantling, inspecting, repairing and reassembling tasks.
3. Radar and ECDIS monitors and its mini-bridges is capable to display a circular image.
4. Auxiliary machinery workshop ensure training in dismantling, inspecting, repairing and reassembling machinery equipment consistent with the standard specified.

MAAP FACILITIES AND EQUIPMENT COMPLIANT TO STCW
5. Dummy EPIRB and SART, in the GMDSS laboratory is present.
6. 'Full mission bridge' simulators have a fixed VHF set at the bridge console
7. Appropriate level of realism consistent with the assessment is attained.
8. Design, testing, approval, and practice of simulator exercises were not conducted.
9. Simulator exercises training objectives, scenario description and performance and assessment criteria were specified
10. Simulator exercises are systematically tested to ensure their suitability for the specified training objectives
11. "Detect and identify the cause of machinery malfunctions and correct faults is established"

MAAP is STCW compliant on facilities and equipment but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this area. The study on the impact of facilities on students achievements has revealed important insights into the facilities and academic achievement (Ramli and Mohd Zain, 2019).

Table 7. MAAP On-board Training Compliant to STCW

MAAP ON-BOARD TRAINING AND ITS COMPLIANT ON STCW
1. Navigational watch on ships of 500 gross tonnage or more have approved seagoing service of not less than 12 months
2. Engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room shall have completed combined workshop skill training and an approved seagoing service of not less than 12 months
3. Engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room shall have completed combined workshop skill training and an approved seagoing service of not less than 12 months
4. Electro-technical officer shall have completed not less than 12 months of combined workshop skills training and approved seagoing service of which not less than 6 months.
5. Follow an approved program of onboard training.
6. Information documented in the Training Record Book (TRBs) is present.
7. TRB format allow verification that students received systematic practical training and experience.
8. Defines the specific training tasks or duties required.
9. Keeps records to ensure verification of the completion of the compulsory watchkeeping duties by the students.
10. Procedures are applied for those students who are unable to complete the on-board training in six years or more.

MAAP is STCW compliant on shipboard training but there were differences on the walk-in audit by the researcher and the results of internal quality audit on this area. "The maritime vocational education should be having a training ship for support learning process to obtain learning out comes. Consequently, marine officers are increasingly under heavy burden, and should have more ship operation capabilities than before" (Nam, 2006).

4. Discussion

Maritime Academy of Asia and the Pacific is STCW compliant on academic requirements, development of teaching syllabi, delivery of instructions, laboratory exercises, carrying capacity, conduct of assessments, use of simulators, faculties, equipment and shipboard training. There were differences on the walk-in audit by the researcher and the results of internal quality audit on academic

requirements, development of teaching syllabi, delivery of instructions, laboratory exercises, carrying capacity, conduct of assessments, use of simulators, faculties, equipment and shipboard training. This means that the objective of the internal quality audit was not aligned with the objectives of the walk-in audit done by the researcher.

Audit usually involves a quality improvement cycle that measures care against predetermined standards (benchmarking), takes specific actions to improve care and monitors ongoing sustained improvements to quality against agreed standards or benchmarks (Alison, 2014).

5. Conclusions and Recommendations

Conclusions

1. The EU Findings were converted into checklist that was used to determine the compliances of MAAP on STCW Code. The Department of Academics thru the duties and responsibilities of the Program Heads, Function Head and Group Leaders, the onboard shipboard training thru the Department of Shipboard Training, the use of simulators in courses thru MAAP Simulator Center and assessments thru Center for Competency Assessments are in compliant with the STCW Code as amended
2. There were differences on the results of audit made by researcher and the results of the Internal Quality Audit on the compliances of MAAP on STCW Code on all dimensions used in this research.
3. Recommendations can be formulated to improve the audit process in the Maritime Academy of Asia and the Pacific.

Recommendations

1. There should be one auditor during internal quality audit to determine the compliances of the Department of Academics, Department of Shipboard Training, MAAP Simulator Center, Center for Competency Assessments and Instruction Development Office to determine the constructive alignment of these offices
2. Auditors during Internal Quality Audit should be more focused on the compliances of the offices on STCW Code rather than giving a lot of Opportunity for Improvement. This will give ample time for the auditee to concentrate on their observations and non-conformities.
3. Auditors during Internal Quality Audit should have the sane references as to when a finding can be called as observations, non-conformity or opportunity for improvement.
4. Further researches can be done to determine the compliances of MAAP on other areas of STCW Code.

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A Proposed Enhancement Course
for the Design, Development and Delivery of a Curriculum for Philippine MHEIs

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

This paper discusses the process of developing a proposed enhancement course for curriculum design, development, and delivery under the outcome-based education system of the Philippine maritime education and training programs. It lays down the rationale for the need to develop a course that shall address the weaknesses of the maritime faculty of the present maritime education and training system in the Philippines for both the Bachelor of Science in Marine Transportation and the Bachelor of Science in Marine Engineering. The paper discusses the results of a survey done by the Philippine Association of Maritime Institutions (PAMI) regarding the training needs requirements of the faculty of various MHEIs all over the Philippines. Despite the availability of training courses such as the IMO Model Course 6.09, IMO Model Course 3.12, and IMO Model Course 6.10, it has led to the result of the finding by the EMSA audit conducted in March 2020 which showed a weakness in the area "Program Development, Validation and Approval System" of the maritime administration and MHEIs. Using the ADDIE model for curriculum design and merging the learning theories of experiential and reflective learning, the course was developed using the framework of the IMO Model Course. A finished course shall be presented and will be pilot tested.

KEYWORDS: *ADDIE, experiential learning, faculty development, IMO Model Course and reflective learning*

1. Introduction

The Philippines is a major supplier of the world's 1.89 million maritime labor force, which showed an increase of 11.8% for officers and engineers based on the BIMCO-ICS 2021 Seafarer Workforce Report, 2021 Edition. If the demand is unsatisfied, BIMCO-ICS projects a shortfall of 26,240 officers/engineers by 2026. The largest proportion of officers in charge aged between 21 and 30 are Indian, and the largest proportion between 31 and 40 are Chinese. BIMCO 2021 reports that 43.7% and 26.5% of Filipino management-level officers are aged 41-50 and 51-60 years old, respectively, while 39.4% and 24.3% of the Filipino operational level are 31-40 years and 41-50 years old respectively. Filipino ratings fall within the 31-40 age bracket.

When recruiting STCW-certified seafarers, shipping companies reported that the highest difficulty is recruiting Engineering and Electro-Technical officers while advising that it is relatively easier to recruit ratings to work for both deck and engine. As the Philippines is the leading supplier of officers as of 2021 based on the BIMCO-ICS 2021 Seafarer Workforce Report, it is now questionable why those students finishing completed classroom instruction (CCI) who board their ships for OBT or work does not progress to the officer in charge of a navigation or engine watch after the 36 months sea service as provided by the STCW 1978 as amended. Could this be related to the outdated approach in the curriculum design, development, and delivery of maritime programs content and topic-based?

Currently, there are 90 Maritime Higher Education Institutions (MHEIs) authorized by CHED-MARINA to offer either or both the Bachelor of Science Degrees in Marine Transportation and Marine Engineering from 87 from July 2019 (MARINA Website). There may have been new MHEIs who was given a permit to operate and recognition, and there may also be some schools that were given phaseout orders.

Professional faculty must complete the IMO Model Course 6.09, 3.12, and 6.10 from accredited training institutions before teaching or handling classes. These courses are entry-level and are requirements per the CHED CMO 67 series of 2017 and JCMMC 1 series of 2019 and 2022. No other institutionalized training where required from professional faculty teaching professional subjects in MHEIs under the BSMT and BSMarE programs. Some institutions require their faculty to take graduate programs vertically or horizontally related to their area of expertise as part of their faculty development programs. But this has yet to improve the design, development, and delivery of the curriculum for the two (2) programs. In the last ten years, we have changed our curriculum for both programs 5-6 times, one of which is incomplete as only the list of courses was given with their specific units and Pre/Co-requisites but no program of studies and course specification that states the course outcomes per course.

CHED CMO 46 s2012 states that one of the rational of all higher education programs is to produce graduates with higher levels of academics, thinking, behavioral, and technical skills/competencies aligned with national academic and industry standards and international standards. As the existing recognized maritime education programs by CHED and MARINA are all governed by meeting the STCW 1978 as amended, these maritime programs must contribute to attaining such competencies.

In 2017 EMSA visited and audited the Philippines, and some findings showed that CMO 46 s 2012 still needed to be fully implemented by MHEIs. Findings in some MHEIs include the following: (1) There is a need to adjust the institution's curriculum following a logical sequencing of topics. A certain competence must be taken up before proceeding to the next. (2) The learning activities and exercises should address the learning outcomes. (3) There is a need to adjust the institution's curriculum

following a logical sequencing of topics. A certain competence must be taken up before proceeding to the next. (4) The syllabus does not address the competences required by the STCW Code, as it lacks demonstration as a teaching method. (5) Some questions are constructed so that it does not address the specific competence.

In 2020 EMSA again visited and audited the Philippines and found similar findings in the area of Program/Course Design, Review, and Approval, such as: (1) The programme and course design method based on the curriculum mapping needed to consistently ensure that programmes and courses addressed all the required competences. (2) The inconsistent sequence of courses and course topics, activities and learning outcomes, and inconsistent teaching and examination methods, facilities, and equipment. (3) Courses did not cover all KUPs specified by the STCW Code for the competences addressed

Although similar issues were found in both visits, a lack of corrective actions was accomplished in correcting the problems regarding the Program/Course Design, Development, and Delivery area.

2. Methods

The curriculum design theory used in the study is the constructivism and activity (experiential learning) model, which constructs learning based on reflecting a learning experience. This theory is combined with Vygotsky's Theory of social interaction to facilitate student learning. In addition, we stuck to the Learner-Centered design for curriculum development, which is the cornerstone of outcome-based education. The subject and content-centered approach to curriculum design needs to be revised to upgrade the faculty of Philippine Maritime Higher Education Institutions in solving the perennial issues of achievement of competency as the main objective of the curriculum.

In developing the instructional design for the specific course outcomes, the ADDIE model was used. This approach ensures that the planning and creation of the learning experience are achieved. The ADDIE model also ensures continuous improvement of the curriculum being a flexible instructional design model.

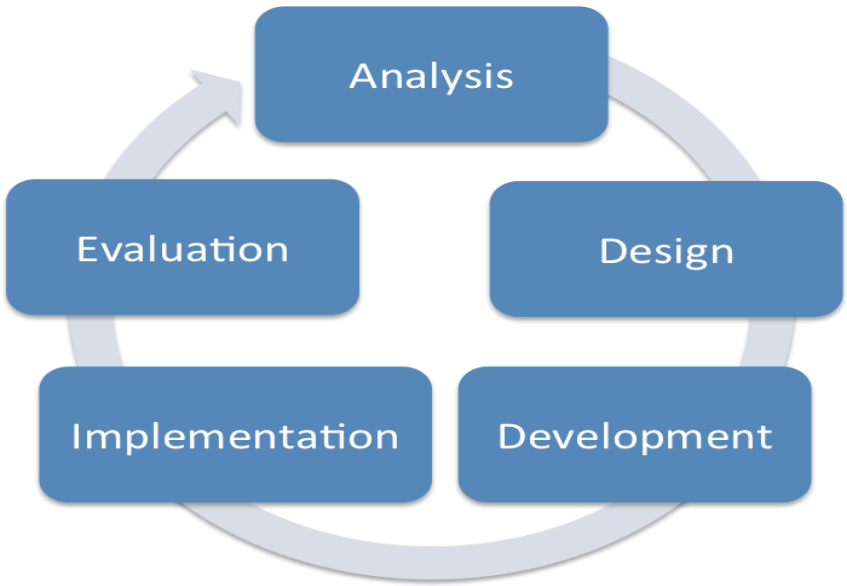

Fig. 1 ADDIE Model: Instructional Design - Educational Technology

In the analysis stage, the proponent identified the strength and weaknesses of professional maritime faculty through the results of CHED-MARINA audits, EMSA audits, and the results of the training need survey conducted by PAMI. In addition, we considered the readiness of most faculty to participate in online courses and learn. The required internet bandwidth and computer gadget needed to have seamless delivery of online courses was identified as a requirement to be able to participate.

Table 1. PAMI TNA Survey of 198 Professional Faculty from Various MHEIs on 7 July 2021

Particulars	Highly Important	Moderately Important	Not Important
Curriculum Design	171	24	3
Curriculum Development	170	26	2
Curriculum Delivery	168	28	2
Use of Online Platform	157	40	1
Online Teaching Methodologies	169	29	0
Learning Outcomes Development	173	24	1
STCW Familiarization	160	36	2

As shown in the data, the above particulars show how the faculty of MHEIs perceive the need for training in these areas. These particulars guided the proponents to identify the course outcomes and learning outcomes that were needed in the course design.

EMSA/EC Findings on the Area Programs and Course Design, Review and Approval include: (1) Insufficient design of Maritime Education and Training programs for certification of masters and officers, (2) Inconsistent provisions on the competences that the BSMT and BSMarE programs should cover, (3) Inconsistent teaching and examination methods, facilities, and equipment, (4) Courses do not cover all KUPs specified by the STCW Code for the competences addressed, and (5) Several course syllabi need to specify fundamental references and study materials concerning the addressed KUPs and include obsolete references and topics.

These findings further display the weakness of the curriculum design and development process in Philippine Maritime Education and Training (MET) for officers in meeting the competency requirements of STCW 1978 as amended for Officers in Charged of a Navigational and Engine Watch.

There are three theories of teaching, according to P Ramsden (2003): teaching as telling or transmission, teaching as organizing student activity, and teaching as making learning possible.

The last piece considered by the proponents was to include reflective practice based on experiential learning activity as the icing on the cake. This strategy followed the third theory of teaching by P Ramsden, "Teaching as making learning possible *."Teaching is a process of working cooperatively with learners to help them change their understanding. Teaching involves finding out students misunderstanding, intervening to change them, and creating a context of learning that encourages the student to engage with the subject matter* (Ramsden, 2003). Student reflection after a learning activity enhances their learning in collaboration with their peers and the teacher.

3. Results

In the documentation for the development of the course curriculum, the proponents used the framework of IMO Model courses, a standard used internationally in documenting developed courses which include: Part A - Course Framework, Part B – Course Outline, Part C – Course Detailed Teaching Syllabus, and Part D – Instructor Manual or Guidance.

Part A. Course Framework

Scope and Aims - This course is specifically designed to provide a face-to-face or online upgrading seminar-workshop of the Maritime Higher Education Institutions instructors/facilitators in the design, development, and delivery of maritime curriculum based on the conducted training workshop on the DESIGN, DEVELOPMENT, AND DELIVERY OF CURRICULUM for the Implementation of the STCW Convention dated December 2021 to January 2022. In addition to the fulfillment of the identified priority areas during the scoping workshop held on April 2022 and to improve the effective implementation of and compliance with the obligation of the Philippines in the STCW Convention, this course highlights specifically the compliance for both Regulation I/6, Training and Assessment requirements specifically in terms of the qualification of assessors, and, Regulation I/8, quality standards, of the STCW Code and Convention in the approved Maritime Education and Training programs.

This course shall be delivered at the PQF level 7 and aims to focus on the principles of evidence-based, collaborative, and reflective learning practice by:

1) facilitating training that will refresh and enhance the relevant and necessary learning theories and curriculum development skills of the instructors and facilitators in the Philippine Maritime Higher Education Institutions.

2) providing useful and vital topics that need to be applied in the design, development, and delivery practice of the instructors/facilitators with limited teaching experience and enhance the skills of those who have been doing curriculum development and delivery focusing on the learners within an Outcome-based educational system.

3) providing additional provisions of different principles and theories involved in formative and summative assessment processes and how they can be applied to every assessment situation of the learners in Outcome-Based Education.

4) providing experiential learning in all aspects of curriculum design, development, and delivery of Maritime Education Programs through collaborative and individual learning practice.

5) allowing participants to reflect on their design, development, delivery, and assessment practice and plan for improvement.

Course Learning Outcomes - After completing the course, the participants are expected to: (CO1) Evaluate relevant theories of teaching and learning and their applications in your teaching practice; (CO2) Develop outcomes/tasks for a specific competency in the STCW Code for OICNW or OICEW; (CO3) Design, plan, and justify teaching and learning activities for a learning outcome develop in CO2, using appropriate theories and teaching methods for courses that will engage and challenge your learners; (CO4) Develop formative assessment tools to measure the learning of the prescribed outcomes within your developed course; (CO5) Deliver developed course lesson plan/instructor guide for a specific learning outcome; and (CO6) Design and develop a curriculum for a professional programme of study leading to a relevant nationally approved qualification and certification as an officer/engineer of a merchant ship

Entry Standards - This course will accommodate primarily those who have a bachelor's degree, have taken the IMO Model Course 6.09, and have at least one (1) year of teaching experience.

Course Certificate - A certificate or document, "Certificate of Completion," shall be issued to a participant who successfully complied with the required outputs and completed the whole duration of the refresher and enhancement training course.

Course Intake Limitation - The maximum number of trainees shall be at most 16 per class to ensure the quality of instruction. If facilitated online, a maximum of 20 participants may be

accommodated, but an extension of course delivery may be needed. Participants must be ready to invest time outside of synchronous classes to accomplish assignments.

Staff Requirements - This course shall be conducted by the participants of the IMO Virtual National Training on Principles of the "Design, Development and Delivery of Curriculum" for the Implementation of the STCW CONVENTION or equivalent programs in curriculum design and development for teaching and learning in an Outcome-Based Educational System for Higher Education (who must have the willingness to take part in the training as facilitators)

Course Assessment - Assessment tasks for course outcomes shall be either individual or small-group outputs. Successfully passing all these course outcomes shall lead to the completion of the course.

Training Facilities and Equipment - For face-to-face, the classroom shall be equipped with whiteboard/glass board, TV Monitor as a projector with, clicker with a laser pointer, inkjet printer, instructor's table and chair, and chairs and tables for 16-20 participants. It should also have computer set for the use of Instructor with MS Office Word, PowerPoint/Slides, Slide, Canva, and others. Electrical sockets and extension cords adequate for the number of trainees and positioned safely are needed.

For Online, stable Internet connection of at least 5 Mbps is recommended. Laptop or desktop PC with a camera and Zoom video conferencing software are required.

Teaching Aids (A). The teaching aids include: (1) Visual presentations, (2) Training videos related to assessment, and (3) Exercise Sheets.

IMO References (R). These materials include STCW Convention and STCW Code 2017 Edition, with the 2010 Manila Amendments, and IMO Model Courses 7.01, 7.02, 7.03, 7.04, and 6.09.

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Part B. Timetable

Time	Week 1-Day 1	Week 1-Day 2	Week 1-Day 3
16:00-18:30	Introduction	Reflect on the relevant theories of teaching and learning and their applications in your teaching practice.	Reflect on the relevant theories of teaching and learning and their applications in your teaching practice.
	Week 2-Day 1	**Week 2-Day 2**	**Week 2-Day 3**
16:00-18:30	LO1.4 Differentiate the various teaching and learning theories and the practicality of their use in your own teaching practice (Submission) Develop outcomes/tasks for a specific competency in the STCW Code for OICNW or OICEW	Develop outcomes/tasks for a specific competency in the STCW Code for OICNW or OICEW	LO2.6 Write effective LOs for different taxonomy levels of the cognitive, psychomotor, and affective domains based on 3 components for given STCW Code competency
	Week 3-Day 1	**Week 3-Day 2**	**Week 3-Day 3**
16:00-18:30	LO2.6 Write effective LOs for different taxonomy levels of the cognitive, psychomotor, and affective domains based on three components for given STCW Code competency (Submission)	Design, plan, and justify teaching and learning activities using appropriate theories and teaching methods for courses that will engage and challenge your learners.	Design, plan, and justify teaching and learning activities using appropriate theories and teaching methods for courses that will engage and challenge your learners.

	Week 4-Day 1	Week 4-Day 2	Week 4-Day 3
16:00-18:30	LO3.4 Plan a teaching and learning activity for a specific learning outcome via face-to-face and online approach (Presentation/Submission)	Develop assessment tools to Measure learning of prescribed outcomes within your developed course curriculum	Develop assessment tools to Measure learning of prescribed outcomes within your developed course curriculum
	Week 5-Day 1	**Week 5-Day 2**	**Week 5-Day 3**
16:00-18:30	LO4.4 Compare the various assessment methods with respect to the type of learning outcome it should address and its advantages and disadvantages (Submission)	Deliver your developed course lesson plan/instructor guide for a specific learning outcome.	Deliver your developed course lesson plan/instructor guide for a specific learning outcome.
	Week 6-Day 1	**Week 6-Day 2**	**Week 6-Day 3**
16:00-18:30	LO5.5 Reflect on your delivered course for a specific outcome and plan for improvement (Presentation)	LO5.5 Reflect on your delivered course for a specific outcome and plan for improvement (Presentation)	LO5.5 Reflect on your delivered course for a specific outcome and plan for improvement (Presentation)
	Week 7-Day 1	**Week 7-Day 2**	**Week 7-Day 3**
16:00-18:30	Design and develop a curriculum for a professional program of study leading to a relevant nationally approved qualification and certification as an officer/engineer of a merchant ship following OBE principles	Design and develop a curriculum for a professional program of study leading to a relevant nationally approved qualification and certification as an officer/engineer of a merchant ship following OBE principles	Design and develop a curriculum for a professional program of study leading to a relevant nationally approved qualification and certification as an officer/engineer of a merchant ship following OBE principles Closing Program (Distribution of Certificate of Attendance)

Part C. Course Syllabus

SUBJECT	**ONLINE**		**Assigned Facilitator**
	ACTIVITY SYNCHRONOUS	**ACTIVITY ASYNCHRONOUS**	
Introduction • Underpinning Principles of this training workshop • Definition of terms • STCW 95, as amended • Curriculum Design, Development, and Delivery • Timetable and Outline • Course Toolbox • Reflective Practice	2		
	2		

SUBJECT	ONLINE		Assigned Facilitator
	ACTIVITY SYNCHRONOUS	ACTIVITY ASYNCHRONOUS	
CO1. Reflect on the relevant theories of teaching and learning and their applications in your teaching practice.			
LO1.1 Explain the core elements of education with reference to learner-centered education	.5		
LO1.2 Explain the key theories of learning in the 20th century and the guiding principles of learning	1		
LO1.3 Explain the Quality Teaching Model from the perspective of a learning environment of a world outside the classroom and school	.5		
LO1.4 Explain reflective practice and its advantages for teachers and learners	.5	2	
LO1.4 Differentiate the various teaching and learning theories and the practicality of their use in your own teaching practice		2	
	2.5		
CO2. Develop outcomes/tasks for a specific competency in the STCW Code for OICNW or OICEW			
LO2.1 Compare the maritime education framework of the Philippines with other countries	1		
LO 2.2 Explain the principles of outcome-based education	.5		
LO 2.3 Differentiate learning outcomes from learning objectives in the perspective of teaching-learning practice	.5		
LO2.4 Explain the components of a Learning Outcome statement and how they relate to level descriptors	1		
LO2.5 Improve various given learning outcomes for completeness		1	
LO2.6 Write effective LOs for different taxonomy levels of the cognitive, psychomotor, and affective domains based on 3 components for given STCW Code competency		2	
	3		

SUBJECT	ONLINE		Assigned Facilitator
	ACTIVITY SYNCHRONOUS	ACTIVITY ASYNCHRONOUS	
CO3. Design, plan, and justify teaching and learning activities using appropriate theories and teaching methods for courses that will engage and challenge your learners.			
LO3.1 Explain the Quality Teaching Model from the perspective of a learning environment of a world outside the classroom and school	.5		
LO3.2 Explain the various curriculum design and development models for regular face-to-face and online e-Learning environment	1		
LO3.3 Explain the various teaching strategies for quality teaching and learning	2		
LO3.4 Plan a teaching and learning activity for a specific learning outcome via face-to-face and online approach		4	
	3.5		
CO4. Develop assessment tools to Measure learning of prescribed outcomes within your developed course curriculum.			
LO4.1 Explain the meaning of key concepts in the assessment, such as validity, reliability, and fairness	1		
LO4.2 Explain the purpose of formative and summative assessment in the context of an OBE curriculum	.5		
LO4.3 Differentiate the effects of surface and deep approach to learning in relation to authentic assessment	.5		
LO4.4 Compare the various assessment methods with respect to the type of learning outcome it should address and its advantages and disadvantages		2	
	2		
CO5. Deliver the developed course lesson plan/instructor guide for a specific learning outcome.			
LO5.1 Explain the principle of constructive alignment in terms of course/lesson plan development	.5		
LO5.2 Discuss the approach to maximizing the learning of all students that have been	.5		

SUBJECT	ONLINE		Assigned Facilitator
	ACTIVITY SYNCHRONOUS	ACTIVITY ASYNCHRONOUS	
developed and suggested by Tom R. Vickery ODDM: A Workable Model for Total School Improvement (1988)			
LO5.3 Discuss the responsibilities of students for learning	.5		
LO5.4 Explain how Spady's (1994a:21) fundamental life performance roles may help in course development under an outcome-based educational system	.5		
LO5.5 Develop a Lesson Plan or Instructor Guide for your chosen learning outcomes using an experiential and reflective learning approach	12		
LO5.6 Reflect on your delivered course for a specific outcome and plan for improvement		10	
	14		
CO6. Design and develop a curriculum for a professional program of study leading to a relevant nationally approved qualification and certification as an officer/engineer of a merchant ship following OBE principles.		20	
LO6.1 Prepare a list of outcomes/tasks which will lead to the attainment of the various competency under a specific function of the STCW Code for OICNW or OICEW	1	4 2	
LO6.2 Analyze the list of outcomes/tasks under LO6.1 and arrange it by level descriptors (1-Introductory, 2-Enabling, and 3-Demonstrative)	.5		
LO6.3 Create course specifications/ outline/syllabus as per JCMMC 1 s2022 for courses under your developed curriculum for the specific functions under the STCW Code fo OICNW or OICEW	.5	2	
	2		
Total lecture and activity	**30**	**52**	
Total	**82**		

NOTE:

For Synchronous

- *Lecture time is provided for the presentation of the facilitator and possible Q&A*
- *Activity time is for participants activities to do the learning outcomes and possible presentation and critiquing of presentations.*

For Asynchronous

- *Asynchronous is the estimated time an individual or a small group completes an outcome for presentation using a web conferencing application (Zoom- breakout rooms)*

4. Discussion

The study is limited to the analysis, design, and development of the enhanced course for the Design, Development, and Delivery of Curriculum for Maritime Higher Educational Institutions. The complete study shall be accomplished once the pilot course has been delivered and feedback data has been gathered, analyzed, and evaluated by the participants and their immediate supervisors. This practice will allow the proponents to make the necessary revision to the course.

The addition of reflective assignments by the participants was encouraged by the IMO consultants Professor Malek Pourzanjani, and Professor Milhar Fuazudeen, provided that time is given for participants to do so. This assignment is why the synchronous delivery was designed three (3) times a week for seven weeks and only 2-3 hours of virtual classes. This strategy will allow the participants to reflect on their teaching practice and make a comparison for improvement. An additional one (1) month is given for them to submit the final outcome, which the facilitators will evaluate to determine whether they are acceptable or needs further improvement.

5. Conclusions and Recommendations

The course is ready for pilot implementation either by PAMI or within MAAP. A survey questionnaire for the participants and their immediate supervisor shall be developed and presented in the complete research paper. So, no conclusion can be derived until data from the pilot implementation is available.

It is recommended that the course be pilot implemented for the research to be finished as no statistical data is available if the developed course and its design effectively improve or enhance MHEI faculty to address the weakness and findings of the EMSA/EC report on the Philippine MET systems.

The gathered data shall be evaluated and used for possible revisions for some areas of the developed course.

6. Acknowledgements

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Deterrents, Outlooks, and Compliance
to Article III of STCW '78 Convention as Amended

Research Priority Area: **Science and Technology, Culture, and Maritime Environmental Studies - Maritime/Shipping Research**

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ABSTRACT

This study determines the deterrents, outlooks, and compliance of Filipino seafarers to Article III of STCW '78 Convention as amended. The respondents of the study are 139 merchant marine officers grouped according to their age, ranks, department, and sea experience. Descriptive-correlational method of research was used in the study. The Data were obtained through a survey method. The instrument used the Seafarers General Handicaps and Perception Questionnaires. Results show that independent samples for deterrents, outlooks, and compliance between the deck and engine and between associates and college graduates were not significant at all regardless of the type of vessels (NAS, FV, PYN-NET). However, when grouped according to ranks, between management and operational level, the following are significant: deterrents in (NAS), at $p<.05$, (FV), $p<.01$; and PYN-NET, $p<.05$ all in favor of the support level. In terms of Outlooks, all results are not significant. When grouped according to age, only the deterrent in FV is significant at $p<.05$ in favor of the younger group. In terms of sea experience, there are two outlooks that are significant: outlooks for FV at $p<.05$ in favor of shorter experience, and outlooks for PYN-NET at $p<.05$ in favor of those with shorter experience. The results of correlations among deterrents, outlooks, and compliance for NAS, FV, and PYN are all significant at $p<.05$ levels. The study concluded that the seafarer's classification seems to have insignificant applicability and satisfactory dissuasion to nullify Article III of STCW '78 as amended, and the seafarer's classification seems to sustain some desirable outlooks by fulfilling an approved seagoing service appropriate to the performance of the functions and levels that are to be stated in the certificate. The study recommends that the MARINA Administration must urge the Philippine Congress to ratify the Convention. Being a supplier of fishermen to the global fishing sector, the Philippines shall give importance to the safety of its fishermen and demonstrate its desire to improve the safety standards of its fishing vessels (MARINA FQA, 2019).

KEYWORDS: *Filipino seafarers*

1. Introduction

Filipino seafarers are one of the crucial lifeblood of the maritime shipping industry worldwide. Shipping and World Trade: Global Supply and Demand for Seafarers, International Chamber of Shipping (17-Feb-2022). The international shipping industry is responsible for the carriage of around 90% of world trade.

Shipping is the life blood of the global economy. Without shipping, intercontinental trade, the bulk transport of raw materials, and the import/export of affordable food and manufactured goods would simply not be possible.

Seaborne trade continues to expand, bringing benefits for consumers across the world through competitive freight costs. Thanks to the growing efficiency of shipping as a mode of transport and increased economic liberalization, the prospects for the industry's further growth continue to be strong.

There are over 50,000 merchant ships trading internationally, transporting every kind of cargo. The world fleet is registered in over 150 nations, and manned by over a million seafarers of virtually every nationality.

Ships are technically sophisticated, high value assets (larger hi-tech vessels can cost over US $200 million to build), and the operation of merchant ships generates an estimated annual income of over half a trillion US Dollars in freight rates.

Global Supply and Demand for Seafarers. The worldwide population of seafarers serving on internationally trading merchant ships is estimated at 1,647,500 seafarers, of which 774,000 are officers and 873,500 are ratings.

China, the Philippines, Indonesia, the Russian Federation and Ukraine are estimated to be the five largest supply countries for all seafarers (officers and ratings). The Philippines is the biggest supplier of ratings, followed by China, Indonesia, the Russian Federation and Ukraine. While China is the biggest supplier of officers, followed by the Philippines, India, Indonesia and the Russian Federation.

The global demand for seafarers is estimated at 1,545,000, with the industry requiring approximately 790,500 officers and 754,500 ratings. This indicates that the demand for officers has increased by around 24.1%, while the demand for ratings has increased by around 1.0%. The current supply-demand situation highlights a deficit of approximately 16,500 officers and a surplus of around 119,000 ratings. Although the global supply of officers is forecast to increase steadily, this development is expected to be outpaced by increasing requirement (International Chamber of Shipping, 2019).

The STCW '78 was entered into force on 28 April 1984 and since then amendments thereto have been adopted in 1991, 1994, 1995, 1997, 1998, 2004, 2006, 2010, 2014, 2015, 2016 and 2018, which still remain in force (IMO, 2019).

Deterrents. Article III – Application. The Convention shall apply to seafarers serving on board seagoing ships entitled to fly the flag of a Party except to those serving on board: (a) warships, naval auxiliaries or other ships owned or operated by a State and engaged only on governmental non-commercial service; however, each Party shall ensure, by the adoption of appropriate measures not impairing the operation or operational capabilities of such ships owned or operated by it, that the

persons serving on board such ships meet the requirement of the Convention so far as is reasonable and practicable; (b) fishing vessels; (c) pleasure yachts not engaged in trade; or (d) wooden ships of primitive build.

Outlooks. The outlooks might be warships, naval auxiliaries. However, each Party shall ensure, by the adoption of appropriate measures not impairing the operation or operational capabilities of such ships owned or operated by it, that the persons serving on board such ships meet the requirement of the Convention so far as is reasonable and practicable.

The researcher had sailed aboard BRP LD602 for three months thru the Rim of the Pacific (RIMPAC) 2018 Naval Exercise in Hawaii, USA experiencing the standing of a naval exercise observer besides in the function of a Marine Technical Adviser (MTA) of NTF86 and for the duration of five months during the *Oplan Pagbabalik* 2020 in Asia and the Middle East alike as an MTA of NTF82. The whole time, the researcher had recognized the EP who are BSMT and BSMarE theoretical graduates serving the mandatory minimum necessitated contained by Regulation II/1, Section A-II/1 Mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more as well as Table II/1, specification of minimum standard of competence. Equally is the Regulation II/3, the add-on Section A/II/3 for ships of less than 500 gross tonnage, engaged on-near coastal voyage and Table II/3, for the specification of minimum standard of competence as well. Those EP undoubtedly meet the requirement of the Convention so far as is reasonable and practicable.

Fishing Vessels

1. Section B-III Guidance regarding the application of the Convention; 1) While the definition of "fishing vessel" contained in article II, paragraph (*h*) excludes vessels used for catching fish, whales, seals, walrus or other living resources of the sea from application of the Convention, *vessels not engaged in the catching activity cannot enjoy such exclusion*. Henceforth the Convention shall apply to seafarers serving on board seagoing ships entitled to fly the flag of a Party as long as the vessel is not engaged in the catching activity.

2. The 1995 STCW-F Convention authenticates the certification and minimum training prerequisites for crews of seagoing fishing vessels of 24 meters in length and beyond. The Convention be made of 15 Articles and Annex containing technical regulations wherein Fishing vessels could be excluded in Article III. Consequently, as part of documents of evidence, every Seafarer ought to exhibit the fishing vessel's particulars he/she had been with, which specifically shows her length of 24 meters and above.

Pleasure Yachts not Engaged in Trade. Any pleasure yacht that is not engaged in trade is not required to comply with the MLC.

Nearly all Flag States, recommend that pleasure yachts not engaged in trade comply completely with the Large Yacht Code. The reason for this suggestion is essentially to provide greater safety, by virtue of the construction, equipment, operation and manning requirements of the Large Yacht Code, and this now includes MLC compliance and the many benefits that this will bring about for crew welfare and working conditions (Döhle Yachts Managing Perfections, Maritime Labour Convention. How Does it Affect Superyachts? July 2017).

Pleasure Yacht Not Engaged in Trade (PYNET) do not necessitate a Passenger Ship Safety Certificate following compliance with the requirements of the 1974 SOLAS Convention.

A Pleasure Yacht (PLY) is a yacht that is not engaged in trade, the trade being the carriage of fare paying passengers, and therefore solely used by the owner for pleasure. As soon as the yacht is used by the owner to carry fare paying passengers the yacht becomes a Commercial Yacht (CMY) and then is subject to greater regulation. And with all yachts as they increase in size the regulation increases (as per international convention) with the lower limit to be fully compliant with mandatory shipping regulation being 500GT.

The following are mandatory for all vessels: The Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs); International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating to that (MARPOL Annex I); Certificate of Registry, and Radio License.

The COLREGs are sometimes recognized as the Rules of The Road and provide an international legal structure for navigating vessels (St. Kitts & Nevis International Ship Registry, 2022).

In support of Port State Control purposes yachts can be divided in 2 categories: (1) Yachts not engaged in trade will be referred to as pleasure yachts; and (2) Yachts engaged in trade will be referred to as commercial yachts.

Commercial yachts are sanctioned for port State control and the provisions of the Paris MoU on Port State Control apply (Eligibility of Yachts to Port State Control, ParisMoU, nd).

Compliance of Warships and Naval auxiliaries. Article IX – Equivalents: (1) The Convention shall not prevent an Administration from retaining or adopting other educational and training arrangements, including those involving sea-going service and shipboard organization especially adapted to technical developments and to special types of ships and trades, provided that the level of sea-going service, knowledge and efficiency as regards navigational and technical handling of ship and cargo ensures a degree of safety at sea and has a preventive effect as regards pollution at least equivalent to the requirements of the Convention. (2) Detail of such arrangements shall be reported as early as practicable to the Secretary General who shall circulate such particulars to all Parties.

Section B-IX *Guidance regarding equivalents*. Naval certificates may continue to be accepted and certificates of service may continue to be issued to naval officers as equivalents under article IX, provided that the requirements of the Convention are met.

There are two compliance where the BSMT and BSMarE theoretical graduates could accomplish their mandatory seagoing service with the commitment of complying the 1978 STCW as Amended by the 2010 STCW Manila Amendments to the Annex: First, the Philippine Navy (PN) governing body in cooperation with the Commission on Higher Education (CHED) and the Maritime Industry Authority (MARINA), be obliged to revise their PN procedures and authorize BSMT and BSMarE theoretical graduates board their naval auxiliary vessels to perform their Traineeship for not less than 12 months as Deck or Engine Cadets or not less than 36 months as Deck or Engine ratings to obtain the mandatory minimum requirements for certification of officers in charge make notes on in Chapter II and Chapter III of the Annex to STCW Convention. In return, once they became a merchant marine officer, they would be compelled to join up the PN Reserve Force or be a Regular Naval Force Officer; Second, the governing body of the PN must recommend a law that once they come to be a naval officer through NOQC and subsequently NOCC, if ever, they ought to be permitted to officially resign, join and be a merchant marine officer by means of naval equivalent training and certificates.

The current ships of PN or the *Barko Republika ng Pilipinas* (BRP) where those BSMT and BSMarE theoretical graduates can achieve their vital seagoing service are the Major Naval Assets such as

Frigates (5+1 in Service), Corvettes (12+2 in Service), Patrol Craft (38 in Service) and Amphibious Landing Ships (11 in Service) which is undersupplied in classes of a government armed forces naval auxiliaries (Military Wiki, 2021). However, perhaps they will allow about 5 BSMT and 5 BSMarE theoretical graduates aboard those auxiliary ships from time to time after joining as PN enlisted personnel (EP) to achieve and sustain the requirements of the following: a) Chapter II, and Chapter III for Standards regarding the master and deck department and engine department respectively.

The aforesaid Article IX and Section B-IX shows the adoption of appropriate measures not impairing the operation or operational capabilities of such ships owned or operated by it, that the persons serving on board such ships meet the requisite of the Convention so far as is reasonable and practicable. Therefore, this apply to seafarers serving on board seagoing ships entitled to fly the flag of a Party and can be awarded with required certificate of seagoing service.

Fishing vessels. Fishing is one of the most endangering sectors of industry and in the world of fishing, misfortunes are mostly as a result of the lack of safety culture among fishermen. In addition to the effort by the authority to impress upon safety, discipline, and culture between fishermen, accidents do occur at a disturbing rate.

The STCW–F ‘95 be similar to the Torremolinos Protocol by setting the regulatory framework for the training and certification of fishing vessel personnel. STCW–F ’95 is the “sister” convention to the 1978 STCW Convention (Training and Certification of Seafarers), as amended in 1995, with alike requisites. The convention is the first endeavor to make safety standards for crews of fishing vessels mandatory internationally. The STCW-F Convention addresses training and certification standards for skippers and watchkeepers on fishing vessels of more than 24 m, for engineers on vessels of more than 750 kW and for crew in charge of radio communication. Vitally, it also requires basic (pre-sea) safety training for all fishing vessel personnel.

Why States should ratify the 2012 Cape Town Agreement? The Agreement has a “no more favorable treatment” clause (Article 4[7]). This means that all vessels entering a port of a State that is a party to the Agreement would be subject to the same inspection standards—even if their flag State hasn’t ratified or acceded to it. This allows States to control all vessels entering their ports, raising global safety standards.

The Fishing Vessel industry has agreements that must be regarded for the future of seafarers on board fishing vessels and be applied in STCW Convention Article III – Application.

The STCW-F 1995, which entered into force on 29 September 2012, authenticates the certification and minimum training requirements for crews of seagoing fishing vessels of 24 meters in length and above. Fishing vessels, while in the port of another Party, are subject to port State control to verify that the following persons serving on board are certified: skippers and officers in charge of a navigational watch on fishing vessels of 24 meters in length and over operating in unlimited waters; skippers and officers in charge of a navigational watch on fishing vessels of 24 meters in length and over operating in limited waters (i.e., waters within which a degree of safety is considered to exist hence the standards of qualification and certification may be lower than the ones set for the navigation in unlimited waters); those chief engineer officers and second engineer officers serving on a seagoing fishing vessel, namely vessel other than those which navigate exclusively in inland waters within, or closely adjacent to, sheltered waters or areas where port regulations apply powered by main propulsion machinery of 750 kW propulsion power or more; personnel in charge (PIC) of or performing radio-communication duties on board all fishing vessels (IMO Conventions, Codes and Amendments Mandatory requirements entering into force between 2010 and 2025, www.rina.org, November, 2013).

This can be one prospect to STCW Convention and exclusion in Article III – Application of fishing vessels especially for our Filipino seafarers on board fishing vessels, nevertheless the Philippines is not a signatory of STCW-F 1995 yet. The Philippines has more than a hundred registered fishing vessels of 24 meters or more in length, angling within Philippine waters and even foreign waters. To act in accordance with the Annex to STCW Convention as amended, the MARINA Administrator must send a letter of membership to the STCW-F through acceptance or accession. It intends to be effected by the deposit of an instrument of acceptance or accession with the Organization which shall inform all Governments that have signed the Convention or acceded to it of each new acceptance or accession and of the date of its deposit.

How to become a Party to the STCW-F? States may become Parties to the Convention by depositing an instrument to that effect with the IMO Secretary-General (IMO, 2019).

The 1995 STCW-F Convention is currently being comprehensive reviewed by the Sub-Committee on Human Element, Training and Watchkeeping with the aim of align the standards of the Convention with the current state of the fishing industry, and to make available an effective instrument, which will provide to addressing the significant challenges of this sector.

Over 50 countries have signed the "Torremolinos Declaration", indicating their determination to ratify the CTA by its tenth anniversary (to wit, 11 October 2022). Now, 16 Contracting States to the Agreement. These are: Belgium, Congo, Cook Islands, Croatia, Denmark, Finland, France, Germany, Iceland, The Netherlands, Norway, Peru, Saint Kitts and Nevis, Sao Tome and Principe, South Africa and Spain. It is still a long approach before the CTA can enter into force. Twenty-two Member States with a combined 3,600 or afar eligible fishing vessels are necessitated in succession for this Convention to enter into force.

MARINA, (2019) Frequently Asked Questions CAPE TOWN Agreement "Saving Lives Through Enhancement Of Fishing Vessel Safety" answers the ensuing queries among other things: What will be the impact of non-ratification to the Philippines? What are the obligations that the Philippine government needs to comply with upon ratification and becoming a party to the Convention? And What is the current status of the Cape Town Agreement Convention in the Philippines?

The Cape Town Agreement of 2012 allows for Administrations to exempt any vessel entitled to fly its flag from any of the requirements of this annex if it considers that the application is unreasonable and unrealistic reflecting the type of vessel, the weather conditions and the absence of general navigational hazards, provided: (a) the vessel fulfils with safety requirements which, in the opinion of that Administration, are adequate for the service for which it is intended and are such as to ensure the overall safety of the vessel and persons on board; (b) the vessel is operating solely in: (i) a common fishing zone established in adjoining marine areas under the jurisdiction of neighboring States which have established that zone, in respect of vessels entitled to fly their flags, only to the extent and under the conditions that those States correspond, in accordance with international law, to establish in this regard; or (ii) the exclusive economic zone of the State of the flag it is entitled to fly, or, if that State has not established such a zone, in an area beyond and adjacent to the territorial sea of that State determined by that State in accordance with international law and extending not more than 200 nautical miles from the baselines from which the breadth of its territorial sea is measured; or (iii) the exclusive economic zone, a marine area under the jurisdiction of another State, or a common fishing zone, in accordance with an agreement between the States concerned in accordance with international law, only to the extent and under the conditions that those States agree to establish in this regard; and (c) the Administration notifies the Secretary-General of the terms and conditions on which the exemption is granted under this paragraph (International Maritime Organization (IMO), Cape Town Agreement of 2012 on the Implementation of the Provisions of the

1993 Protocol relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, 2016).

Further, the Convention sets mandatory minimum requirements to guarantee continued proficiency and bring up-to-date of knowledge for skippers, officers, engineer officers and GMDSS radio personnel; basic safety training for all fishing vessel personnel before being assigned to any shipboard duties; and basic principles to be observed in keeping a navigational watch on board fishing vessels (IMO Conventions, Codes and Amendments Mandatory requirements entering into force between 2010 and 2025, RINA Services S.p.A, Via Corsica 12, 16128 Genova, Italy, 29-September-2012).

Pleasure Yachts not Engaged in Trade. Pleasure yachts not engaged in trade does not apply to Article 5 – Exceptions of the International Convention on Load Lines (LL Convention), (The Faculty of Law, 2022).

Yacht Categories. This is appropriate to consider two categories of yachts, identified by their use: (1) COMMERCIAL YACHTS: i.e., used as part of a business or otherwise "engaged in trade". In theory, if a yacht is engaged in trade even only occasionally, then it will be liable to inspection, according to the NIR; and (2) PLEASURE YACHTS: i.e., used exclusively as pleasure vessels by the owner, family and friends, (or Pleasure Yachts–Not Engaged in Trade).

If a yacht is a "pleasure vessel not engaged in trade", the owner must declare on the application for registration. The MCA will then provide a Certificate of Registry as a "Pleasure Yacht (not engaged in trade)" MCA on Port State Control, Mike Sanderson (2013).

Port State Control (PSC) and Yachts Engaged in Trade (YET)

Pleasure yachts possessing a Yacht Engaged in Trade Certificate of Compliance (YET COC) and operating under temporary Certificate(s) of British Registry for a Yacht Engaged in Trade (temp COBR YET) should expect to be considered by Port State Control authorities as “commercial yachts” and subject to inspection and control measures under the Paris Memorandum of Understanding.

Can a yacht can switch between Commercial Vessel and Pleasure Yacht Registration on a regular basis? Yes. However, a yacht can only be issued with one Certificate of Registry at a time. In order for the yacht to be registered as a commercial vessel it must be in possession of valid certificates appropriate to its size. For yachts over 500 GT, this includes, but is not limited to, a Safety Management Certificate, an International Ship Security Certificate, a Continuous Synopsis Record, Maritime Labour Certificate (when relevant) and a Minimum Safe Manning Document. These Certificates must remain valid for the duration of the period that the yacht remains registered as a commercial vessel. The Certificate of Registry which is not in current use must be returned to Cayman but can then be re-issued on application (Cayman Registry, 2022).

Qualification of vessel and name availability. Pleasure Yachts not engaged in Trade (Private Use): There are minimum Convention and statutory certification requisites for pleasure yachts engaged in private use and not engaged in trade. These requisites consist of completion of the appropriate sections of MARPOL 73/78 (such as IOPP and IAPP for vessels 400 gross tons or more), COLREGS, and others, depending upon the vessel’s size (Cayman Maritime Registry, 2022).

Application of the Maritime Labour Convention to Pleasure Yachts not Engaged in Trade, pleasure yachts “not engaged in trade” are not required to comply with the requirements of the Convention. It recalls that, according to its Article II, paragraph 4, the Convention applies to entirely

ships ordinarily engaged in commercial activities, including vessels chartered or hired (ILO, NORMLEX 2019).

This study aimed at looking into the deterrents, outlooks, and compliance of Filipino seafarers to Article III of the 1978 STCW Convention as Amended as well as the correlational among those variables.

The general problem of the study is "How may the vision of Filipino seafarers to Article III of STCW '78 as amended be analyzed?

Specifically, it seeks to answer the following questions:

1. How may the profile of the respondents be described in terms of: Department, Educational Attainment, Rank, Age, and Seagoing Experience?
2. How may the seafarers' deterrents, outlooks, and compliance to Article III of STCW '78 as amended be described when grouped according to profile?
3. Are there significant differences between the seafarers' deterrents to Article III of STCW '78 as amended be described when grouped according to profile?
4. Are there significant differences between the seafarers' outlooks to Article III of STCW '78 as amended be described when grouped according to profile?
5. Are there significant differences between the seafarers' compliance to Article III of STCW '78 as amended be described when grouped according to profile?
6. Is there a significant relationship between the seafarers' deterrents, outlooks, and compliance to Article III of the STCW '78 as amended?

Based on the research problem, the following hypotheses are tested in the study are:

1. There is no significant difference between the seafarers' deterrents to Article III of STCW '78 as amended be described when grouped according to profile.
2. There is no significant difference between the seafarers' outlooks to Article III of STCW '78 as amended be described when grouped according to profile.
3. There is no significant difference between the seafarers' compliance to Article III of STCW '78 as amended be described when grouped according to profile.
4. There is no significant relationship between the seafarers' deterrents, outlooks, and compliance to Article III of the STCW '78 as amended.

2. Methods

The study employed the descriptive-correlational design. The data were collected through survey method to answer questions concerning the status of the Filipino seafarers, about Deterrents, Outlooks, and Compliance of Filipino seafarers to Article III of the 1978 STCW Convention as Amended.

Descriptive research, Gay (2002) explain, involves collecting data in order to test hypothesis or answer questions concerning the current status of the subjects in the study. Descriptive research determines and reports the way things are.

Correlation research, on the other hand, attempts to determine whether, and to what degree a relationship exists between two or more quantifiable variables. The purpose of correlation research may be to establish relationship or to use relationship in making predictions. Relationship investigations typically study a number of variables believed to be related to a major and complex variable (Gay 2002).

Figure 1 presents the paradigm of the study showing the connections among the dependent and independent variables.

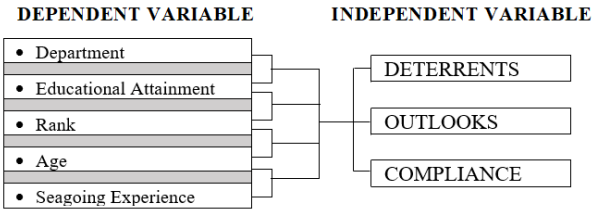

Figure 1. Paradigm of the Study

The dependent variables in this study were the Deterrents, Outlooks, and Compliance of Filipino seafarers to Article III of the 1978 STCW Convention as Amended. Meanwhile, the independent variables were the seafarer's age, educational attainment, rank, and seagoing service.

The factors considered were the current and prospective merchant marine officers, younger and older for age, and longer and shorter for sea experience.

The study covers Naval Aux Ship, Fishing Vessels, and Pleasure Yachts NET.

Both descriptive and inferential statistics were utilized. Descriptive statistics included means, standard deviations and ranks. Inferential statistics were the t-test for independent samples and the Pearson's r; Alpha level was set at .05.

The data needed for the present investigation were gathered through the use of two separate questionnaires constructed, validated, trial administered and reliability tested for the purpose.

The questionnaires were on Seafarers Deterrents (General Handicaps and Perception), and Seafarers Outlooks (Impression). The first version of Seafarers Deterrents (General Handicaps and Perception) was trial administered among 30 active seafarers sailing on both domestic and foreign itineraries. The numerical values of the responses in the trial administration were used to determine the acceptability or non-acceptability of the items based on factor loads. All of the original items in the questionnaires obtained a 0.50 or higher factor loads, which demonstrated their validity for use in this research. The reliability test of the instruments obtained the following coefficients: .897 for Seafarers Deterrents, and .737 for Seafarers Outlooks, and 0.817 for Seafarers Compliance to Article III of STCW '78 Convention as Amended.

The final forms of the questionnaires contained the following respective numbers of items: 10 items for Seafarers Deterrents, and 20 items for Seafarers Outlooks and 20 items for Seafarers Compliance. to Article III of STCW '78 Convention as Amended

The responses to the questionnaire were assigned with corresponding numerical values such that 1 is strongly disagree, 2 disagree, 3 fairly agree, 4 agree, and 5 is strongly agree. To interpret the obtained means, the following scale and descriptions were used:

	Description		
Scale	**Deterrents**	**Outlooks**	**Compliance**
1.00 – 1.49	Not Necessary	Not Good	Not
1.50 – 2.49	Slightly Necessary	Slightly Good	Slightly
2.50 – 3.49	Somewhat Necessary	Somewhat Good	Somewhat
3.50 – 4.49	Quite Necessary	Quite Good	Quite
4.50 – 5.00	Very Necessary	Very Good	Very

The participants were classified as an entire group and according to age, educational attainment, rank, and seagoing service. They were asked to accomplish the Seafarers Deterrents (General Handicaps and Perception Questionnaires).

Using Krejcie and Morgan's Table for Sample Sizes (1970), for 164 total population, 139 respondents (85%) were needed. Table 1 shows the proportional distribution of the active seafarers in this investigation.

For the purpose of this study, the active seafarers were taken as an entire group and classifications were taken as Active Seafarers; as to age, older or younger; as to educational attainment, BSMT/ANS and BSMarE/AME graduate or college graduate or undergraduate; as to rank, Management/Operation Level (Officers) or Support Level (Ratings); and as to seagoing service, shorter or longer.

Table 1. *Proportional Sampling of the Seafarer Participants*

Classification	Total Number	Proportional Samples (85%)
Active Seafarer	164	139

The questionnaires were distributed to the respondents and retrieved afterwards. Upon retrieval of the accomplished instruments, these were scored and the scores were classified, tabulated and subjected to the appropriate statistical tools via the SPSS.

3. Results and Discussions

Table 2 presents the frequency and percentage distribution of the respondents by Profile.

Table 2. *Frequency and Percentage Distribution of the Respondents by Profile*

Profile	Categories	F	%
A. Department	Deck	73	53
	Engine	66	47
B. Educational Attainment	Associate	2	01
	College	137	99
C. Rank	Management/Operational	107	77
	Support Level/Ratings	32	23
D. Age	Younger (39 yrs. old and below)	90	65
	Older (40 yrs. old and above)	49	35
E. Sea Experience	Shorter (10yrs and below)	96	69
	Longer (over 10 years)	43	31
TOTAL		139	100

Table 2 shows that 73 or 53% out of 139 respondents are from the Deck Department. The Management/operational level with 107 participants outnumbered the support level/rating that is 32. For the educational attainment, 137 or 99%t are college graduate. For the age, 90 out of 139 respondents are below 40 years old. Finally, 69% or 96 out of 139 have 10 years or even below sea experience.

Table 3 presents the summary of the mean responses of the participants both in Deterrents and Outlooks to Article III of STCW '78 as amended questionnaires. It shows that for the deterrents, the highest mean is recorded for Naval Aux Ships with mean of 4.40 while the lowest is that of Pleasure Yachts with 4.13 as its mean response. All mean ratings indicate that Deterrents to Article III of STCW '78 as amended are "Quite Necessary."

Table 3. *Mean Deterrents, Outlooks and Compliance of the Respondents*

Variables	Classifications	Mean	Descriptive Equivalent
Deterrents	Naval Aux Ships	4.40	Quite Necessary
	Fishing Vessels	4.19	Quite Necessary
	Pleasure Yachts	4.13	Quite Necessary
Outlooks	Naval Aux Ships	4.06	Quite Good
	Fishing Vessels	3.94	Quite Good
	Pleasure Yachts	3.99	Quite Good
Compliance	Naval Aux Ships	4.26	Quite
	Fishing Vessels	3.95	Quite
	Pleasure Yachts	3.97	Quite

For the outlooks, the highest mean is recorded for Naval Aux Ships with mean of 4.06 while the lowest is that of Fishing Vessels with 3.94 as its mean response. All mean ratings indicate that Outlooks to Article III of STCW '78 as amended are "Quite Good."

For the compliance, the highest mean rating is 4.26 while the lowest is 3.95. All mean ratings indicate that Compliance to Article III of STCW '78 as amended are "Quite Good."

Table 4 presents the standard deviations in deterrents, outlooks, and compliance of the seafarers to Article III of STCW '78 as amended as they are grouped according to profile.

Table 4. *Means and Standard Deviations of Deterrents, Outlooks and Compliance when Grouped according to Categories*

Profile/ Categories	Statistics	Deterrents			Outlooks			Compliance		
		NAS	FV	PYN	NAS	FV	PYN	NAS	FV	PYN
Department										
Deck	Mean	4.170	3.850	3.890	3.960	3.760	3.830	3.690	3.670	3.860
	SD	0.365	0.588	0.525	0.428	0.534	0.512	0.426	0.533	0.510
Engine	Mean	4.130	4.030	3.970	3.810	3.740	3.740	3.820	3.760	3.750
	SD	0.528	0.530	0.552	0.519	0.592	0.575	0.591	0.590	0.573
Educational Attainment										
Associate	Mean	4.500	4.500	3.970	3.700	3.880	3.900	3.760	3.860	3.960
	SD	0.707	0.707	0.050	0.431	0.177	0.148	0.430	0.187	0.146
College	Mean	4.140	3.920	3.930	3.890	3.750	3.790	3.890	3.570	3.970
	SD	0.446	0.563	0.541	0.479	0.568	0.546	0.479	0.586	0.564
Rank										
Mgt/	Mean	4.100	3.860	3.870	3.860	3.710	3.760	3.560	3.640	3.550
Operational	SD	0.474	0.612	0.585	0.501	0.605	0.583	0.670	0.614	0.670
Support	Mean	4.300	4.160	4.100	3.980	3.880	3.880	3.670	3.770	3.680
	SD	0.306	0.277	0.276	0.381	0.384	0.373	0.680	0.621	0.681
Age										
Younger	Mean	4.190	4.000	3.990	3.880	3.790	3.800	3.860	3.710	3.760
	SD	0.438	0.512	0.500	0.477	0.490	0.498	0.501	0.605	0.583
Older	Mean	4.070	3.800	3.810	3.890	3.670	3.770	3.950	3.830	3.860
	SD	0.460	0.639	0.586	0.484	0.681	0.621	0.460	0.480	0.488
Length of sea Experience										
Shorter	Mean	4.180	3.980	3.970	3.930	3.830	3.850	3.950	3.840	3.800
	SD	0.491	0.560	0.549	0.460	0.490	0.498	0.480	0.480	0.488
Longer	Mean	4.070	3.810	3.820	3.780	3.550	3.640	3.880	3.560	3.650
	SD	0.327	0.568	0.502	0.503	0.670	0.612	0.513	0.660	0.622

Examining the table yields a number of important observations. For the deterrents to Article III of STCW '78 as amended, the highest mean response is 4.500 given by the respondents classified as associate with respect to educational attainment both in Naval Aux Ships and Fishing Vessels interpreted as "Very Necessary." All other ratings fall within the range of 3.50 – 4.49 interpreted as "Quite Necessary." For the Outlooks to Article III of STCW '78 as amended, the table shows that all mean responses fall within the range of 3.50 – 4.49 interpreted as "Quite Good." Finally, the data on the Compliance to Article III of STCW '78 as amended; results reveal that all mean responses fall within the range of 3.50 – 4.49 interpreted as "Quite Good." Finally, for the compliance all other ratings fall within the range of 3.50 – 4.49 interpreted as "Quite Good."

To determine if significant differences exist in seafarers' deterrents, outlooks and compliance to Article III of STCW '78 as amended, t-test for independent samples is run in the data. Table 5 presents the summary of the results when the respondents are grouped according to department.

Table 5. *Independents Samples t-test on the Seafarers' Deterrents, Outlooks and Compliance according to Department*

	Department	Mean	SD	*t*(137)	Sig (2-tailed)
Deterrents (NAS)	Deck (N=73)	4.170	.365	.578	.564
	Engine (N=66)	4.130	.528		
Deterrents (FV)	Deck (N=73)	3.850	.588	1.895	.060
	Engine (N=66)	4.030	.530		
Deterrents (PYN-NET)	Deck (N=73)	3.890	.525	.875	.383
	Engine (N=66)	3.970	.552		
Outlooks (NAS)	Deck (N=73)	3.960	.428	1.859	.065
	Engine (N=66)	3.810	.519		
Outlooks (FV)	Deck (N=73)	3.760	.543	.189	.850
	Engine (N=66)	3.740	.592		
Outlooks (PYN-NET)	Deck (N=73)	3.830	.512	.952	.343
	Engine (N=66)	3.740	.575		
Compliance (NAS)	Deck (N=73)	3.690	.426	1.789	.075
	Engine (N=66)	3.820	.591		
Compliance (FV)	Deck (N=73)	3.670	.533	.298	.860
	Engine (N=66)	3.760	.590		
Compliance (PYN-NET)	Deck (N=73)	3.860	.510	.960	.423
	Engine (N=66)	3.750	.573		

Table 5 shows that none of the p-values (sig values) is less than .05. It means that none of the calculated t values is significant. Hence, there is no significant difference between the respondents from the Deck and Engine departments in their deterrents, outlooks, and compliance to Article III of STCW '78 as amended.

Table 6 presents the summary of the results when the respondents are grouped according to their educational attainment.

Table 6 shows that none of the p-values (sig values) is less than .05. It means that none of the calculated t values is significant. Hence, there is no significant difference between the respondents classified as associate and those that are college graduate in their deterrents, outlooks, and compliance to Article III of STCW '78 as amended.

Table 6. *Independents samples t-test on the Seafarers' Deterrents, Outlooks, and Compliance according to Educational Attainment*

	Educational Attainment	Mean	SD	*t*(137)	Sig (2-tailed)
Deterrents (NAS)	Associate (N=2)	4.500	.707	.758	.546
	College (N=137)	4.140	.446		
Deterrents (FV)	Associate (N=2)	4.500	.707	1.589	.070
	College (N=137)	3.920	.563		
Deterrents (PYN-NET)	Associate (N=2)	3.970	.050	.785	.338
	College (N=137)	3.930	.541		
Outlooks (NAS)	Associate (N=2)	3.880	.177	1.895	.067
	College (N=137)	3.750	.568		
Outlooks (FV)	Associate (N=2)	3.900	.148	.198	.805
	College (N=137)	3.790	.546		
Outlooks (PYN-NET)	Associate (N=2)	3.760	.430	.925	.433
	College (N=137)	3.890	.479		
Compliance (NAS)	Associate (N=2)	3.860	.187	1.879	.078
	College (N=137)	3.570	.586		
Compliance (FV)	Associate (N=2)	3.960	.146	.289	.806
	College (N=137)	3.970	.564		
Compliance (PYN-NET)	Associate (N=2)	3.880	.177	.900	.433
	College (N=137)	3.750	.568		

Table 7 presents the summary of the results of the independent samples t-test on the seafarers' deterrents, outlooks and compliance to Article III of STCW '78 as amended according to rank.

Table 7. Independent Samples t-test on the Seafarers' Deterrents, Outlooks, and Compliance according to Rank

	Rank	Mean	SD	t(137)	Sig (2-tailed)
Deterrents (NAS)	Mgt/Operational (107)	4.100	.474	2.250	.026*
	Support (32)	4.300	.306		
Deterrents (FV)	Mgt/Operational (107)	3.860	.612	3.810	.000**
	Support (32)	4.160	.277		
Deterrents (PYN-NET)	Mgt/Operational (107)	3.870	.585	3.034	.003**
	Support (32)	4.100	.276		
Outlooks (NAS)	Mgt/Operational (107)	3.860	.501	1.226	.222
	Support (32)	3.980	.381		
Outlooks (FV)	Mgt/Operational (107)	3.710	.605	1.861	.066
	Support (32)	3.880	.384		
Outlooks (PYN-NET)	Mgt/Operational (107)	3.760	.583	1.077	.283
	Support (32)	3.670	.373		
Compliance (NAS)	Mgt/Operational (107)	3.560	.670	1.622	.322
	Support (32)	3.670	.681		
Compliance (FV)	Mgt/Operational (107)	3.640	.614	1.681	.076
	Support (32)	3.770	.621		
Compliance (PYN-NET)	Mgt/Operational (107)	3.550	.670	1.707	.382
	Support (32)	3.680	.681		

*p<.05, **p<.01

Table 7 reveals that three p-values (sig values) are significant. Consequently, the calculated t values pertaining to those p-values are significant one at p<.05 and two at p<.01. Therefore, there was a significant difference in the deterrents to Article III of STCW '78 as amended between the seafarers grouped as Mgt/Operational (M=4.10, SD=.474) and Support (M=4.30, SD=.306) in NAS, t(137) =2.250, p<.05). Likewise, there was a significant difference in the deterrents to Article III of STCW '78 as amended between the seafarers grouped as Mgt/Operational (M=4.86, SD=.612) and Support

(M=4.16, SD=.277) in FV, t(137) =3.810, p<.01). Finally, there was a significant difference in the deterrents to Article III of STCW '78 as amended between the seafarers grouped as Mgt/Operational (M=3.87, SD=.585) and Support (M=4.10, SD=.276) in PYN-NET, t(137) =3.034, p<.01).

Looking closer into the data, seafarers classified as support have significantly higher deterrents to Article III of STCW '78 as amended that those classified as Mgt/Operational and the difference is medium based on calculated value of Cohen's effect size (d=0.50). On the other hand, seafarers classified as Mgt/Operational have significantly higher deterrents to Article III of STCW '78 as amended that those classified as support both in FV and PYN-NET and the difference is medium in both types of vessels based on calculated value of Cohen's effect size (d=0.63) and (d=0.50) respectively.

Table 8 presents the summary of the results of the independent samples t-test on the seafarers' deterrents, outlooks, and compliance to Article III of STCW '78 as amended according to age.

Table 8. Independents Samples *t*-test on the Seafarers' Deterrents, Outlooks and Compliance according to Age

	Age	Mean	SD	t(137)	Sig (2-tailed)
Deterrents (NAS)	Younger (N=90)	4.19	.438	1.551	.123
	Older (N=49)	4.07	.460		
Deterrents (FV)	Younger (N=90)	4.00	.512	2.035	.044*
	Older (N=49)	3.80	.639		
Deterrents (PYN-NET)	Younger (N=90)	3.99	.500	1.967	.051
	Older (N=49)	3.81	.586		
Outlooks (NAS)	Younger (N=90)	3.88	.477	.123	.903
	Older (N=49)	3.89	.484		
Outlooks (FV)	Younger (N=90)	3.79	.490	1.034	.304
	Older (N=49)	3.67	.681		
Outlooks (PYN-NET)	Younger (N=90)	3.80	.498	.293	.770
	Older (N=49)	3.77	.621		
Compliance (NAS)	Younger (N=90)	3.80	.498	.133	.930
	Older (N=49)	3.95	.460		
Compliance (FV)	Younger (N=90)	3.71	.605	1.430	.440
	Older (N=49)	3.83	.480		
Compliance (PYN-NET)	Younger (N=90)	3.76	.583	.293	.708
	Older (N=49)	3.86	.488		

*p<.05

The data shows that there is one p-value (sig value) less than .05 (p<.05). It indicates that there was a significant difference in the deterrents to Article III of STCW '78 as amended between the younger seafarers (M=4.00, SD=.512) and older seafarers (M=380, SD=.639) in FV, t(137) =2.035, p<.05) but the difference is small based on calculated value of Cohen's effect size (d=0.35).

Examining the data shows that younger seafarers have significantly higher deterrents to Article III of STCW '78 as amended in FV.

Table 9 presents the summary of the results of the independent samples t-test on the seafarers' deterrents, outlooks, and compliance to Article III of STCW '78 as amended according to Sea Experience.

Table 9 reveals that two p-values (sig values) are significant. Consequently, the calculated *t* values pertaining to those p-values are significant both at p<.05. Therefore, there was a significant difference in the outlooks to Article III of STCW '78 as amended between those seafarers with shorter sea experience (M=3.83, SD=.490) and those with longer sea experience (M=3.55, SD=.670) in FV,

t(137) =2.465, p=016). Likewise, there was a significant difference in the outlooks to Article III of STCW '78 as amended between those seafarers with shorter sea experience (M=3.85, SD=.498) and those with longer sea experience (M=3.64, SD=.612) in PYN-NET, *t*(137) =2.125, p=.035).

Table 9. *Independents Samples t-test on the Seafarers' Deterrents, Outlooks and Compliance according to Sea Experience*

	Sea Experience	Mean	SD	*t*(137)	Sig (2-tailed)
Deterrents (NAS)	Shorter (N=96)	4.180	.491	1.314	.191
	Longer (N=43)	4.070	.327		
Deterrents (FV)	Shorter (N=96)	3.980	.560	1.674	.097
	Longer (N=43)	3.810	.568		
Deterrents (PYN-NET)	Shorter (N=96)	3.970	.549	1.524	.130
	Longer (N=43)	3.820	.502		
Outlooks (NAS)	Shorter (N=96)	3.930	.460	1.823	.071
	Longer (N=43)	3.780	.503		
Outlooks (FV)	Shorter (N=96)	3.830	.490	2.465	.016*
	Longer (N=43)	3.550	.670		
Outlooks (PYN-NET)	Shorter (N=96)	3.850	.498	2.125	.035*
	Longer (N=43)	3.640	.612		
Compliance (NAS)	Shorter (N=96)	3.950	.480	1.823	.071
	Longer (N=43)	3.880	.513		
Compliance (FV)	Shorter (N=96)	3.840	.480	2.465	.160
	Longer (N=43)	3.560	.660		
Compliance (PYN-NET)	Shorter (N=96)	3.800	.488	2.125	.352
	Longer (N=43)	3.650	.622		

*p<.05

Looking closer into the data reveals that seafarers with shorter sea experience have significantly higher mean outlooks to Article III of STCW '78 as amended than those with longer sea experience both in FV and PYN-NET.

To examine if there is significant relationship between seafarers' deterrents, outlooks and compliance to Article III of STCW '78 as amended, Pearson Correlation test is run in the data using the IBM-SPSS. The summary of the results is shown in Table 10.

Table 10. *Pearson's Correlation Coefficients r of Seafarers' Deterrents, Outlooks and Compliance*

Deterrents	**Outlooks**			**Compliance**		
	NAS	FV	PYN-NET	NAS	FV	PYN-NET
NAS	.442**			.438**		
FV		.603**			.608**	
PYN-NET			.591**			.581**

**p<.01

The data shows that the correlation coefficients are significant at p<.01. The results show that there was a low, positive correlation between the deterrents, outlooks, and compliance to Article III of STCW '78 as amended of the seafarers in NAS. On the other hand, there was moderate positive correlation between the deterrents, outlooks and compliance to Article III of STCW '78 as amended of the seafarers in FV. Finally, there was moderate, positive correlation between deterrents and outlooks to Article III of STCW '78 as amended of the seafarers in PYN-NET.

4. Conclusions and Recommendations

Based on the results of the study, the following summary of findings are enumerated:

1. The seafarers' Deterrents to Article III of STCW '78 as amended are "Quite Necessary." Their Outlooks to Article III of STCW '78 as amended are "Quite Good." While, they are "Quite" in Compliance to Article III of STCW '78.
2. Respondents from the Deck and Engine departments have the same level of deterrents, outlooks and compliance to Article III of STCW '78 as amended. In the same manner as Associate and College Graduate respondents have the same level of deterrents, outlooks and compliance to Article III of STCW '78 as amended.
3. Seafarers classified as support have significantly higher deterrents to Article III of STCW '78 as amended that those classified as Mgt/Operational in NAS while Mgt/Operational seafarers have significantly higher deterrents to Article III of STCW '78 as amended that those classified as support both in FV and PYN-NET.
4. Younger seafarers have significantly higher deterrents to Article III of STCW '78 as amended in FV. While, Seafarers with shorter sea experience have significantly higher mean outlooks to Article III of STCW '78 as amended than those with longer sea experience both in FV and PYN-NET.
5. Low, positive correlation between seafarers' deterrents, outlooks and compliance to Article III of STCW '78 as amended in NAS while moderate positive correlation between the seafarers' deterrents, outlooks and compliance to Article III of STCW '78 as amended in FV as well as those in PYN-NET.

Based on the findings enumerated, the following conclusions are drawn:

1. The seafarer classification seemed to have insignificant applicable and satisfactory dissuasion to nullify Article III of STCW '78 as amended.
2. The seafarer classification seemed to sustain some desirable outlooks by fulfilling an approved seagoing service appropriate to the performance of the functions and levels that are to be stated on the certificate. The minimum duration of seagoing service shall be equivalent to the duration of seagoing service prescribed in chapters II and III of the annex. However, the minimum duration of seagoing service shall be not less than as prescribed in the STCW Code.
3. The seafarer classification seemed to support some required degree of compliance. Though non-commercial vessels are excluded in STCW '78 as cited in Article III, however in order to achieve full compliance by' January 2017, it is necessary for Parties to promptly begin taking appropriate measures to implement the STCW Convention and Code in their national training, certification and administration systems.
4. The seafarers (officers and ratings) appeared to be correlated with deterrents, outlooks and compliance to Article III of the STCW '78 as amended. As stated, Section B-IX, Guidance regarding equivalents. Naval certificates may continue to be accepted and certificates of service may continue to be issued to naval officers as equivalents under article IX, provided that the requirements of the Convention are met.

Following are the recommendations on the basis of the data obtained for this investigation:

1. The MARINA Administration must urge the Philippine Congress to ratify the Convention. Being a supplier of fishermen to the global fishing sector, the Philippines shall give importance to the safety of its fishermen and demonstrate its desire to improve the safety standards of its fishing vessels (MARINA FQA, 2019).
2. The Administration may
   2.1. may ask the Philippine Navy top echelon to revise its recruitment processes, admit all graduates of BSMT and BSMarE, and allow them to complete their required seagoing

service of not less than 12 months as Cadet or not less than 36 months as rating and sequentially be a merchant marine officer in accordance to Regulation II/1 and III/1 of STCW '78 Convention or be a naval officer as they wish.

2.2. may ask the Philippine Congress to be a signatory of The International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F 1995), which enter into force on 29 September 2012; propose a joint venture of financing-purchasing-operation of a seagoing training ship under a memorandum of agreement (MOA) with the non-local government unit or stakeholders could, so as to provide a required seagoing service to all maritime courses graduates that would enhance the country's maritime industry; and

2.3. may issue a guidance that every Pleasure Yacht may register and seek a certificate of International Load Line Convention because it goes on to conclude that if a yacht is issued with a certificate issued under the International Load Line Convention or is marked according to the Convention with Load Line marks on the sides, then this indicates the vessel may be "engaged in trade".

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An Evaluation of Physical Fitness 1 Module: Basis for Improvement

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The main objective of the study is to evaluate the Physical Fitness 1 module authored by Mr. Baligad and Dr. Dela Cruz. The evaluation utilized both qualitative and quantitative data. The module was created when the Maritime Academy of Asia and the Pacific, like any other tertiary institution, adjusted to the new normal of preventing the face-to-face teaching-learning process and shifted to online learning. The evaluation focused on the Quality of the Content, Presentation, and Effectiveness. The respondents consist of 10 instructors corresponding to experts' evaluation and 66 midshipmen who used the module during the first semester of the academic year 2020 – 2021. The results show that instructors' numeric evaluation on the module falls within the range of 4.50 – 5.00 interpreted as "Strongly Agree" in all areas evaluated. Meanwhile, midshipmen's numeric evaluation falls within the range of 3.50 – 4.49, interpreted as "Agree"in all areas evaluated. In addition, there are significant differences between the numeric evaluation by the instructors and by the midshipmen both on the Quality of the Content and Effectiveness but no significant difference between the numeric evaluation by the instructors and by the midshipmen on the Presentation of the module. The respondents commented that the module 'is easy to understand and helps attain personal physical fitness, especially during this kind of time.' On the other hand, suggestions for improvement include that 'the images must be in high resolution so that it is not pixelated.'

KEYWORDS: *Quality of the Content, Effectiveness*

1. Introduction

The concern of the COVID 19 outbreak started in the latter part of 2019 and escalated later to a worldwide pandemic. Health protocols in all sectors must be adapted and implemented to ensure the containment of the virus. The education sector is greatly affected by the pandemic resulting from the shift from face-to-face classroom-based instructions to the online teaching-learning process.

The education sector made huge adjustments to cope with the restrictions brought about by the COVID 19 pandemic. The adjustments not only include the shift to online learning but changes in the subjects and course offerings as well. For instance, the Maritime Academy of Asia and the Pacific (MAAP) cannot offer "swimming" in PE classes as applications of minimum health protocols are impossible. Hence, the academy offers a Physical Fitness course instead of Swimming.

The quality of education must not be sacrificed as face-to-face interaction between the teacher, and the students is impossible. Proper teaching materials are needed to be used to increase the chance of success. MAAP was quick to respond to the new normal and do an educational module in all courses it offers in the current semester. Kristie Sweet (posted in Classroom.synonym.com) defined educational modules as an instructional unit that focuses on a particular topic. Although the details and activities vary according to the specific context, such as course and student level, most educational modules include information about the topic, focus on student-centered learning activities and culminate in a project for students to demonstrate understanding. Physical Education, one of the courses offered by MAAP, shifted its content from Swimming to Physical Fitness. A module in Physical Fitness is written by Mr. Baligad and Dr. Dela Cruz. The module is named as Challenged-Based Learning Module in Physical Fitness 1.

Physical fitness refers to the ability of your body systems to work together efficiently to allow you to be healthy and perform activities of daily living. Being efficient means doing daily activities with the least effort possible. A fit person is able to perform schoolwork, meet home responsibilities, and still have enough energy to enjoy sports and other leisure activities. A fit person can respond effectively to ordinary life situations, such as raking leaves at home, stocking shelves at a part-time job, and marching in the band at school. A fit person can also respond to emergencies - for example, by running to get help or aiding a friend in distress. (Human Kinetics, n. d.)

The module covers both health-related and skill-related fitness exercises. The objective of this research is to evaluate the Physical Fitness 1 module. The scope of evaluation includes Content and Quality, Design and Presentation, and effectiveness. The evaluation was conducted during the first semester of 2020 – 2021. The results could be the basis for future improvements in the module.

The general problem of the study is "How may the Physical Fitness 1 Module be evaluated?"

Specifically, it sought answers to the following questions:

1. How may the respondents evaluate the Physical Fitness 1 module in terms of (1.1) Quality of the Content, (1.2) Design and Presentation, and (1.3) Effectiveness;
2. How may the evaluation in physical fitness 1 module be described when respondents are grouped as instructors and midshipmen in terms of (2.1) Quality of the Content, (2.2) Design and Presentation, and (2.3) Effectiveness;
3. Is there a significant difference between the instructors' and midshipmen's evaluation on the Physical Fitness 1 module?;
4. What are the comments and suggestions of the respondents on the Physical Fitness 1 Module?

In line with the statements of the problems, the hypothesis tested in the study is “there is no significant difference between the instructors’ and midshipmen's evaluation of Physical Fitness 1 module”.

Related Literature and Studies. COVID-19 has become a global health crisis. According to UNESCO (2020), to curb the spread of COVID-19, most governments have opted to employ quarantine protocols and temporarily shut down their educational institutions. As a consequence, more than a billion learners have been affected worldwide. Among this number are over 28 million Filipino learners across academic levels who have to stay at home and comply with the Philippine government’s quarantine measures. (cited by Joaquin, Biana, and Dacela, 2020)

To respond to the needs of learners, especially of the 3.5 million tertiary-level students enrolled in approximately 2,400 HEIs, certain HEIs in the country have implemented proactive policies for continuing education despite the closure. These policies include modified forms of online learning that aim to facilitate student learning activities. (Joaquin, Biana, and Dacela, 2020)

Modules have been a household term for delivering learnings amidst the COVID 19 pandemic. According to DepEd (2019) learning modules are printed or non-printed materials that guide both the teachers and the learners through the content of and learning activities for a subject matter. On the other hand, boisestate.edu (n. d.) defines a module as a unit, chapter, topic, or segment of instruction. Module is a standard unit or instructional section of your course that is a “self-contained” chunk of instruction. The boisestate.edu emphasizes that a module structure is essential in online learning environments, as it provides an aid in the Presentation and application of the online teaching and learning process. When students are aware of the structure of the course, they spend less time guessing what is expected of them and more time focusing on the content and activities. Finally, lss.at.ufl.edu/ (2013) explained that a learning Module is a tool that provides course materials in a logical, sequential, order, guiding students through the content, and assessments in the order specified by the instructor. Instructors can insert formatted text, files, weblinks, discussion topics, assignments, tests and quizzes, and soon, assessments. Content can be structured in such a way as to require students to complete content before they are allowed to proceed to the following content. It is also possible for instructors to set up a place for students to add content to the Learning Module.

Many literatures suggest that evaluation of learning modules is a crucial step to ensure the quality of the teaching-learning process.

A leaflet from Queen Margaret University stated that module evaluation refers to the formal and informal processes of collecting feedback from students on the relevance, Effectiveness and efficiency of the module. Student evaluation provides first-hand information to underpin changes to the module that could further enhance the student experience. Positive student experiences can be used to celebrate and promote the module. In contrast, negative experiences provide the impetus for considering how specific aspects of the module could be redesigned to enhance the student experience. (www.sparqs.ac.uk)

A fundamental principle on student evaluation of module policy of the Cardiff Metropolitan University states that the primary purpose of student module evaluation is to assure the quality of learning, teaching and assessment and to enhance the student experience.

Willmot and Perkin (2015) conducted a study that focused on the evaluation of the new first-year module, Engineering Principles and Professional Skills (EPPS). The module is delivered to approximately 150 first year mechanical engineering undergraduates. It is based on four student-centered inquiry-based learning (EBL) assignments of different styles and duration and a program of appropriate skills workshops. Conventional end-of-module feedback is obtained routinely for all

modules in the Wolfson School of Mechanical and Manufacturing Engineering. The results showed that the members of staff and students who contributed to this evaluation viewed the module as having a positive effect on both student engagement and the development of student team working skills. Students also claim that they improve their practice and study skills and talk of the value of real-world applications of technology that are in great demand by employers yet all too often lacking in graduates.

Auditor and Nava (2014) conducted a study whose primary purpose was to develop and validate modules in physics based on selected least mastered competencies for tenth-graders. Hence, the researcher developed a set of modules that covered six major areas of physics. The development and validation were anchored to the ADDIE model, which involved four stages: preparation, development, validation, and try-out. Select physics experts from Philippine Normal University and teachers from Tibagan High School in the Philippines were the sample used to validate the modules, which were further tried out on 96 students of Tibagan High School. The result of the study showed that the developed modules were found acceptable for the 10^{th}-grade physics students. In addition, there was no statistically significant difference between the evaluation of the students, peers, and experts on the module's acceptability. Also, the developed set of modules was found to be effective in terms of knowledge acquisition.

2. Methods

The study made use of a descriptive research design. Jovancic (2020) defined descriptive research as a research method used to describe the phenomenon that's being studied. The main focus of descriptive research is on the "what" rather than the "why." In other terms, it only describes the research topic without explaining why it is like that. McCombes (2019) explained that descriptive research is an appropriate choice when the research aim is to identify characteristics, frequencies, trends, and categories.

That data was gathered through a survey method. Check and Schutt (2012) define survey research as the collection of information from a sample of individuals through their responses to questions. Singleton and Straits (2009) on the other hand, emphasized that survey research allows for a variety of methods to recruit participants, collect data, and utilize various methods of instrumentation. Survey research can use quantitative research strategies such as questionnaires with numerically rated items, qualitative research strategies as in open-ended questions, or both strategies in mixed methods. As it is often used to describe and explore human behavior, surveys are therefore frequently used in social and psychological research. (cited by Ponto, 2015)

The data were collected through an online survey questionnaire. The items in the questionnaire were adapted from the research of Dela Cruz (2017). It was pilot tested on 15 respondents not included in the study. The reliability is measured using the Siegle-Reliability Calculators. The calculated Cronbach alpha coefficient for Quality of the Content is 0.96; for Design and Presentation, the calculated Cronbach alpha coefficient is 0.93; and for Effectiveness, the calculated Cronbach alpha coefficient is 0.92. All are interpreted as having "Excellent" internal consistency.

The data were collected, tallied, and analyzed to interpret, draw findings, and conclude.

3. Results

The presentation of results follows the sequence of the statement of the problem.

Table 1 presents the frequency and means distribution of ratings given by the respondents in the Physical Fitness 1 module in terms of content and quality. The respondents consist of 66 midshipmen and ten instructors.

Table 1. *Frequency and Mean Distribution of Ratings of the Respondents in Physical Fitness 1 Module in terms of Quality of the Content.*

Quality of the Content	5	4	3	2	1	Mean	Descriptive Equivalent
1. The content of the module matches the learning outcomes of the course.	34	38	4	0	0	4.39	Agree
2. The topics are aligned with the scope stated in the module.	32	42	2	0	0	4.39	Agree
3. The sample physical exercises are focused and specific to the scope stated in the module.	37	35	4	0	0	4.43	Agree
4. The contents of the module are correct and accurate.	36	31	9	0	0	4.36	Agree
5. The contents of the module are valid and relevant.	28	43	5	0	0	4.30	Agree
6. The contents of the module are current and timely.	33	38	5	0	0	4.37	Agree
7. The physical exercises are sufficient and adequate to cover the topics stated in the module.	30	41	5	0	0	4.33	Agree
8. The time allotted for each topic is appropriate.	28	40	4	0	0	4.11	Agree
9. The module presents opportunities for task-based learning.	34	36	6	0	0	4.37	Agree
10. The physical exercises in the module are suitable for self-directed learning.	30	41	5	0	0	4.33	Agree
					Overall Mean	4.34	High

Scale: 1.00 – 1.49 = Strongly Disagree (Very Low); 1.50 – 2.49 = Disagree (Low); 2.50 – 3.49 = Tends to Agree (Moderate); 3.50 – 4.49 = Agree (High); 4.50 – 5.00 Strongly Agree (Very High)

Table 1 reveals that all the items for quality and content got mean ratings that fall within the range of 3.50 – 4.49 interpreted as "Agree." The item with the highest mean rating of 4.43 is item number 3. The respondents agree that "the sample physical exercises are focused and specific to the scope stated in the module." Items 1 and 2 got the second highest mean, which was 4.39. The respondents "agree" that 'the content of the module matches the learning outcomes of the course' and that 'the topics are aligned with the scope stated in the module.' The item with the lowest mean rating is item number 8 with a rating of 4.11 still interpreted as "Agree." The overall rating is 4.34 interpreted as "High." The result indicates that Physical Fitness 1 module has "High" quality of the content.

Table 2 presents the frequency and mean distribution of ratings given by the respondents in Physical Fitness 1 module in terms of presentation.

Table 2. *Frequency and Mean Distribution of Ratings of the Respondents in Physical Fitness 1 Module in terms of Presentation*

Presentation	5	4	3	2	1	Mean	Descriptive Equivalent
1. The font size and type used in the module were appropriate.	27	36	11	2	0	4.16	Agree
2. The sizes of the pictures and illustrations in the module are appropriate.	29	36	9	2	0	4.21	Agree
3. The figures, diagrams and illustrations made the module appealing and interesting.	25	40	10	1	0	4.17	Agree
4. The topics and physical exercises in the module are well organized.	29	41	5	1	0	4.29	Agree
5. The instructions and requirements in the module are easily understood.	31	40	5	0	0	4.34	Agree
					Overall Mean	4.23	High

Table 2 reveals that all the items for the presentation got mean ratings that fall within the range of 3.50 – 4.49 interpreted as "Agree." The item with the highest rating of 4.34 is item number 5. It states that "the instructions and requirements in the module are easily understood." It is followed by item no 4 stating that "the topics and physical exercises in the module are well organized." The overall mean is 4.23 which indicates that the respondents gave "High" ratings on how the module is presented.

Table 3 presents the frequency and mean distribution of ratings given by the respondents in Physical Fitness 1 module in terms of effectiveness.

Table 3. *Frequency and Mean Distribution of Ratings of the Respondents in Physical Fitness 1 Module in terms of Effectiveness.*

Effectiveness	5	4	3	2	1	Mean	Descriptive Equivalent
1. The figures, diagrams and illustrations encourage the students to read and study the module.	28	38	10	0	0	4.24	Agree
2. The module allows the students to think independently.	35	39	1	1	0	4.42	Agree
3. The module allows the students to learn at their own level of ability.	31	40	5	0	0	4.34	Agree
4. The module is written at a level suitable for students' understanding.	33	37	6	0	0	4.36	Agree
5. The language used in the module is appropriate for the students' level of understanding.	33	38	5	0	0	4.37	Agree
				Overall Mean		4.35	High

Table 3 shows that all the items for the effectiveness got mean ratings that fall within the rage of 3.50 – 4.49 interpreted as "Agree." The item with the highest mean rating is number 2, which states that "the module allows the students to think independently." The next item getting the second highest mean rating is item number 4 stating that "the module is written at a level suitable for students' understanding." The overall mean is 4.35 which indicates that the respondents "Agree" that the module is effective.

Table 4 presents the comparative ratings given by the respondents when they are grouped into instructors and midshipmen.

Table 4. *Mean Ratings of the Respondents Grouped as Instructors and Midshipmen*

Areas of Evaluation	Instructors (N = 10)	Midshipmen (N = 66)
Content and Quality	4.70 (Very High)	4.49 (High)
Presentation	4.50 (Very High)	4.19 (High)
Effectiveness	4.72 (Very High)	4.29 (High)

Scale: 1.00 – 1.49 = Strongly Disagree (Very Low); 1.50 – 2.49 = Disagree (Low); 2.50 – 3.49 = Tends to Agree (Moderate); 3.50 – 4.49 = Agree (High); 4.50 – 5.00 Strongly Agree (Very High)

Table 4 reveals that the Instructors' numeric evaluation on the module falls within the range of 4.50 – 5.00 interpreted as "Very High". Consequently, the instructors gave "Very High" ratings on the quality of the content of the Physical Fitness 1 module; as well as on how the lessons, topics, exercises, and illustrations are presented; and that the module is very much effective in making the students study, and makes them learn independently.

On the other hand, the midshipmen's numeric evaluation fall within the range of 3.50 – 4.49 interpreted as "High.". It means that the midshipmen have "High" ratings on the quality of the content of the Physical Fitness 1 module; as well as on how the lessons, topics, exercises, and illustrations are

presented; and that the module is highly effective in making the students study, and makes them learn independently.

To test the hypothesis, Mann-Whitney U test is run in the data using the SPSS. Table 5, 6, and 7 present the summary of the results on Quality of the Content, Presentation, and effectiveness respectively.

Table 5. *Summary of the Mann-Whitney test on the Quality of Content of Physical Fitness 1 Module*

Respondents	N	Median	SD	Mann-Whitney (U)	*z*	*p*	Decision
Instructors	10	4.80	0.32	183.00	2.28	.023	Reject the Null
Midshipmen	66	4.10	0.50				Hypothesis

Table 5 shows that the p-value = .023 associated with the Mann-Whitney U of 183.00, which is less than .05 indicating that it is significant. Accordingly, there is a significant difference between the numeric evaluation by the instructors (median = 4.80) and by the midshipmen (median = 4.10). Looking closer into the data, the instructors gave statistically higher numeric evaluation on the Quality of the Content of the Physical Fitness 1 module. The results are similar to the findings of Auditor, E and Nava, D. J. (2014) that there was no statistically significant difference between the evaluation of the students, peers, and experts on the module.

Table 6. *Summary of the Mann-Whitney test on the Presentation of Physical Fitness 1 Module*

Respondents	N	Median	SD	Mann-Whitney (U)	z	p	Decision
Instructors	10	4.70	0.51	243	1.37	0.171	Retain the Null
Midshipmen	66	4.00	0.56				Hypothesis

Table 6 reveals that the p-value = .171 associated with the Mann-Whitney U of 243.00, which is greater than .05 indicating that it is not significant. Accordingly, there is no significant difference between the numeric evaluation by the instructors (median = 4.70) and by the midshipmen (median = 4.00). Consequently, numeric evaluation by the instructors and by the midshipmen are statistically the same on the presentation of the Physical Fitness 1 module. The results contradicts the findings of Auditor, E and Nava, D. J. (2014) that there was no statistically significant difference between the evaluation of the students, peers, and experts on the module.

Table 7 shows that the p-value = .011 associated with the Mann-Whitney U of 169.00, which is less than .05 indicating that it is significant. Accordingly, there is a significant difference between the numeric evaluation by the instructors (median = 4.90) and by the midshipmen (median = 4.00). Looking closer into the data, the instructors gave statistically higher numeric evaluation on the Effectiveness of the Physical Fitness 1 module. The results are similar to the findings of Auditor, E and Nava, D. J. (2014) that there was no statistically significant difference between the evaluation of the students, peers, and experts on the module.

Table 7. *Summary of the Mann-Whitney test on the Effectiveness of Physical Fitness 1 Module*

Respondents	N	Median	SD	Mann-Whitney (U)	z	p	Decision
Instructors	10	4.90	0.38	169	2.54	.011	Reject the Null
Midshipmen	66	4.00	0.53				Hypothesis

Comments of the instructors include the following: very good documentation; the module is well organized and suitable for the class set up during pandemic; and illustrations and pictures are easy to follow and very helpful for students, among others. On the other hand, comments of the midshipmen include: the module is easy to understand; the module was helpful in attaining personal physical fitness especially during this kind of time; the activities are appropriate especially during this time of Pandemic; The module provides everything expected and needed from it; the module is very

informative; it helps us to learn the physical exercises just be looking at this; and students can learn easily through this.

Finally, the instructors and students made the following suggestions to improve the module: image must be in high resolution so that it is not pixelated; Improvement may be done on the layout of the text and graphics; and kindly incorporate more picture and clearer pictures of the exercises; and other similar suggestions.

5. Conclusions and Recommendations

Based on the results of the study, the following conclusions are drawn:

1. The instructors gave statistically higher numeric evaluation on the Quality of the Content of the Physical Fitness 1 module.
2. The numeric evaluation by the instructors and by the midshipmen are statistically the same on the presentation of the Physical Fitness 1 module.
3. The instructors gave statistically higher numeric evaluation on the Effectiveness of the Physical Fitness 1 module.

The researcher recommends the following:

1. Continue to use the module while the pandemic prevents the conduct of the team sports in the Physical Education (PE).
2. Look into the comments and suggestions of the respondents and use them to improve the module.

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Relevance and Usability of Module in Physical Education IV

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The study aims to evaluate the PE 4 module of the Maritime Academy of Asia and the Pacific (MAAP). The module covers team sports, specifically basketball and volleyball. The evaluators are seven (7) instructors who are experts in writing modules and other teaching materials. The evaluation focused on relevance and usability. The instrument used by the respondents is the standard questionnaire provided by the Academic Research Unit (ARU) of MAAP. The results show that PE 4 module is highly rated in terms of relevance and usability. It is recommended that future research be conducted to evaluate students' acceptability and satisfaction.

KEYWORDS:

Module evaluation, Experts' opinions, Students' acceptability, Satisfaction

1. Introduction

Physical Education (PE) is part of the Philippine education curriculum. It's one of the compulsory core subjects in both Elementary and Secondary schools.

At the tertiary level, Physical Education (PE), as per RA 5708 and National Service Training Program (NSTP) and RA 9163, is required to be taken by all students (Biglete, 2017).

One of the PE courses offered in college is Team Sports. The subject is designed to assist students in refining basic skills, reviewing strategies and techniques, and updating on new rules and regulations in selected team sports. Emphasis is allotted to sports leadership and management. Different types of tournament formats are discussed and used. An inter-class tournament where students will be officiating and competing culminates in the subject. The subject includes knowledge, skills and attitudes necessary to enjoy and sustain a physically active and healthy lifestyle. (CHED, 2018)

Team sports are about so much more than their physical benefits. Especially when group sports activities are incorporated into a young person's life. Studies have shown a direct correlation between physical activity and academic performance. (Maslen, 2015)

The Maritime Academy of Asia and the Pacific (MAAP) ensures quality education. Quality education means that all elements in the delivery of instruction are guaranteed to be of quality. These factors include the human and non-human elements of physical elements comprising the teaching materials, equipment, and infrastructure.

Many works of literature have enumerated and proposed countless instructional designs that have been proven effective against traditional teacher-centered instructional design.

Modular instruction is an alternative instructional design. Modular instruction uses developed instructional materials which are based on the needs of the students. Students are encouraged to work on various activities that are interesting and challenging to maintain focus and attention (Cruickshank, D. et al. 2003, cited by Nardo in 2017)

MAAP prepares modules in all courses to aid and enhance the delivery of instruction. A module in PE 4 was written by Mr. Mascardo. The module focused on team sports specifically, basketball and volleyball.

Bethell and Morgan (2011) made a study entitled Problem-based and Experiential Learning: Engaging Students in an Undergraduate Physical Education Module. Focus groups investigate the students' and tutors' responses to the teaching approach. The results indicated that the teaching method is associated with students feeling confident about their critical knowledge and understanding of contemporary issues in PE, their presentation and discussion skills, and a positive engagement with the module. Overall, the approach was highly beneficial to the student learning experience.

Vidal, Berdan, De Rosas, and Go (2021) studied the development and acceptability of the instructional module in arnis in physical education. The respondents of the survey were twenty (20) physical education instructors. It utilizes the descriptive research method, which involves the description, recording, analysis, and interpretation of the present nature, composition or process of phenomena. Results show that the development and acceptability of the instructional module in arnis in physical education at the University of Rizal in terms of age, sex, campus and length of service is well accepted concerning objectives, contents, clarity and usefulness.

The study of Vidal, Berdan, De Rosas, and Go (2021) is somewhat comparable to this study. Both studies are concerned with measuring how the modules may help in Physical Education. In addition, both focused on experts' evaluation.

The results of this study may be used by other module authors to improve and enhance their outputs.

This study aims to have experts evaluate the module in Physical Education (PE) 4 written by Mr. Mascardo. The evaluation covers the module's relevance and usability.

The general problem of the study is "How may the Module in Physical Education 4 be evaluated?

Specifically, it sought answers to the following questions:

1. How may the respondents describe the relevance and usability of Module in Physical Education 4 in terms of: Appropriateness/Fitness for Purpose, Relevance to discipline, Effectiveness, Efficiency, and Satisfaction?
2. What are the respondents' thoughts about the Module in Physical Education 4 in terms of: what they like best, what they like least, and Comments and suggestions?

2. Methods

The study is descriptive research. Aggarwal and Ranganathan (2019) stated that descriptive research design allows the researcher to study and describe the distribution of one or more variables.

Data is utilized through the survey method. Survey research, according to Check & Schutt (2012), is "the collection of information from a sample of individuals through their responses to questions" (cited by Ponto, 2015). The instrument used in the study is the questionnaire provided by MAAP's Academic Research Unit (ARU). The study's respondents include seven (7) instructors who are experts in writing teaching material, including modules.

Copies of the PE 4 Module together with the questionnaire are sent to each respondent through email. Responses are sent back. Data were tabulated, analyzed, and interpreted.

3. Results and Discussions

The relevance and usability of the PE 4 module are evaluated. Table 1 presents the summary of the PE 4 module in terms of appropriateness or fitness for the purpose.

Table 1 shows that 7 out of 8 items garnered average scores within the range of 4.50 to 5.00. It means that the respondents "Strongly Agree" with those items. The standard deviations were minor, indicating that the scores in those items were not widely dispersed. Meanwhile, the respondents gave item 8 an average score of 4.14 with a substantial standard deviation as compared to the rest of the items, which indicates that they "Agree." The overall mean is 4.61, interpreted as "Very High." Consequently, it can be inferred from the data that the respondents "Strongly Agree" that PE 4 module is appropriate or fit for the purpose.

Table 1. *Appropriateness/Fitness for the Purpose of PE 4 Module*

Items	Mean	SD	Descriptive Equivalent
1. Supports the realization of the general objectives of the course.	4.57	0.53	Very High
2. Satisfies the curriculum requirement.	4.57	0.53	Very High
3. States the possible skills to be acquired by the students upon successful	4.71	0.49	Very High
4. Addresses skills or technical procedures needed in the subject.	4.57	0.53	Very High
5. Defines clearly its purpose in line with the subject areas.	4.71	0.49	Very High
6. Is in-depth and enhances the conceptual understanding, and engages higher	4.71	0.49	Very High
7. Is free from bias.	4.86	0.38	Very High
8. Promotes manipulation of data and digital information, and encourages personal improvement.	4.14	0.90	High
Overall	4.61	0.54	Very High

Scale: 1.00 – 1.49 = Strongly Disagree (Very Low); 1.50 – 2.49 = Disagree (Low); 2.50 – 3.49 = Moderately Agree (Moderate); 3.50 – 4.49 = Agree (High); 4.50 – 5.00 Strongly Agree (Very High)

Table 2 presents the summary of the PE 4 module in terms of relevance to Discipline.

Table 2. *Relevance to Discipline of PE 4 Module*

Items	Mean	SD	Descriptive Equivalent
1. Aids in sharpening analytic skills needed in the course.	4.33	0.52	High
2. Aids in solving real-life situations in the lessons.	4.17	0.75	High
3. Aids in having appropriate activities for the students.	4.86	0.38	Very High
4. Aids in applying activities to a diversity of student abilities, interests and	4.14	1.07	High
5. Makes connection of the course with the Discipline.	4.71	0.49	Very High
Overall	4.44	0.64	High

The results indicate that item 3 garnered a “Very High” mean of 4.86, followed by item 5 with 4.71. In effect, the respondents “Strongly Agree” that the PE 4 module Aids in having appropriate activities for the students and Makes a connection of the course with the Discipline. The rest of the items got “High” means. Item 4 has the most significant standard deviation indicating that the respondents’ ratings are dispersed. The overall mean is 4.44, interpreted as “High.” Hence, the respondents “Agree” that PE 4 module is relevant to the Discipline.

Table 3 summarizes the ratings given by the respondents on the effectiveness of the PE 4 module.

Table 3. *Effectiveness of PE 4 Module*

Items	Mean	SD	Descriptive Equivalent
1. Shows usefulness in understanding the different concepts of the subject.	4.43	0.79	High
2. Helps in responding to the students‘ need to understand the subject.	4.71	0.49	Very High
3. Serves as valuable and practical instructional material.	4.86	0.38	Very High
4. Adapts to students‘ interests and abilities.	3.86	0.90	High
5. Communicates knowledge and ideas effectively.	4.43	0.53	High
Overall	4.46	0.62	High

Item 4 garnered a “Very High” mean of 4.86 with a relatively small standard deviation. It means that the respondents “Strongly Agree” that PE 4 module Serves as valuable and practical instructional material. The rest of the items got “High” means. The overall mean of 4.46 indicates that the evaluators “Agree” that PE 4 module is practical.

Table 4 presents the summary of the rating given by the respondents on the efficiency of the PE 4 module.

Table 4. *The Efficiency of the PE 4 Module*

Items	Mean	SD	Descriptive Equivalent
1. It is designed to support ease of learning.	4.71	0.49	Very High
2. Strengthens the learning interests of the students.	4.71	0.49	Very High
3. Encourages the student to work at his own pace.	4.43	1.13	High
4. Reinforces the transfer of learning.	4.29	0.76	High
5. Encourages students to complete the given task.	4.29	0.76	High
OVERALL	**4.49**	**0.73**	**High**

The results show that the first two items garnered "Very High" with relatively low standard deviations. Consequently, the respondents "Strongly Agree" that the PE 4 module is designed to support ease of learning and strengthens the learning interests of the students. The rest of the items were rated as "High." The overall mean of 4.49 indicates that the evaluators "Agree" that the PE 4 module is efficient.

Table 5 presents the satisfaction ratings given by the respondents in PE 4 module.

Table 5. *Satisfaction with PE 4 Module*

Items	Mean	SD	Descriptive Equivalent
1. Offers meaningful experiences to the learners in learning the lessons.	4.71	0.49	Very High
2. Provides valuable information, graphics and illustrations to better understand the lessons.	4.57	0.53	Very High
3. Develops new knowledge and skills.	4.57	0.53	Very High
4. Stimulates enthusiasm for further learning.	4.14	0.69	High
5. Presents intellectually stimulating learning activities.	4.29	0.49	High
OVERALL	**4.46**	**0.55**	**High**

The first three items garnered "Very High" mean ratings. Item 1 got the highest mean of 4.71, with the most minor standard deviation. Consequently, the respondents "Strongly Agree" that the PE 4 module Offers meaningful experiences to the learners in learning the lessons. Similarly, the respondents "Strongly Agree" that PE 4 module provides valuable information, graphics and illustrations to understand the tasks better and develops new knowledge and skills. The overall mean of 4.46 indicates that the respondents gave a "High" rating to the satisfaction with the PE 4 module.

The findings of the study are comparable to the results obtained by Vidal, Berdan, De Rosas, and Go (2021). The said study claimed that the evaluated module is well accepted concerning objectives, contents, clarity and usefulness. This study shows that PE 4 module is highly rated in terms of relevance and usability.

In the last part of the questionnaire, the respondents answered open-ended questions and wrote comments and suggestions on the last part of the questionnaire. The summary is shown in Table 6.

Table 6. *Respondents' Thoughts about PE 4 Module*

Questions	Respondents' Answers
What do you like best about the instructional material?	➢ The illustrations and the citation for the images ➢ The pictures ➢ The graphics are vividly presented
What do you like least about the instructional material?	➢ The models in the photos-It would be best to take personal photos of MAAP students demonstrating the skills ➢ the pictures because some are not very clear
What are your Comments and Suggestions	➢ I suggest that all photographs be made colorful. ➢ For the hand signals, some are repeated, and some may better use arrows or direction of movements (hand movements). ➢ Kindly check the alignment of the outcomes with the activities and the assessment tasks. Also, perhaps revisit the learning outcomes to see to it that they are specific and attainable for every lesson. ➢ The learning outcomes in the module were mixed and targeted more than one performance. However, in the activity and performance task, only one target is addressed. ➢ References may have complete details like the title/topic, dates, and the likes.

The summary of the responses clearly shows that the respondents agree that what they like about PE 4 module are the photos, illustrations and graphics but also suggested it be improved.

Comments and suggestions about the module include checking the alignment of the course outcomes and activities as well as improvements on how the references are written.

4. Conclusions and Recommendations

In light of the preceding results, the following conclusions are drawn:

1. PE 4 module is "Highly" appropriate or fit for the purpose; it is "Highly" relevant to the Discipline; it is "Highly" effective; it is "Highly" efficient and is "Highly" satisfiable.

2. The areas to be improved in the module are illustrations and photos, alignment of activities with the course outcomes, and formatting of references.

Following the results and conclusions, the following recommendations are enumerated:

1. Since PE 4 module is highly rated, instructions are recommended to be carried out thru modular.

2. Future research may be done on the level of students as to their acceptability and satisfaction with PE 4 module.

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Evaluation of the MAAP STS Module:
Basis for Improvement

Research Priority Area: **Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The study aimed to evaluate one of the modules used to deliver instructions at the Maritime Academy of Asia and the Pacific (MAAP). Specifically, the study evaluated the Science, Technology, and Society (STS) Module authored by Dr. Dela Cruz and Mrs. Alayon-Perdido. The evaluation utilized both qualitative and quantitative data. The evaluation focused on the Quality of the Content, Presentation, and Effectiveness. The respondents were 170 4cl BSMT midshipmen during the academic year 2020 – 2021. The results show that the overall numeric evaluation on the module falls within the range of 4.50 – 5.00, corresponding to "Strongly Agree" in all areas evaluated. The descriptive equivalent is "Very High." The respondents rated the STS module "Very High" in terms of the quality of the content, presentation, and potential effectiveness. The respondents commented that the module 'the module is fine and understandable.' On the other hand, suggestions for improvement include that 'the time allotment should be much longer so that the cadets will internalize and can elaborate more to a specific topic.'

KEYWORDS: *Content, Effectiveness*

1. Introduction

When COVID 19 escalated to a worldwide pandemic, health protocols in all sectors must be adapted and implemented to ensure the containment of the virus. The education sector is greatly affected by the pandemic which resulted in the shift from face-to-face classroom-based instructions to the online teaching-learning process.

Amidst the spread of the pandemic, The Maritime Academy of Asia and the Pacific (MAAP) proved itself to be responsive to adjust in the situation and worked very hard to design a scheme to continue its operation without sacrificing the quality of education. One of the first measures made by the institution was the preparation of modules in all courses. A module for the course NGEC 7, with the descriptive name of Science Technology and Society (STS), authored by Dr. Dela Cruz and Mrs. Perdido, was prepared in response to the needs of the present situation. The module is uploaded to the MAAP Learning Management System (LMS).

NGEC 7 with the descriptive name Science, Technology and Society (STS) is one of the core courses in the New General Education Curriculum (NGEC), in tertiary education.

STS is one of the eight general education courses. STS deals with the interactions between science, technology and social, cultural, political and economic contexts which shape and are shaped by them; specific examples throughout human history of scientific and technological developments. (CHED Memorandum Order No. 20 s. 2013)

The Maritime Academy of Asia and the Pacific (MAAP) has consistently improved instruction in all aspects. These improvements include the following: continuous professional development of its instructors; acquiring and upgrading state-of-the-art and world class simulators and equipment; and development of relevant teaching materials. Learning modules are one of the many teaching materials employed in the delivery of instruction.

Learning Module is a tool that provides course materials in a logical, sequential, order, and guides students through the content and assessments in the order specified by the instructor. Instructors can insert formatted text, files, weblinks, discussion topics, assignments, tests and quizzes, assessments and so on. (UF e-learning, 2013)

A learning module helps immerse students in the lesson or concept you are teaching. If you use a textbook or other materials as the basis for your course curriculum, modules are an effective and logical way to group content to match the pace of these materials. (Blackboard.com, 2017)

It is essential to evaluate any teaching materials. As an important teaching material, the learning module used in the delivery of instructions must also be evaluated.

Module evaluation refers to the formal and informal processes of collecting feedback from students on the relevance, effectiveness and efficiency of the module. Module evaluation should also be seen as an opportunity for individuals and teams to review the effectiveness of their approaches. (Queen Margaret University Module Evaluation Policy)

The usability and effectiveness of modules can be measured through evaluation. The best persons to evaluate the module are its users. None other than the students. According to the University of Worcester Module Evaluation Policy, The purpose of module evaluation is to enhance the student learning experience to make continuous improvements to levels of student satisfaction,

engagement, and student success. Obtaining student views on their learning experience through formal and informal mechanisms is central to module evaluation.

Module evaluation is a crucial component of Quality Enhancement and can serve several vital purposes: Allow continuous, iterative improvement of the module's content and teaching methods; Provide feedback to teachers on quality of teaching; Help teachers understand what approaches students find valuable; Alert teachers to problems and suggest ways to rectify them; Demonstrate to students that their opinions matter and concerns are acted upon; Provide evidence of good practice to managers, and, To support career advancement. (Birmingham City University Module Evaluation Guide 2019)

Urbano (2020) conducted a study entitled "Development and Evaluation of Modules on Earth and Space." The study is centered on developing a module that provides activities and lessons for students to learn and eventually improve their academic performance in Science. The module was evaluated by the teachers using a set questionnaire. Results of the evaluation include that the module allows learners to think logically and critically, all of which are relevant requirements for students to learn and eventually improve their academic performance.

Guido (2014) made a study entitled Evaluation of a Modular Teaching Approach in Materials Science and Engineering. A standardized faculty-student instructional module evaluation checklist that sought for the assessment for the learning objectives, evaluation of acceptability, effectiveness and the acquired skills in the module. The study shows that the instructional module in materials science and engineering is practical for students' knowledge adaptation and shows suitability to the level of the students and acceptability to the faculty evaluators.

This research is conducted to evaluate the module in STS by its first users, the 4cl BSMT midshipmen, during the Second Semester A. Y. 2020 – 2021.

The general problem of the study is: "How may the 4cl BSMT midshipmen evaluate the STS Module of the Maritime Academy of Asia and the Pacific during the Second Semester A. Y. 2020 – 2021?"

Specifically, it sought answers to the following specific questions:

1. How may the respondents evaluate the quality of the content of the STS module?
2. How may the design and presentation of the STS module be evaluated by the respondents?
3. How may the respondents evaluate the Potential Effectiveness of the STS module?
4. What are the comments and suggestions of the respondents on the STS module?

2. Methods

The study utilized the descriptive research design. Descriptive research, according to Jovancic (2020), is a research method used to describe the phenomenon that's being studied. The main focus of descriptive research is on the answers to "what" rather than the "why." In other terms, it only describes the research topic without explaining why it is like that. McCombes (2019) explained that descriptive research is an appropriate choice when the research aim is to identify characteristics, frequencies, trends, and categories.

The data was gathered through a survey method. Survey research, according to Check and Schutt (2012), is defined as the collection of information from a sample of individuals through their

responses to questions. Singleton and Straits (2009), on the other hand, emphasized that this type of research allows for a variety of methods to recruit participants, collect data, and utilize various methods of instrumentation. Survey research can use quantitative strategies such as questionnaires with numerically rated items, qualitative research strategies as in open-ended questions, or both strategies in mixed methods. Qualitative research is often used to describe and explore human behavior, survey methods are therefore frequently used in social and psychological research. (cited by Ponto, 2015)

The data were collected through an online survey questionnaire. The questionnaire consists of the items from the instrument in the study of Dela Cruz (2021). It was tailored to the current study since the instrument was initially used to evaluate the module in Physical Fitness 1. The reliability is measured through the Cronbach alpha coefficient. For the first part, Quality of the Content is 0.96; for, the second part Design, and Presentation, the calculated Cronbach alpha coefficient is 0.93; and for part 3, Potential Effectiveness, the calculated Cronbach alpha coefficient is 0.92. All are interpreted as having "Excellent" internal consistency.

The respondents in this research are the 4cl BSMT midshipmen during the Second Semester of academic year 2020 – 2021. The data were collected, tallied, and analyzed to interpret, draw findings, and consequently arrive at a conclusion.

3. Results

The result presented here follows the sequence of how the research problem is stated. Table 1 presents the frequency and means distribution of the responses in the evaluation questionnaire on the quality of content of the STS module.

Table 1. *Frequency and Mean Distribution of Respondents' Evaluation of STS Module in terms of Quality of the Content.*

Quality of Content	5	4	3	2	1	Mean	Descriptive Equivalent
1. The contents of the STS module match the learning outcomes of the course.	103	63	4	0	0	4.58	Strongly Agree
2. The topics are aligned with the scope stated in the module.	94	74	2	0	0	4.54	Strongly Agree
3. The activities/exercises are focused and specific to the scope stated in the module.	102	63	5	0	0	4.57	Strongly Agree
4. The contents of the module are correct and accurate.	105	61	4	0	0	4.59	Strongly Agree
5. The contents of the module are valid and relevant.	111	57	2	0	0	4.64	Strongly Agree
6. The contents of the module are current and timely.	98	67	4	1	0	4.54	Strongly Agree
7. The lessons are sufficient, adequate to cover the topics stated in the module.	92	70	8	0	0	4.49	Agree
8. The time allotted for each topic is appropriate.	86	74	8	2	0	4.44	Agree
9. The module presents opportunities for task-based learning.	96	67	6	0	0	4.51	Strongly Agree
10. The activities and exercises in the module are suitable for self-directed learning.	94	71	5	0	0	4.52	Strongly Agree
				Overall Mean		4.54	Very High

Scale: 1.00 – 1.49 = Strongly Disagree (Very Low); 1.50 – 2.49 = Disagree (Low); 2.50 – 3.49 = Tends to Agree (Moderate); 3.50 – 4.49 = Agree (High); 4.50 – 5.00 Strongly Agree (Very High)

Table 1 shows that the highest mean rating of the respondents in the quality of the STS module is 4.64. It means that the respondents "strongly agree" that the content of the module is valid and

relevant. All other items except items 7 and 8 have mean ratings that fall within the range of 4.50 – 5.00, which means that the overall response is "Strongly Agree" with the equivalent of "Very High" ratings. Consequently, the respondents "Strongly Agree" on nine out of 10 items.

The lowest mean rating given by the respondents is 4.44 for item, 8 and 4.49 for item 7. It means that the respondents "Agree" that the time allotted for each topic is appropriate. Similarly, the respondents "Agree" that the lessons are sufficient, adequate to cover the topics stated in the module.

The overall mean is 4.54, interpreted as "Very High." The results indicate that according to the respondents the STS Module has a "Very High" Quality of Content.

Table 2 presents the frequency and mean distribution of the responses in the evaluation questionnaire of the STS module in its presentation.

Table 2. *Frequency and Mean Distribution of Respondents' Evaluation of STS Module in terms of Presentation*

Presentation	5	4	3	2	1	Mean	Descriptive Equivalent
1. The font size and type used in the module were appropriate.	85	78	7	0	0	4.46	Agree
2. The sizes of the pictures and illustrations in the module are appropriate.	91	69	9	1	0	4.47	Agree
3. The figures, diagrams and illustrations made the module appealing and exciting.	95	72	3	0	0	4.54	Strongly Agree
4. The topics in the module are well organized.	96	73	1	0	0	4.56	Strongly Agree
5. The instructions and requirements in the module are easily understood.	96	66	7	0	1	4.51	Strongly Agree
			Overall Mean			4.51	Very High

Table 2 shows that two items out of 5, items 1 and 2, fall within the range of 3.50 – 4.49 with an overall response of "Agree." Consequently, the respondents "Agree" that the font size and type used in the module were appropriate and also "Agree" that the sizes of the pictures and illustrations in the module were appropriate

Three items have mean numeric ratings that fall within the range of 4.49 – 4.00 with an overall response of "Strongly Agree." The item with the highest numeric rating is number 4. Thus, the respondents "Strongly Agree" that the topics in the module are well organized, along with items 3 and 5.

The overall mean is 4.51, interpreted as "Very High." The results indicate that the respondents gave a "Very High" numeric rating on the STS module in terms of its presentation.

Table 3 presents the frequency and mean distribution of the responses in the evaluation questionnaire on the potential effectiveness of the STS module.

Table 3 shows that all the items in the questionnaire about the potential effectiveness of the STS module got mean numeric ratings that fall within the range of 4.50 – 5.00. Respondents generally responded "Strongly Agree" in all the items. The highest mean is 4.55, both for items 4 and 5. Consequently, the respondents "Strongly Agree" that the module is written at a level suitable for student's understanding and "Strongly Agree" that the language used in the module is appropriate for the student's level of understanding, along with all other items.

Table 3. *Frequency and Mean Distribution of Respondents' Evaluation of STS Module in terms of Potential Effectiveness*

Potential Effectiveness	5	4	3	2	1	Mean	Descriptive Equivalent
1. The figures, diagrams and illustrations encourage the students to read and study the module.	94	71	5	0	0	4.52	Strongly Agree
2. The module allows the students to think independently.	94	68	8	0	0	4.51	Strongly Agree
3. The module allows the students to learn at their level of ability.	91	76	3	0	0	4.52	Strongly Agree
4. The module is written at a level suitable for student's understanding.	95	73	2	0	0	4.55	Strongly Agree
5. The language used in the module is appropriate for the students' level of understanding.	97	70	3	0	0	4.55	Strongly Agree
			Overall Mean			4.53	Very High

The overall mean is 4.53, interpreted as "Very High." The results indicate that the respondents gave a "Very High" numeric rate on the potential effectiveness of the STS module.

The results parallel the finding of Urbano (2020) that the module provides the learners to think logically and critically. Likewise with the findings of Guido (2014) that the module is practical for students' knowledge adaptation and shows suitability to the level of the students and acceptability to the faculty evaluators.

The respondents wrote comments and suggestions as the last part of the questionnaire. Several respondents wrote the following comments, among others: 'everything is good,' 'The module is fine and understandable,' 'Personally, the module has helped me understand the lessons and topics,' 'Generally, the module is of great relevance and significance to students' learning,' 'I am satisfied to the content of a module,' 'For me, I think the module is good enough to,' and 'The module was already appropriate,' 'The module is accurate and efficient for us, especially in the modern world or new generation, we will be able to find out or learn things about what is happening in the world (science and technology).'

Some respondents wrote suggestions. These are: 'I strongly suggest that the module should include more concrete and concise examples for better understanding of the entire course,' 'figures and diagrams and pictures sometimes smaller,' 'give some topics more time to be discussed,' 'the time allotment should be much longer so that the cadets will internalize and can elaborate more to a specific topic, and 'the module should be updated and discuss the newest inventions today.'

The last suggestion indicates that a respondent did not understand the description of STS. Part of the course includes specific examples throughout human history of scientific and technological developments.

5. Conclusions and Recommendations

Based on the results of the study, the following conclusions are drawn:

1. The quality of the content of the STS module is rated "Very High."
2. The respondents rated how the STS module is presented as "Very High."
3. The potential effectiveness of the STS module is "Very High."

The researchers recommend the following:

1. Continue to use the STS module since a majority of the respondents commented that the module helps understand the course.
2. Look into the comments and suggestions of the respondents and use them to improve the module.

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Course Quality Evaluation and Students' Performance in General Physics D

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

General Physics D is an add-on course intended for maritime students as part of the general education supporting maritime profession. The course is designed to serve as one of the general education courses to serve as foundation leading to the degree program of Bachelor of Science in Marine Transportation (BSMT). The study aimed to have students evaluate the course General physics D in three aspects: Course structure, Teaching Materials, and Instructors. The results of the students' evaluation of the course were correlated to their performance in the said course. The respondents were 218 4CL (first year) midshipmen taking up General physics D in the 2nd semester of A.Y. 2021-2022. Results show that the General Physics D is 'Good' in terms of its course structure, teaching materials, and instructors. Results of the study showed that there is a very weak, positive correlation between the Course Structure of General Physics D but Instructional Materials and Instructors exert no significant relationship to the Academic Performance. The study recommends that future research may be conducted to evaluate other aspects or variables of General Physics D.

KEYWORDS: *Evaluate, Physics, Course Structure, Teaching Materials, Instructor, performance*

1. Introduction

According to britannica.com Physics is a science that deals with the structure of matter and the interactions between the fundamental constituents of the observable universe. Kerr (n.d.) explained that physics is concerned with the laws of nature and the properties of different types of matter.

Engineering physics is a great preparation for almost any career. They teach students how to analyze complex problems and give strong quantitative background that can be applied in any technical field. (Stanford University)

Educational reform in the country led to its shift from a 10-year basic education to K to 12. Basic education in the Philippines before K to 12 consists of 6 years of elementary education and 4 years of high school education. The K to 12 program in the Philippines was introduced in 2013. It was in 2013 when RA 10533 became law. This law is known as the "Enhanced Basic Education Act of 2013". The K to 12 Program covers Kindergarten and 12 years of basic education (six years of primary education, four years of Junior High School, and two years of Senior High School (SHS) to provide sufficient time for mastery of concepts and skills, develop lifelong learners, and prepare graduates for tertiary education, middle-level skills development, employment, and entrepreneurship. (Berto, 2019; and Estacio, 2015)

When K to 12 took effect, the Commission on Higher Education revised the curriculum so as not to duplicate subjects in Grades 11 and 12. The nine General Education (GE) core subjects are: Understanding the Self, the Contemporary World, Purposive Communication, Art Appreciation, Ethics, Readings in Philippine History, Mathematics in the Modern World, Science and Technology, and Society, and the mandatory subject on the life and works of national hero Jose Rizal. (Pazzibugan, 2013)

Notice that in the nine GE core subjects, Physics is not included. Physics courses previously taken up in the tertiary level are being given to grades 11 and 12 as part of the K to 12 Program. However, it has been observed that the subject Physics is necessary to be included as one of the courses at the tertiary level.

Many tertiary institutions, like the Maritime Academy of Asia and the Pacific (MAAP), started to include General Physics as one of the courses in both BSMT and BSMarE programs in the academic year 2021-2022. The current study aimed to evaluate the teaching quality of General Physics provided to the 4CL (First Year) BSMT students. The course is called General Physics D or General Physics for Deck Students.

Course evaluations are intended to obtain student feedback regarding courses and teaching for improvement purposes and to provide a defined and practical process to ensure that actions are taken to improve methods and teaching. (Denson, Loveday and Dalton, 2009)

A course evaluation is a short survey conducted by an educator at the end of a class or course of study. Evaluation form aims to collect general information on what each student liked and disliked most about the class to improve the educational experience for future students. (Top Hat, n.d.)

Centoni and Maruotti (2021) made a study entitled Students' evaluation of academic courses: An exploratory analysis of an Italian case study. It aimed to contribute to the existing literature on course and teaching evaluation by providing an empirical research based on questionnaires collected by an Italian private institution, namely the Libera Università Maria Ss. Assunta (LUMSA), for several degrees in Social Sciences. Findings of the study reveal that student satisfaction relates to teaching

and course organization. Evidence showed that students typically evaluate their course based on their experience rather than their interests.

The study focused on students' evaluation of the course General Physics D in terms of course structure, materials, and instructor. CMU (n.d.) posts that the course structure refers to the choice of topics and the organization and sequencing of course content. The selection of subjects and their organization should always support the learning objectives for the course. UW (2021), on the other hand, defined instructional materials as the content or information conveyed within a course. Instructional materials include the lectures, readings, textbooks, multimedia components, and other resources in a course. Instructional materials are used in both face-to-face and online classrooms; however, some must be modified or redesigned to be effective for the online environment. Best instructional materials are aligned with all other elements in the course, including the learning objectives, assessments, and activities.

Aside from the course structure and instructional materials, the instructors handling General Physics D were also evaluated. Formplus (2022) explains that teacher evaluation is a well-defined and systematic process that is used to assess a teacher's performance in the classroom. The instructor's pedagogical behaviors are assessed using a set of standardized criteria.

The primary purpose of teacher evaluations is to enhance teachers' pedagogical skills and consequently improve student achievement. The principal objective of teacher evaluations is that they are positively linked to student learning. Several factors such as education or experience, mastery of instructional techniques, collaboration with colleagues, and participation in professional development are all considered in the modern understanding of teacher quality. Teacher evaluations also serve the purpose of accountability. It may contribute to building trust among colleagues and administrators, preparing programs, and professional development. (James, 2021)

Ching (2018) made a literature review on the student evaluation of teaching. The study was an examination of the search, experience, and credence qualities of SET. One relevant finding shows the influence of students' prior expectations on SET ratings. Therefore, teachers are advised to establish a psychological contract with the students at the start of the semester.

According to BALLOTPEDIA (n.d.) academic performance is the measurement of student achievement across various academic subjects. Education officials typically measure achievement using classroom performance, graduation rates, and results from standardized tests. The current study measured the academic performance in General Physics D of the 4CL students in terms of their final grades. Academic performance in terms of the final grade is correlated to the quality of the course.

Brew, Nketiah, and Koranteng (2021) conducted a literature review on the academic performance of students in Senior High Schools and various factors affecting students' performance. The research elucidated how these factors negatively affect academic performance and the need for them to be minimized to improve students' academic performance. Results show that other factors such as students' parental levels of education and income, textbooks availability and accessibility, libraries, practical laboratory, meals provision and teachers have tremendous effects on academic performance of students at school. Those who are above average academically and are positively exposed to these factors are likely to perform better than those who are less exposed to these factors.

Sanchez, Castejon, and Leon (2020) conducted a study entitled Students' Evaluation of Teaching and Their Academic Achievement in a Higher Education Institution of Ecuador. The research looked into the relationship between student evaluation of teaching (SET) and academic achievement in higher education. Those Meta-analytic studies on teaching effectiveness show a wide range of results,

ranging from small to medium correlations between SET and student achievement, based on diverse methodological approaches, sample size studies, and contexts. Results of the individual and group-class analysis revealed that SET was moderately low but related to academic achievement significantly once the effect of previous academic achievement is controlled.

Blazar (2016) wrote his dissertation entitled "Teacher and Teaching Effects on Academic Performance, Attitude, and behaviors." The study finds, among others, that student outcomes are predicted by teaching practices. The research confirms that teachers have a substantial impact on their students' academic and lifelong success.

In line with the variables presented, the general problem of the study is: "How may the course quality of General physics D be related to the students' performance?"

Specifically, it sought answers to the following questions:

1. How may the students evaluate the course quality of General Physics D terms of Course structure, Teaching Materials, and Instructors?
2. What is the respondents' performance in General Physics D in terms of their final grades?
3. Do the respondents perform 'satisfactory' in General Physics D based on their final grades?
4. Is there a significant relationship between the students' performance and education quality of the course General Physics D?

In line with the stated problems of the study, the hypotheses tested in the study are as follows: (1) The respondents do not perform 'satisfactory' in General Physics D based on their final grades. (2) There is no significant relationship between the course quality of General Physics D and students' performance.

2. Methods

The study utilized the descriptive-correlational research design. Those variables involved in the study are the course quality of General Physics D and the students' performance in the said course.

A correlational research design investigates relationships between variables without the researcher controlling or manipulating them. Correlation reflects the strength and, or direction of the relationship between two or more variables. The correlation can be either positive or negative. Bhandari (2022)

Following the variables presented and in line with the research design, the study utilized the IV-DV model, as shown in the paradigm, of the study in figure 1.

The independent variable pertains to evaluating the course quality of General Physics D in terms of course structure, instructional materials, and instructors. On the other hand, the dependent variable is the students' performance in the course mentioned above regarding the final grades. The two variables were correlated.

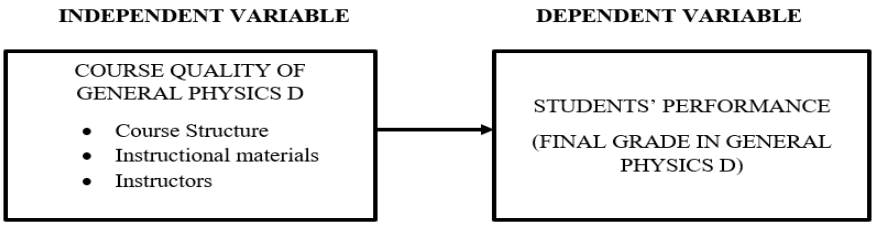

Figure 1. Paradigm of the Study

The data are obtained through a survey method. McCombes (2022) explained that survey research means collecting information about a group of people by asking them questions and analyzing the results.

The instrument used in the study is a researchers'-made questionnaire based on the elements of course delivery. The first part consisted of 14 items to evaluate the course General Physics D terms of the course structure. The second part consisted of 5 items intended to assess the teaching quality of General Physics D in terms of the teaching materials used in the course delivery. The last part of the questionnaire consisted of 10 items that measured the teaching quality of General Physics D in terms of the instructors handling the course.

The questionnaire was pilot tested to 15 selected midshipmen not included in the study. The reliability was calculated using the Siegle-Reliability-Calculator. The calculated Cronbach alpha for the evaluation of course structure is 0.92, interpreted as having 'excellent' internal consistency. Meanwhile, the calculated Cronbach alpha for the assessment of instructional materials is 0.96, interpreted as having 'excellent' internal consistency. Finally, the calculated Cronbach alpha for the assessment of instructors is 0.95, interpreted as having 'excellent' internal consistency.

The responses to the questionnaire were assigned with corresponding numerical values: 1 is not at all true, 2 slightly true, 3 somewhat true, 4 almost completely true, and 5 completely true.

To interpret the obtained means, the following scale and descriptions were used:

Scale	**Descriptive Equivalent**
1.00 – 1.49	Very Poor
1.50 – 2.49	Poor
1.50 – 3.49	Fair
3.50 – 4.49	Good
4.50 – 5.00	Very Good

The items in the questionnaire were encoded in the google form. The link is sent to the 4CL midshipmen taking up the General Physics D. The data are retrieved together with the final grades of the students from the final grade report. Data were tabulated and analyzed using Microsoft Excel and IBM SPSS.

3. Results

This section presents the results following the sequence as to the research problems are stated.

Table 1 shows the evaluation of General Physics D in terms of Course Structure. Table 1 shows that the first two items garnered the highest means that fall within the range of 4.50 – 5.00, interpreted as "very good." The results indicate that General Physics D is 'very good' in challenging

Table 1. *Course Quality of General Physics D in terms of Course Structure*

Items	Mean	SD	Descriptive Equivalent
1. I found the course General Physics D intellectually challenging and stimulating	4.52	0.69	Very Good
2. This course made me think.	4.55	0.71	Very Good
3. The course was organized in a manner that helped me understand underlying concepts.	4.19	0.81	Good
4. This course helped me develop intellectual and critical thinking skills.	4.26	0.83	Good
5. I was able to apply what I learned to a variety of problems or examples.	4.10	0.84	Good
6. I was able to relate what I learned in this course, General Physics D, to experiences and ideas outside in other fields	3.98	0.96	Good
7. The readings were appropriate to the course outcomes of the course.	4.31	0.76	Good
8. The course workload and requirements were appropriate.	4.12	0.95	Good
9. Exams and assignments were reflective of the course content.	4.34	0.76	Good
10. The examinations/projects measured my knowledge of the course material.	4.33	0.84	Good
11. Student learning was fairly assessed (e.g., through quizzes, exams, projects, and other graded work).	4.30	0.85	Good
12. Exams/assignments were a fair assessment of my knowledge of the course material.	4.28	0.83	Good
13. The grading practices are clearly defined.	4.30	0.87	Good
14. The grading practices were fair.	4.41	0.82	Good
Overall	4.29	0.82	Good

Scale: 1.00 – 1.49=Very Poor; 1.50 – 2.49=Poor; 2.40 – 3.49=Fair; 3.50 – 4.49=Good; 4.50 – 5.00=Very Good

and stimulating the students intellectually and making them think. The corresponding standard deviations (SD) were among the lowest, indicating that the responses of the students were less dispersed compared to the other items. The remaining 12 items have means that fall within the range of 3.50 – 4.49, interpreted as "Good." Item 6 had the lowest mean of 3.98. The item, in particular, looked into whether the learnings in the course can relate to experiences and ideas in other fields. The course structure of General Physics D is 'good' in matters about the readings, workloads, assessments, and grading practices.

The overall mean of 4.29 (SD = 0.82) indicates that the Course Structure of General Physics D is 'Good.'

The teaching materials included in the evaluation of General Physics D are those pertaining to the ppt used in the delivery of the course, as well as the module, exercises, assignments, and worksheets that contain activities and problem sets. Table number 2 presents the evaluation of General Physics D in terms of the Teaching Materials used in the course delivery.

Table 2. *Measures of the Course Quality of General Physics D in terms of Teaching Materials*

Items	Mean	SD	Descriptive Equivalent
1. I learned and understood the subject materials in this course.	4.11	0.89	Good
2. The course presentations (e.g., ppt) are well prepared.	4.32	0.87	Good
3. The instructional materials (i.e., modules, worksheets, etc.) increased my knowledge and skills in the subject matter.	4.21	0.95	Good
4. Graded assignments helped me understand the course material.	4.26	0.84	Good
5. The course exercises (i.e., problem set, etc.) facilitated my learning.	4.26	0.77	Good
Overall	4.23	0.86	Good

The results show that all the five items have means that fall within the range of 3.50 – 4.49, interpreted as "Good." The SD values are relatively high, indicating wide dispersions or differences in the responses. The overall mean of 4.23 (SD = 0.86) suggests that the teaching materials used in the delivery of General Physics D are evaluated as 'Good."

Instructors are in charge of the actual delivery of instruction. Hence, a complete course evaluation must include the evaluation of instructors. Table 3 presents the evaluation of the instructors assigned to teach General Physics D.

Table 3. *Course Quality of General Physics D in terms of Instructors*

Items	Mean	SD	Descriptive Equivalent
1. The instructor handling General Physics D is enthusiastic about teaching the course.	4.39	0.86	Good
2. The instructor was well prepared for class.	4.55	0.69	Very Good
3. The instructor used class time effectively.	4.55	0.73	Very Good
4. The instructor communicated clearly and was easy to understand.	4.27	0.86	Good
5. The instructor encouraged student participation in class.	4.51	0.74	Very Good
6. The instructor presented the course material in a straightforward manner that facilitated understanding.	4.41	0.78	Good
7. The instructor effectively organized and facilitated well-run learning activities.	4.37	0.85	Good
8. The instructor's teaching methods were effective in aiding my learning.	4.24	0.88	Good
9. The instructor stimulated my interest in the subject matter.	4.16	0.88	Good
10. The instructor provided helpful feedback on my performance on tests, papers, etc.	4.36	0.80	Good
Overall	4.38	0.81	Good

Table 3 shows three items having means that fall within the range of 4.50 – 5.00. The calculated values of SD for these items are relatively lower as compared to other items indicating lesser dispersion or differences in the responses. Items 2 and 3 both garnered the highest mean of 4.55, while item 5 had the mean of 4.51. Those means are interpreted as "Very Good." Consequently, the results indicate that the instructors handling General Physics D are 'very good' as they are well prepared, use class time effectively, and encourage the students to participate in the class.

The overall mean is 4.23 (SD=0.86) interpreted as "Good." Therefore, the instructors are 'good' in handling General Physics D.

The performance of the students in the course General Physics D is measured in terms of their final grades expressed in the 5-point grading system (1.00 as the highest and 5.00 as the lowest). Table 4 presents the descriptive statistics of the final grades of the 4CL midshipmen in General Physics D.

Table 4. *Performance in General Physics D in terms of Final Grade*

N	Mean	Median	Mode	Lowest	Highest	Q1	Q3	SD
218	2.08	2.10	2.10	2.70	1.50	1.90	2.20	0.25

Table 4 shows that the mean final grade in General Physics D of the 218 students is 2.08. Fifty percent or 109 students, have final grades equal to or above 2.10. The most occurring grade is also 2.10. The lowest grade attained is 1.50 as against the lowest, which is 2.70. Twenty-five percent or 55 of the students have final grades equal to or higher than 1.90, as indicated by quartile 1 (Q1). In the same manner, twenty-five percent or 55 out of 218 of the respondents have final grades equal to or lower than 2.20 (as shown by Q3). The standard deviation (SD) of 0.25 is relatively small, indicating that the final grades are not quite dispersed.

MAAP employs an exemption policy. One of the requirements for a student to be exempted in the course is they must have a 'Satisfactory' GPA or grade not lower than 72% or 2.1. To test whether the final grade of the students is 'satisfactory,' a normality test is run in the data using the IBM SPSS. The Sig. value (p-value) of the Shapiro-Wilk test turns out to be .006, which is less than 0.05, indicating that the data deviate from a normal distribution. Hence, a non-parametric one-sample Wilcoxon signed test is used through the IBM SPSS. The summary of the One-sample Wilcoxon Signed Test on Final Grades is shown in table 5.

Table 5. *One-sample Wilcoxon Signed Test on Final Grades*

Standard	Median	Sig. (p-value)	Interpretation
GPA = 2.10 (Satisfactory)	2.10	.196	Not Significant

Table 5 shows that the p-value of the test is .196, which is greater than the significance level alpha = .05. Hence, the null hypothesis cannot be rejected. Therefore, the final grades of the students are not significantly different from 'Satisfactory' or 2.10.

To test if there is a significant relationship between the Course Quality of General Physics D and the performance of the students in terms of the final grades, a Spearman Rank Correlation is run in the data through the IBM SPSS. The summary of the results is shown in table 5.

Table 5. *Spearman's rho between the Course Quality and Students' Performance in General Physics D*

Course Quality of General Physics D	Students' Final Grades
Course Structure	rs = .154, p = .044*
Instructional Materials	rs = .133, p = .082
Instructors	rs = .132, p = .084

*p<.05

Table 5 shows that one p-value is significant at .05. Thus, the null hypothesis is rejected. Results show a very weak, positive correlation between the Course Quality of General Physics D in terms of Course Structure and student's performance in the course in terms of the final grades.

4. Discussions

The results show that the respondents evaluated the General Physics D as 'Good' in three aspects included in the study. These aspects are the Course Structure, Teaching Materials, and the instructors handling the course. Refinement may be done in those aspects mentioned to improve the course from 'Good' to 'Very Good.'

The academic performance of the respondents is measured in terms of the Five-point grading system (1.00 as the highest and 5.00 as the lowest). Final grades of the students are generally not significantly different from 2.10. Students' performance in General Physics D is rated as 'Satisfactory.'

Correlational analysis between the Evaluation Course Quality and Performance of the students proved that there is a very weak, positive correlation between the Course Structure of General Physics D.

Evaluation of Instructional Materials and Instructors exert no significant relationship to the Academic Performance. Results do not agree with the findings of Blazar (2016) that the research confirms that teachers have substantial impacts on their students' academic and lifelong success; Brew, Nketiah, and Koranteng (2021) that teachers have tremendous effects on the academic performance of students at school.

5. Conclusions and Recommendations

Based on the results of the study, the following conclusions are drawn:

1. The General Physics D is 'Good' regarding its course structure, teaching materials, and instructors.
2. The 4CL Midshipmen performed 'Satisfactory' in General Physics D.
3. There is a very weak, positive correlation between the Course Structure of General Physics D.
4. Instructional Materials and Instructors exert no significant relationship to Academic Performance.

In the light of the results and conclusions enumerated, the following recommendations are formed:

1. Examine the indicators for course quality evaluation that garnered mean ratings below "Very Good" to use in the refinement of the course.
2. Teaching materials can enhance the delivery of General Physics D to exert positive relation to contribute to the performance of the students.
3. Future research may be conducted to evaluate other aspects of General Physics D. Other variables may also be looked into to evaluate further and assess the course.

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Assessment on the Usage of Basic Electricity Workbook Amidst New Normal Online Teaching

Research Priority Area: **Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The study is a quantitative research that focuses on the overall evaluation of the Basic Electricity Workbook. In addition, the paper aimed to evaluate the usage of the workbook that may address necessary revisions of the learning material on modular learning amidst the new normal. Convenient sampling was used to gather responses that involved Bachelor of Science Marine Engineering (BSMarE) students. The academic year covers 2020-2021. Data for the present paper were collected from the respondents through survey questionnaire using online platform. Findings showed that course planning and organization, particularly the appropriateness, clarity of learning objectives and involvement of students in-class activities, are essential factors to consider in designing a learning material. It is notably important, especially in an online class, mainly using Google Classroom. Indeed, with the overall usage of the Basic Electricity Workbook was remarked as "good." The necessary revisions will be made based on the given feedback of the users, which may be on the subsequent conduct of the course.
Similarly, it is also significant to consider the learner's background, interest, and needs accompanied by course monitoring, which may improve the workbook material. With proper and appropriate teaching pedagogy, the overall efficacy of teaching-learning process through usage of a specific learning material like the workbook.

KEYWORDS: *Online Class, Learning Material, New Normal*

1. Introduction

Background of the Study. The fast-paced, changing world affected by the coronavirus pandemic has challenged the Philippine educational system. However, with the new standard scheme of the teaching-learning process, schools and teachers find possible ways to have learning continuity.

Maritime Academy of Asia and the Pacific, as one of the higher educational institutions (HEIs), has also struggled to seek alternatives to face-to-face class interaction. One of these alternatives that the Academy has initiated is constructing and developing different courses through workbooks and modules. Moreso, teachers are challenged to create relevant, research-based, and responsive instructional materials.

One of which is the designing, construction and development of the Workbook for Basic Electricity. The suggested steps or procedures of materials development include designing, implementing, and evaluating teaching materials. Dick and Carey (1990) suggest ten components of the systems approach model, that is, identify an instructional goal, conduct an instructional analysis, identify entry behaviors and characteristics, write performance objectives, develop criterion-referenced test items, develop an instructional strategy, develop and select instructional materials, design and conduct the formative evaluation, revise instruction, and conduct a summative assessment. Each of these components is closely related to each other in the systems approach model.

The present study provides the overall content of the Basic Electricity Workbook patterned to the idea of instructional design as proposed by Dick and Carey (1990).

Statement of the Problem. The general problem of the study is Assessment on the Usage of Basic Electricity Workbook Amidst New Normal Online Teaching.

Specifically, this study seeks to answer the following questions:

1. How may the module's content be described in terms of organization and planning; clarity of learning objectives; appropriateness of course workload; and student's participation?
2. What exercise/s from the workbook do cadets consider most applicable and least applicable?
3. What is the overall evaluation of MAAP Engine cadets on the Basic Electricity workbook?

The study assessed the overall content of the Basic Electricity workbook and proposed and implemented necessary revisions to develop the learning materials.

Literature Review and Framework. Learning materials like workbooks must require and facilitate learner self-exploration. Therefore, materials should let the learners be interested in drawing their attention and attracting learning the materials. This strategy will enable them to understand the materials by themselves.

The following are some of the related readings that support the claim of the present study.

Learning and teaching materials, in practice, can be developed/produced by evaluating learning materials, adapting, supplementing and creating own materials (Pinter, 2006). This material addresses the necessary construction and development of specific materials like the Basic Electricity Workbook, including possible revisions.

Moreover, Tomlinson (1998) commented that the impact of instructional materials was achieved when materials have a noticeable effect on learners when the learners' curiosity, interest, and attention are attracted.

Thus, with proper connection and establishment of the learning materials, it may serve its very purpose. Windschitl (2009) clarified that coherence with existing knowledge does not mean tailoring instruction to what teachers already know but rather taking into account their deeply engrained theories about "good" teaching and learning.

Yale University, Poorvu Center for Teaching and Learning (2021) states that well-organized courses encourage student motivation, performance, and persistence. Instructors who can design courses in many rich ways may help cultivate student's motivation and enhance opportunities for more effective learning.

Therefore, proper planning and organization of learning material will identify the effectiveness of the teaching and learning process in using such medium.

Meanwhile, clear learning objectives indicate that the teacher effectively focuses students' attention toward the learning objectives and the purpose of the lesson. Students in the classroom appear aware of the point of the classes or how they should be focusing their attention during activities (Gates, 2017). Clarity of learning objectives serves as a guideline or foundation of effective learning.

On the other hand, Burge (2019) emphasizes that by making sure that a module (or a learning material like a workbook) is constructively aligned, the learner may actively construct their understanding as long as all teaching and assessment is aligned with the intended outcomes. Thus, the appropriateness of workbook content must be considered in place of the required course hour.

Significance of the Study. The study is deemed significantly to students, instructors and management. MAAP Cadets may cater to the learning process to be more conducive to learners while simultaneously offering the expected course content. MAAP Faculty members, the findings from the present study may bring guidelines for future education-related- research endeavors of the department. Consequently, it will benefit the teaching process of the faculty members. Department of Academics, the study may provide a more specific scheme in terms of teaching practices. The present study results may be the basis for the further development of some other courses on both maritime and non-maritime programs.

Conceptual Framework. Figure 1 presents the analysis of designing and constructing the Basic Electricity Workbook (input). Through the actual assessment of the student's feedback(process) on its first usage during the new normal scheme, necessary revisions and development (outputs) are thereby expected.

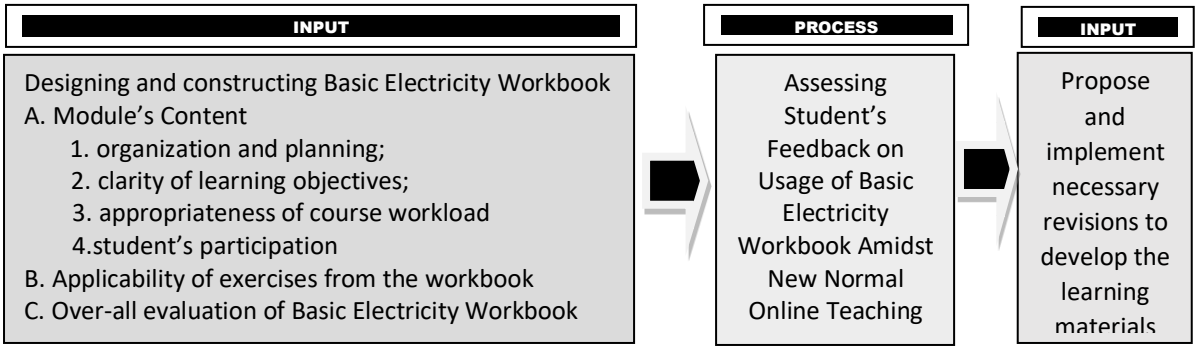

Figure 1: IPO Model

2. Methodology

Description of Participants involved. From January 7 to May 14, 2021, eleven different sections from the Regular Class of Batch 2024 under the BSMarE program took up the Basic Electricity course. This course is one of the allied subjects for the said program and was offered during the second term period. The 126 cadets answered the survey out of the 205 total population of Class 2024.

In four months, during the said term, instructors and cadets have utilized the Basic Electricity Workbook with the aid of the Google Classroom Application as an online environment.

Research Instrument. The tool for gathering data was a survey questionnaire through Google Form. Emails were sent to fourth-class BSMarE cadets. The survey questionnaire on evaluating the Basic Electricity Workbook used descriptive responses such as Good, Fair and Poor, and Strongly Agree, Agree, etc.

Data Collection and Analysis. The responses were gathered from Google Form using Convenience sampling. Finally, the answers were summarized using descriptive statistics, i.e., frequencies and percentages.

3. Results

This section reports the results of the evaluation of the workbook in Basic Electricity.

Table 1.1 *Course Content Organization and Planning*

Scale	Percent (%)
Strongly Agree	55.60
Agree	39.70
Neutral	4.70
Disagree	0.00
Strongly Disagree	0.00
Total	100

Table 1.1 conveys that the workbook's content was well organized and well planned because almost 95.30% of the respondents perceived it that way. In addition, there is a high percentage of those who strongly agree and agree.

Yale University supports this finding, Poorvu Center for Teaching and Learning (2021), that well-organized courses encourage student motivation, performance, and persistence. Instructors who can design courses in many rich ways may help cultivate student's motivation and enhance opportunities for more effective learning.

Therefore, proper planning and organization of learning material will identify the effectiveness of the teaching and learning process in using such medium.

Table 1.2. shows that 92.10% of the cadets agreed that the course's learning objectives were manifested clearly in the workbook activities.

Table 1.2. *Clarity of Learning Objectives*

Scale	Percent (%)
Strongly Agree	51.60
Agree	40.50
Neutral	7.90
Disagree	0.00
Strongly Disagree	0.00
Total	100

The presence of clear learning objectives indicates that the instructor effectively focuses students' attention toward the learning objectives and the purpose of the lesson. Thus, students in the classroom appear aware of the point of the tasks or how they should be focusing their attention during activities (Gates, 2017).

The presence of clear learning objectives indicates that the instructor effectively focuses students' attention toward the learning objectives and the purpose of the lesson. Thus, students in the classroom appear aware of the point of the tasks or how they should be focusing their attention during activities (Gates, 2017).

Clarity of learning objectives serves as a guideline or foundation of effective learning.

Table 1.3. *Appropriateness of Course Workload*

Scale	Percent (%)
Strongly Agree	48.40
Agree	45.20
Neutral	5.60
Disagree	0.80
Strongly Disagree	0.00
Total	100

It can be seen in Table 1.3 that 93.6% of the respondents agreed that the course workload included in the Basic Electricity workbook was appropriate to the number of hours given to the course per meeting.

Burge (2019) emphasizes that by making sure that a module (or a learning material like a workbook) is constructively aligned, the learner may actively construct their understanding as long as all teaching and assessment is aligned with the intended outcomes.

Thus, the appropriateness of workbook content must be considered instead of the required course hour.

Table 1.4 reflects that 93.60% of the cadets agreed, conveying that Electro1 Workbook's content allowed them to participate fully in the workbook activities.

Table 1.4. *Student's Participation as per Workbook's Content*

Scale	Percent (%)
Strongly Agree	49.20
Agree	44.40
Neutral	5.60
Disagree	0.80
Strongly Disagree	0.00
Total	100

This result is related to Donggil Song et al. (2019) study, which revealed that the effects of interaction on online learners' performance might depend on the content of interactions.

The content interaction may also depend on the course content, which may be of the interest of the learners and stimulate their motivation to engage in learning.

Table 2 shows the applicability of the exercises.

Table 2.1. *Top 3 Most Applicable Exercises*

Topics	Percent (%)
1.1 Electrical Diagrams and Symbols	55.60
2.5. Safety	49.20
4.1. Troubleshooting	48.40

Table 2.1. depicts that Topic 1.1: Electrical Diagram and Symbols used as techniques in Electric Circuits was considered by 55.60% of the cadets to be the most appropriate or applicable for them to learn as a foundation on their future jobs.

It is consistent with the findings of Leigh (2017) that considers electrical diagrams vital for any factory for the same reason that makes them mandatory for aircraft or nuclear plant operators: personnel safety.

Indeed, in the same note, the maritime industry, specifically vessels, also needs officers and crew equipped with electrical diagram and symbols.

Table 2.2. Top 3 Least Applicable Exercises/Activities

Topics	Percent (%)
1.5 Kirchhoff's Law Problem Solving	28.6
1.3 Resistor Color Coding	27.8
1.8 Single Phase AC Circuit Problem Solving	25.4

Table 2.2 only shows that 28.6% of the respondents were not into problem-solving. Thus, the respondent considered problem-solving to be the least applicable in their endeavor.

This finding is the same notion as presented in the news article by Manila Bulletin (2012) that Math is typically considered the most challenging subject in the country. Therefore, students who develop a dislike for it eventually infect others with the "I hate Math" syndrome.

Problem-solving may be difficult for the students. It may be a norm, but addressing it correctly with the proper teaching pedagogy may resolve the issue.

Table 3. Overall Evaluation of Electro1 Workbook

Scale	Percent (%)
Good	84
Fair	16
Poor	0
Total	100

It can be gleaned from Table 3 that 84% of the respondents remarked "good" the overall evaluation of the Basic Electricity workbook. Of course, many factors other than the instructor's teaching competence can affect the general assessment of learning material. This may include prior knowledge, students' preconceptions, interest, alignment of the objectives, clarity and inclusions of related activities.

4. Discussion

Findings. The following findings were observed in the conduct of the study.

1. By and large, respondents agreed that the workbook's content was well organized and well planned, learning objectives were established, activities included were appropriate. The course content allowed the students to participate in discussion actively.
2. Topic on Electrical Diagram and Symbols was noted to be the most applicable topic in the course. At the same time, the issue on Kirchhoff's Law Problem Solving was considered to be the least applicable for the students.
3. Therefore, 84% of the total respondents evaluated the Electro1 Workbook as "good" for its overall content and usage.

5. Conclusions and Recommendations

This section presents the conclusions and recommendations.

In light of these findings, the following conclusions are drawn:

1. Proper planning and organization of learning material will identify the effectiveness of the teaching and learning process in using such medium. Thus elements like clarity, appropriateness and related activities must be considered.
2. With the most and least relevant topics, students considered topics appropriate whenever it is related and directly addressing one's profession. On the other hand, topics that may not directly connect or relate to the seafaring profession were considered inappropriate topics.
3. Students' overall evaluation on the usage of the Basic Electricity Workbook was remarked as good.

Given the conclusions made, the following measures were recommended:

1. First, the curriculum planner must consider proper planning and content organization of any learning materials. Good planning and organization of learning material will identify the effectiveness of the teaching and learning process in using such medium.
2. With the proper teaching pedagogy, faculty may design the course's content of learning materials that may address the learner's needs. For example, variation of learning activities and assessments may help students continue to engage in learning.
3. Gathering feedback from the users of learning materials may be done regularly to continuously monitor the progress of students' performance in the usage of the workbook.

6. Acknowledgments

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Content Validity and Acceptability of a Developed IOP Workbook in Math (College Algebra and Introductory Plane Trigonometry)

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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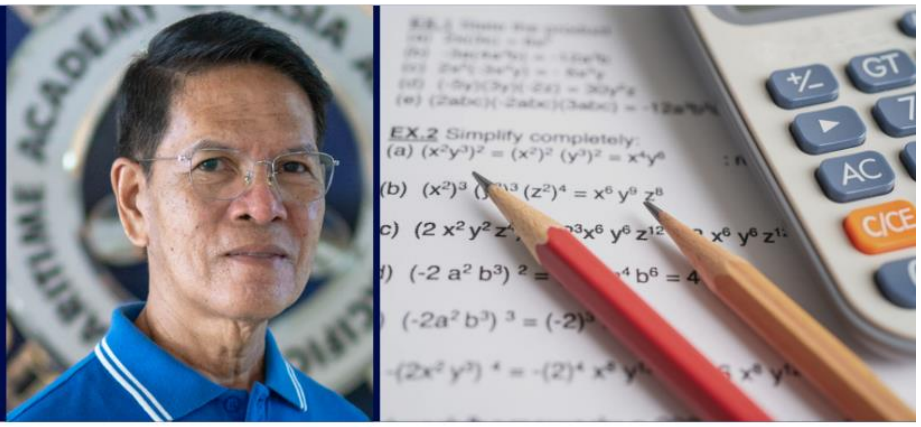

ABSTRACT

Considering the students' difficulty in learning mathematics, a teacher-made math workbook in independent learning is necessary to equip the learners with the required skills for their level. To verify that the developed math workbook improved the academic performance of the IOP students Evangelista, the present study evaluated the content validity and level of acceptability of the same workbook in College Algebra and Plane Trigonometry. The respondents, consisting of 154 students and four (4) instructors, answered the survey form to assess the different features of the workbook, namely learning outcomes, lesson discussion, lessons application, enrichment activities, clarity; usefulness; suitability; adequacy; timeliness; language; style and format; illustrations; and presentation. Likewise, the study tested for the significant difference between the respondents' evaluation and the significant difference between the students' performance in their pre-test and post-test. The study applied the descriptive-correlational method to determine the validity and acceptability of the workbook. The significant difference between the evaluation of teachers and the students, and the pre-test and post-test performance of the students, were determined by using a Quasi-experimental design and employing t-tests, at $\alpha=0.01$, for correlated and independent samples. The findings of this study verified that the developed math workbook was practical because the results showed that its content was very much valid and very much accepted. In terms of workbook's validity and acceptability, there was no significant difference between the students' and the teachers' evaluation. Considering the difference between pre-test and post-test scores, the result revealed that the students' performance significantly improved after using the developed math workbook.

KEYWORDS: *IOP, Post-test, Pre-test, Academic Ramp Program*

1. Introduction

The Indoctrination Orientation Program(IOP), which includes the Academic Ramp Program, is under the admission policy of Maritime Academy of Asia and the Pacific(MAAP). The program offers Mathematics for the qualified Probationary Midshipmen(PM) every summer of the school year.

Math 2, which includes College Algebra and Introductory Plane Trigonometry, was the new course offered during the May 2019 MAAP IOP ramp program. A workbook was developed by the researcher having no instructional material available.

Since there was difficulty in looking for a single textbook that covers both areas of mathematics, it is therefore essential to come up with a new teacher-made mathematics workbook that contains the appropriate lessons aligned to maritime students.

The continuous quest to improve a quality education is global, and it must be science and technology aligned. The Philippine academic institutions take part as an instrument to address students' problems in learning a specific mathematics course. Mathematics requires an in-depth understanding of a more complicated level of learning; thus teachers must untiringly do researches to address the students' preparedness to supplement such learning as the Commission on Higher Education(CHED) mandate to reform the Philippines educational system.

The act of teaching is so complex that it is nearly impossible to claim that a specific way of teaching is superior to other practices. One way of maintaining the interest of the learners is to provide them with activities that they could perform individually after being given proper instructions as a teaching tool like a workbook or module, which could make learning engaging, Adora (2013).

Independent mathematics learning style, at the tertiary level, must be executed in the course delivery. Instructional materials like workbooks play a significant role in achieving such kind of independent learning.

Instructional materials provide ideas and practices which frame classroom activity via text and diagrammatic representations and help teachers at achieving goals that they presumably could not or would not accomplish on their own, Brown (2009).

Teacher-made workbooks are often used at schools and favored because it allows students to work and learn independently, Anderson (2003). Gibbon (2004) stressed the need to develop self-instructional materials with the current shift toward individualized programs in all levels of instruction. Espinar (2016) pointed out that, teachers must develop instructional materials suited to the particular course offerings of the academic institutions.

Bacay (1984) believed that, the instructional materials designed by the teacher are much better than those found in the textbooks since they are prepared and written for specific groups of students.

Objectives. The study aimed to:

1. Validate and determine the validity level of the math workbook that features learning outcomes, lesson inputs, lesson discussion and enrichment activities;
2. Determine the level of acceptability of the workbook in terms of its clarity, usefulness, suitability, adequacy, timeliness, language style and format, illustrations and presentation;
3. Determine the significant difference between the teacher and student evaluation; and
4. Determine the significant difference between the pre-test and post-test performance of the students.

Review of Literature. The study of Espinar and Ballado [6] revealed the significant difference between the respondents' evaluation of the developed work text in Basic Mathematics. Likewise, the study found a significant difference in the pre-test and post-test performance of the students. Their research showed that content validity and acceptability are very much valid and very much accepted. The study also concluded that the work text developed can be used effectively in teaching the course.

Smith (2007) emphasized that teachers were encouraged by their immediate superiors to develop instructional materials in teaching mathematics to make the subject matter better understood by the students.

In the study of Gray (2007), he concluded that the use of a workbook is beneficial and gives not only high scores on standardized assessments but also helps increase the power of self-direction, retention, skills in fundamental processes, reasoning ability and solving problems of the learners.

The study of Adora (2013) found the majority of the respondents strongly agreed that the developed workbook was very much valid, and she recommended it for use in elementary mathematics classes.

One way to teach mathematics effectively is by using a workbook, which is self-contained and has independent instructional material focused primarily on some well-defined objectives, Tabing-Ilano (2008). The respondents in her study strongly agreed that the developed workbook was acceptable and good enough for students' use.

Telaumbanua (2017) pointed out that the developed module in mathematics based on meta-cognitive strategy in improving students' math problem-solving ability was practical because there was an improvement in their math-problem solving skills.

In her study, Torrefranca (2017) revealed that all evaluators strongly agreed that the validated instructional modules on rational expressions and variations registered a significant change in the students' pre-test and post-test scores.

Macarandang (2009) featured in her study that self-instructional modules promote self-paced learning, which allows a learner to work at his own pace rather than the group' pace, and is available any time and at any place.

Significance of the Study. This study on content validity and acceptability of a developed IOP Workbook in Math 2, if materialized, will eventually support the Academic Ramp Program of MAAP in enhancing the math ability of the probationary midshipmen. The material is suited for independent learning and the same can help the students in individualized instructions as a way of exposing them to Outcome Based Education (OBE) learning style. Since the workbook is intended for independent learning, the same teacher-made instructional material will help guide different types of learners in understanding the lessons, from the simplest to the most complicated topics. It can be learned at their own pace.

This study considered two (2) basic hypotheses: (1) There is no significant difference between the evaluation of the teachers and the students regarding workbook validity and acceptability. (2) There is no significant difference between the pre-test and post-test math performance of the students during the IOP.

2. Methods

This study utilized descriptive research method to evaluate the developed math workbook. This workbook was designed according to the contents of the IOP course offering during the summer of 2019.

To determine the validity and acceptability of the workbook, the study applied the descriptive-correlational method similar to the study of Espinar and Ballado (2016).The Quasi-experimental design was used to determine the validity and acceptability of the workbook. The significant difference between the evaluation of teachers and the students as well as the pre-test and post-test performance of the students were determined by employing t-tests for correlated and independent samples. The respondents, consisting of 154 students and four (4) instructors, were given the checklist (Survey/Evaluation form), which was patterned from the study of Adora (2013), for the evaluation of the different parts of the workbook. The validity of the workbook's content was assessed in terms of its learning outcomes, lesson discussion, and enrichment activities. For the level of acceptability, the workbook was assessed in terms of its clarity, usefulness, suitability, adequacy, timeliness, language, style and format, and presentation.

To test the workbook's acceptability and effectiveness, the pre-test of the PM was compared with the same groups' post-test after exposing them to the developed workbook. The difference was tested at a 0.01 level of significance by using t-tests concerning correlated and independent samples. The interpretation level of validity and acceptability scales used were similar to that of Espinar and Ballado (2016), as shown below.

Scales	Content Validity Interpretation	Content Acceptability Interpretation
4.20 – 5.00	Very Much Valid (VMV)	Very Much Acceptable (VMA)
3.40 – 4.19	Much Valid (MV)	Much Acceptable (MA)
2.60 – 3.39	Valid (V)	Acceptable (A)
1.80 – 2.59	Less Valid (LSV)	Less Acceptable (LSA)
1.00 – 1.79	Least Valid (LEV)	Least Acceptable (LEA)

3. Results and Discussions

3.1 Part 1. This part presents the result of analyzing data on the validity and acceptability of the Math 2 workbook

Table 1.1. *Evaluation on the validity of the workbook's learning outcomes*

The learning outcomes of the workbook are	Mean			Interpretation
	Teachers	Students	Total	
1.1 relevant to the topics of the ramp program's refresher course	5.00	4.75	4.88	VMV
1.2 specific and clearly stated	4.80	4.60	4.70	VMV
1.3 measurable	4.80	4.38	4.59	VMV
1.4 attainable	4.40	4.25	4.33	VMV
1.5 result oriented	4.60	4.32	4.46	VMV
1.6 time-bound	3.60	4.34	3.97	MV
Section Mean	4.53	4.44	4.49	VMV

As presented in Table 1.1, an average mean of 4.88 indicates that, the learning outcomes of the workbook are relevant to the topics of the academic ramp program. They are specific and clearly stated, measurable, attainable, and result oriented. Time-bound obtained the lowest average mean of 3.97,

which can be attributed to the time the workbook is utilized for the full course delivery. There may be some topics in the workbook that need enough time to discuss/explain to attain the learning outcome fully. In general, with a section mean of 4.49, the workbook is Very Much Valid in terms of its Learning Outcomes.

Table 1.2. *Evaluation on the validity of the workbook's lesson discussion*

The lesson discussions of the workbook	Mean			Interpretation
	Teachers	Students	Total	
2.1 give insight and ideas of what the topics are all about	5.00	4.68	4.84	VMV
2.2 provide a background of concepts and information about the topic	4.80	4.44	4.62	VMV
2.3 simple and comprehensible	4.80	4.54	4.67	VMV
2.4 attract students' attention	4.00	4.42	4.21	VMV
2.5 arouse students' interest	3.80	4.67	4.24	VMV
Section Mean	4.48	4.55	4.52	VMV

Regarding the workbook's lesson discussion, Table 1.2 shows that an average mean of 4.84 explains that this section of the workbook gives insight and ideas of what the topics are about. It provides the background of concepts and information about the subject, and it is simple and understandable. On the other hand, a mean average of 3.8 explains that, the teachers consider the workbook more attractive to arouse the interest of the learners. The section mean of 4.52 indicates that, the workbook with respect to lesson discussion is Very Much Valid.

Table 1.3. *Evaluation on the validity of the workbook's lesson application*

The lesson application of the workbook is	Mean			Interpretation
	Teachers	Students	Total	
3.1 in accord with the course objectives	5.00	4.72	4.86	VMV
3.2 relevant to the lesson objectives	5.00	4.61	4.81	VMV
3.3 properly sequenced	4.60	4.34	4.47	VMV
3.4 accomplishable according to schedule	3.80	4.64	4.22	VMV
3.5 interesting	4.40	4.71	4.56	VMV
3.6 adequate to develop students' mathematical knowledge and skills	4.80	4.52	4.66	VMV
3.7 appropriate to students' abilities	4.00	4.64	4.32	VMV
3.8 sufficient to determine the mastery level of students	4.00	4.62	4.31	VMV
Section Mean	4.45	4.60	4.53	VMV

Table 1.3 presents the evaluation results on the validity of the workbook regarding lesson application. With a mean average of 4.86, the data shows that, the lesson application part of the workbook agrees with the course objectives. It is relevant, and adequate to develop the students' mathematical knowledge and skills. Results also show a mean average of 4.22. This indicates a very minimal reason to accomplish the lessons on time. The section mean of 4.53 proved that the lesson application section of the workbook is Very Much Valid.

Table 1.4 shows the evaluation results on the validity of the workbook regarding enrichment activities. With a mean average of 4.70, it can be deduced that, the student activities enhance very much the mathematical understanding of the learners. Likewise, the activities are very much challenging, stimulate higher-order thinking skills, and measure what has been learned. Thus, the section mean of 4.60 proves that the workbook, concerning enrichment activities, is Very Much Valid.

Table 1.4. *Evaluation on the validity of the workbook's enrichment activities*

The enrichment activities of the workbook	Mean			Interpretation
	Teachers	Students	Total	
4.1 are adapted to the students' level of comprehension	4.20	4.87	4.54	VMV
4.2 are challenging	4.60	4.71	4.66	VMV
4.3 are well constructed	4.40	4.62	4.51	VMV
4.4 stimulates higher-ordered thinking skills	4.60	4.65	4.53	VMV
4.5 are adequate and enough to determine students' mastery level	4.40	4.66	4.53	VMV
4.6 measures what has been learned	4.60	4.63	4.62	VMV
4.7 enhances mathematical understanding and skills	4.80	4.60	4.70	VMV
4.8 facilitates developing high-level mathematical problem and thinking skills	4.60	4.54	4.57	VMV
Section Mean	4.53	4.66	4.60	VMV

Table 1.5. *Summary of the evaluation results on the validity of the workbook*

Part of the Workbook	Mean			Interpretation
	Teachers	Students	Total	
learning outcomes	4.53	4.44	4.49	VMV
lesson discussion	4.48	4.55	4.52	VMV
lesson application	4.45	4.60	4.53	VMV
enrichment activities	4.53	4.66	4.60	VMV
Grand Mean	4.50	4.56	4.53	VMV

Table 1.5 presents the summary of the evaluation results on the validity of the workbook. The enrichment section of the workbook revealed the highest average of 4.60. This indicates that this part of the workbook satisfies the mathematical need of the learners. The activities are challenging, stimulates higher-order thinking skill, and measures what has been learned. The learning outcomes section of the workbook got the lowest average of 4.49. Though, it is interpreted very much valid, it also suggests that, learning outcomes in terms of measurability, attainability, and time-bound must be improved. With a grand mean of 4.53, both the students and the teachers agreed that, in terms of learning outcomes, lesson discussion, lesson applications, and enrichment activities, the developed workbook is Very Much Valid. This conforms to the findings of Adora [2] on mathematics performance as a basis in developing a workbook in mathematics.

Table 1.6. *Evaluation on the acceptability level of the workbook in terms of clarity*

There is clarity in the workbook because the	Mean			Interpretation
	Teachers	Students	Total	
1.1 information is clear and simple	4.40	4.68	4.54	VMA
1.2 language used is clear and easy	4.60	4.59	4.60	VMA
1.3 concepts of each activity are arranged logically	4.40	4.12	4.26	VMA
1.4 information suits students' level of comprehension	4.40	4.01	4.21	VMA
Section Mean	4.45	4.35	4.38	VMA

Table 1.6 shows the evaluation results on the acceptability of the workbook in terms of clarity. It can be seen from the table that, with a mean average of 4.54 and 4.60, there is clarity for the workbook because of its clear information and simple use of language, respectively. On the other hand, an average of 4.26 and 4.21 means that improvement must be done on the part of the logical arrangement of the activities and information regarding student's comprehension level. With a section mean of 4.38, the teachers and the students agreed that, the workbook is Very Much Acceptable.

Table 1.7. *Evaluation on the acceptability level of the workbook in terms of usefulness*

The workbook is helpful because it	Mean			Interpretation
	Teachers	Students	Total	
2.1 prepares the students to think logically and critically	4.80	4.54	4.67	VMA
2.2 is simple and understandable	4.80	4.62	4.71	VMA
2.3 has contents that increase the student's knowledge, understanding, and proficiency skills	4.80	4.65	4.73	VMA
2.4 provides an opportunity for the development and enhancement of mathematical skills	5.00	4.48	4.74	VMA
2.5 has learning content that provide adequate information on the topics presented	4.80	4.32	4.57	VMA
2.6 encourages the students to become actively involved in the learning activities	4.60	4.62	4.61	VMA
2.7 stimulates the learner's analytical thinking skills	5.00	4.41	4.71	VMA
Section Mean	4.83	4.52	4.68	VMA

Concerning the workbook's usefulness, the evaluation results is presented in Table 1.7. A mean average of 4.74 are an indicator that, the workbook provides the learners the opportunity to develop and enhance their mathematical skills. It increases their knowledge and understanding, and stimulate analytical thinking skills. An average mean of 4.57 suggests that, the learning content of the workbook must provide sufficient information on the topics presented. The section mean of 4.68 proves that the workbook is Very Much Acceptable.

Table 1.8. *Evaluation on the acceptability level of the workbook in terms of suitability*

In terms of the workbook's suitability the	Mean			Interpretation
	Teachers	Students	Total	
3.1 activities take into consideration the varying attitudes and capabilities of the learners	4.20	4.40	4.30	VMA
3.2 activities are suitable for the topic	4.80	4.35	4.58	VMA
3.3 activities are relevant, engaging, and self-motivating	4.60	4.22	4.41	VMA
3.4 enrichment activities are adaptable to classes with a large number of students	4.60	4.27	4.44	VMA
Section Mean	4.55	4.31	4.43	VMA

Table 1.8 shows the evaluation results on the acceptability of the workbook concerning, to its suitability. It can be seen from the table that, with an average of 4.58, the activities are suitable to the topic because, the enrichment exercises are relevant, engaging, self-motivating and adaptable to classes with a large number of students. An average of 4.30 explains that, enhancement of the activities must be considered to challenge the varied attitudes and capabilities of the learners. The section mean of 4.43 indicates that the workbook is Very Much Acceptable to both the teachers and the students.

Table 1.9 presents the evaluation results of the workbook in terms of adequacy. A mean of 4.80 indicates that the workbook is adequate because, it covers all the topics included into the refresher course, it provides enough activities to increase the students' knowledge, skills, attitudes, and it explains and applies the different mathematical concepts and principles. A mean average of 4.32 suggests that, varied problem-solving strategies must be incorporated in the workbook so that the learners become more skillful in analyzing and solving the different mathematical problem applications. With a section mean of 4.61, the two types of respondents agreed that the workbook is Very Much Acceptable.

Table 1.9. *Evaluation on the acceptability level of the workbook in terms of adequacy*

In terms of adequacy, the workbook	Mean			Interpretation
	Teachers	Students	Total	
4.1 covers topics included in the academic ramp program's refresher course	5.00	4.59	4.80	VMA
4.2 provides sufficient information on each topic	4.80	4.38	4.59	VMA
4.3 provides expected learning	5.00	4.42	4.71	VMA
4.4 contains a variety of solving strategies	4.20	4.43	4.32	VMA
4.5 defines important terms for reinforcement	4.60	4.31	4.46	VMA
4.6 provides enough activities to increase students' knowledge, skills, and attitudes	4.80	4.71	4.76	VMA
4.7 explains and applies concepts and principles	4.60	4.66	4.63	VMA
Section Mean	4.71	4.50	4.61	VMA

Table 1.10. *Evaluation on the acceptability level of the workbook in terms of timeliness*

The validation and use of the workbook is timely because	Mean			Interpretation
	Teachers	Students	Total	
5.1 it is one of the tools for quality learning	4.80	4.71	4.76	VMA
5.2 teachers are encouraged to produce workbook/work text or modules to make teaching – learning effective	4.80	4.66	4.73	VMA
5.3 students need instructional materials where they could apply what had been discussed in the classroom	4.80	4.46	4.63	VMA
Section Mean	4.80	4.61	4.71	VMA

Table 1.10 shows the evaluation results of the workbook regarding timeliness. Workbook as one of the tools for quality learning got the highest mean of 4.76. It is followed by a mean of 4.73 for the criteria that encourage teachers to develop a learning material, that will make teaching and learning effective. The lowest mean of 4.63 suggests that the students need more learning materials where they can study and apply what has been discussed in the classroom. With a section mean of 4.71, the respondents agreed that, the workbook is Very Much Acceptable.

Table 1.11. *Evaluation on the acceptability level of the workbook in terms of language, style, and format*

The format and style of the workbook satisfy	Mean			Interpretation
	Teachers	Students	Total	
6.1 appropriate use of illustrations	4.60	4.52	4.56	VMA
6.2 proper spacing of items	4.60	4.48	4.54	VMA
6.3 use of the optimum print size	4.40	4.80	4.60	VMA
6.4 variation in the positioning of the response section	4.80	4.42	4.61	VMA
6.5 the observation of correct grammar	4.40	4.76	4.58	VMA
6.6 clear and comprehensive language in terms of vocabulary	4.60	4.61	4.61	VMA
6.7 sufficient familiar vocabulary to ensure learning	4.60	4.58	4.59	VMA
6.8 appropriate structure, style, and format of the target level	4.80	4.55	4.68	VMA
Section Mean	4.60	4.59	4.60	VMA

Table 1.11 presents the evaluation results of the workbook with respect to language, style and format. A mean of 4.68 indicates that, the workbook satisfies the criteria because of its appropriate structure, style, and format for the target level. In terms of the vocabulary, it is clear and uses comprehensive language, satisfies the variation in positioning the response section and uses optimum font size. Both the teachers and the students agreed that with a section mean of 4.60, the workbook is Very Much Acceptable.

Table 1.12 presents the evaluation results of the workbook regarding illustration. A mean of 4.78 indicates that the illustrations used in the workbook are clear and straightforward to arouse students' interest in learning. They are very relevant to the different topics. On the other hand, a mean of 4.25

recommends that, more concrete visual clues be provided in the workbook to guide the students better to follow directions. A section mean of 4.55 is an evidence that, the workbook are Very Much Acceptable.

Table 1.12. *Evaluation on the acceptability level of the workbook in terms of illustrations*

The illustrations used in the workbook	**Mean**			**Interpretation**
	Teachers	**Students**	**Total**	
7.1 are clear and simple	4.60	4.75	4.68	VMA
7.2 arouse students' interest, making learning effective and easy	4.60	4.61	4.61	VMA
7.3 provide concrete visual clues	4.40	4.10	4.25	VMA
7.4 guide students to follow directions	4.60	4.28	4.44	VMA
7.5 relevant to the topic	4.80	4.76	4.78	VMA
Section Mean	4.60	4.50	4.55	VMA

Table 1.13. *Evaluation on the acceptability level of the workbook in terms of presentation*

Presentation of	Mean			Interpretation
	Teachers	Students	Total	
8.1 topics is logical and orderly	4.60	4.45	4.53	VMA
8.2 directions are concise, readable, and easy-to-follow	4.60	4.70	4.65	VMA
8.3 topics fit the sequence of the course	4.60	4.65	4.63	VMA
Section Mean	4.60	4.60	4.60	VMA

Table 1.13 reveals the evaluation results of the workbook concerning presentation. With an average mean of 4.65, it can be said that the workbook provides a concise, readable and easy-to-follow direction and presents the topics that fit the sequence of the course. The lowest mean of 4.53, though interpreted very much acceptable, suggests that there is still a need to improve on the logical and orderly presentation of the topic. With a section of 4.60, the respondents agreed that the workbook is Very Much Acceptable.

Table 1.14. Summary of the evaluation results on the acceptability of the workbook

Criteria	**Mean**			**Interpretation**
	Teachers	**Students**	**Total**	
clarity	4.45	4.35	4.40	VMA
usefulness	4.83	4.52	4.68	VMA
suitability	4.55	4.31	4.43	VMA
adequacy	4.71	4.50	4.61	VMA
timeliness	4.80	4.61	4.71	VMA
language, style, format	4.38	4.59	4.49	VMA
illustrations	4.60	4.50	4.55	VMA
presentation	4.60	4.60	4.60	VMA
Grand Mean	4.62	4.50	4.56	VMA

Table 1.14 summarizes the evaluation results on the level of acceptability of the workbook. As shown in the table, timeliness got the highest section mean of 4.71. It indicates that, since a workbook is one of the tools for quality learning, it is very timely that the teachers develop a workbook that is appropriately useful in the Math refresher course. The table shows that clarity ranked the lowest among the eight criteria. The result suggests that improvement in the workbook concerning, clear information and use of simple language in the lesson and discussion must be considered. The logical arrangement of the concepts in each activity and the information that suits the students' level of comprehension must also be modified. As a whole, a grand mean of 4.56 reveals that, in terms of timeliness, usefulness, adequacy, presentation, illustrations, language style and format, suitability, and clarity, the workbook is Very Much Acceptable. This conforms to the findings of Tabing and Ilano [10], where the respondents in her study strongly agreed that, the developed and validated workbook in Algebra was acceptable and good enough for students' use.

Part 2. This part presents the discussion, analysis, and interpretation of the hypotheses testing carried out.

Table 2.1 compares the students' and teachers' evaluations concerning the workbook's validity and acceptability. Since the number of teachers is widely different from the 154 student evaluators, a one-samples t-test was used. The teachers' mean evaluation rating was considered as the test value.

Table 2.1: *One-sample t-test for the Students' and the Teachers' Evaluation of the Validity and Acceptability of the Workbook in Math 2*

Workbook Evaluation Area	Test value = Teacher's Mean	Student		One-sample *t*-test		
		Mean	SD	|t|	p-value	Cohen's D
validity	4.50	4.56	3.246	0.20	.819	0.02
acceptability	4.62	4.50	3.125	0.50	.634	0.04

In terms of validity, result of the one-sample t-test indicated that there is a non-significant very small difference between Student Evaluation and the teachers' mean being the test value (M=4.50), t(153) = 0.2, p = .819, Cohen's D = 0.02. The effect size measure, Cohen's D, of 0.02, indicating no practical significance, supports the non-significant result of the one-sample t-test. Hence, the hypothesis of no significant difference between teachers' and students' evaluation of the workbook validity was not rejected. This result is what the researcher was hoping to obtain as it would be ideal that both teacher and student evaluators have considerably high regard for the validity of the math workbook.

Regarding acceptability, the one-sample t-test result showed a non-significant, very small difference between student evaluation and the test value (4.62), which is the teacher's mean rating, t(153) = 0.5, p=.634, Cohen's D = 0.04. Cohen's D value also suggests no practical significance. Thus, the null hypothesis of no significant difference was not rejected. The data did not provide sufficient evidence to show that teachers and students differ in evaluating the workbook's acceptability.

Table 2.2 presents the Paired *t*-test for Correlated Means on the pre-test and posttest Math performance of the students during the Academic Ramp Program.

Table 2.2: *t-test for Significant Difference between Two Correlated Means*

Academic Ramp Math Plus	d	s_d^2	s_d	*t* $\propto = 0.01$	computed
pre-test post-test	1153	28.15	5.31	2.326	17.49

Effect size???

The developed math workbook was used by the students. After the duration of the academic ramp program, the hypothesis of no significant difference between the students' performance in the pre-test and post-test was subjected to t-test analysis concerning difference between two correlated means. At a 0.01 level of significance, the tabular value of *t* is 2.326. Considering the difference between pre-test and post-test scores, the *t* value was determined. The computed value of *t*, which is 17.49, is greater than 2.326 (hypothesis rejected); hence the result revealed that the students' performance significantly improved after using the workbook.

4. Conclusions and Recommendations

After evaluating the workbook's validity and level of acceptability, both the teachers and the students strongly agreed that the workbook is very much helpful and acceptable for use during the math academic ramp program.

The validity and acceptability level of the workbook obtained a grand mean of 4.53 and 4.56, respectively which led to the conclusion that, concerning the different features of the workbook, it is Very Much Valid and Acceptable.

The no-significant difference between the students' and the teachers' evaluation of the validity and acceptability of the workbook is favorable for the use of the workbook.

The no-significant difference between the students' performance in the pre-test and post-test led to the rejection of the hypothesis. Therefore, it can be concluded, that the students' performance significantly improved after using the developed math workbook.

The conclusion conforms to Espinar and Ballado (2016), who found a significant difference in the pre-test and post-test performance of the students in Basic Mathematics. Their research also concluded that content validity and acceptability are valid and very much accepted.

The researcher highly recommends that, the probationary midshipmen use the math workbook during the IOP ramp program because of its effectiveness, usefulness, and acceptable content. It is also recommended that, the same study on content validation be done by the faculty who intends to develop a workbook or a manual in any course offering.

5. Acknowledgment

The researcher acknowledges the extended support of the following MAAP Academic departments in the making of this study. Printing department for the copy propagation of the checklists (Survey/Evaluation form), the office of the CCA for the hard copies of the students' pre-test and post-test scores in IOP level 2 mathematics, the office of the ARU and my function head for the encouragement to finish the study and the MAAP management for mandating the academic personnel to engage in research activities as one priority in leveling up the accreditation status of the academy.

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7. List of Formulas Used

1. $Q_k = L_{Q_k} + \left[\frac{\frac{kN}{4} - cf_b}{f_{Q_k}}\right] i$

2. $\bar{x} = x_0 + \left(\frac{\sum fx'}{N}\right) i$

3. $S^2 = \frac{\sum fx^2 - (\sum fx)^2}{N(N-1)}$

4. $t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left[\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}\right]\left[\frac{n_1+n_2}{n_1 n_2}\right]}}$

5. $s_d^2 = \frac{n(\sum d^2) - (\sum d)^2}{N(N-1)}$

6. $t = \frac{\frac{d}{N}}{\frac{s_d}{\sqrt{N}}}$

Module development for a social science course: An application of Gagne's Nine Events in Instruction

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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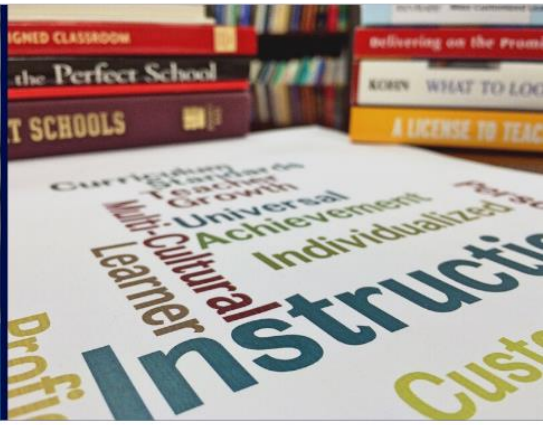


ABSTRACT

Module preparation is an intricate part of the instructional design process. Gagne's Nine Events of Instructions is one of the widely used instructional design models in traditional and especially in e-learning design. This study describes the application of Gagne's model in preparing the course module in a social science course. Teaching strategies and methods utilized in the module were documented to illustrate each of Gagne's nine events of instructions, namely: Gaining attention, describing goals, stimulating prior knowledge, presenting material to be learned, providing guidance for learning, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer. The use of videos, presentations, course guides, task sheets, collaborative activities integrating technology such as Jamboard, Padlets and Google Forms, and the use of written feedback and grading rubrics are some of the strategies used in the module. This study shows that Gagne's sequential ordering of instructional events helps the instructional design process. The teacher evaluation of the course module and qualitative evaluation of 110 students who have used the module is included and guided the revisions for the module. Recommendations for policies about module writing standards are also included.

KEYWORDS: *Module writing process, Learner-centered instructional approaches, Academic development, Instructional design*

1. Introduction

With the introduction of the New General Education Curriculum (NGEC) in Philippine Higher Education Institutions (HEIs) in 2018, the need to develop customized modules became an inevitable the task for teachers (CHED, 2017). To prepare teachers for implementing NGEC courses, the Commission on Higher Education (CHED) provided mandatory training for tertiary teachers. The general objectives of the training were to orient the faculty participants about the philosophy of liberal education, enable them to teach interdisciplinary general education courses using the new materials, develop a pool of trainers, and recognize, share, and disseminate best practices in general education (CHED, 2016). From this required training, teachers were expected to develop their modules or learning packages based on the Learning Plans and sample syllabi issued by the Commission. While HEIs may develop their learning modules, there is a need for satisfactory compliance with mandatory requirements in terms of scope and standards of instruction. Owing this, module preparation became an extended component in the tri-focal functions of teachers.

Module writing and development is an element of instructional design. The tedious process of module preparation involves careful consideration of variables, particularly determining course outcomes and designing teaching, learning, and assessment activities (TLAs) appropriate to the program of study and curriculum. In particular, Gagne's Nine Events of Instructions interested the many instructional models in this study. Gagne's (1968, 1985) instructional design model is based on the information processing model and is an effective program for structuring a lesson plan. Its principal element of hierarchical sequencing works well in outcomes-based education, where the primary focus is on learning outcomes and sequencing tasks to achieve those outcomes.

Module preparation, more specifically, involves the practical application of teaching competence and knowledge in selecting appropriate teaching strategies, designing learner-centered activities, and developing assessments. Aside from these teaching competencies, the teacher ensures that the learning package or modules comply with the institution's evaluation standards regarding the structure and writing protocols.

In 2020, the Department of Academics institutionalized the components of learning modules for classroom use. For example, the module at the Maritime Academy of Asia and the Pacific (MAAP) prescribes the following structure: Overview; learning objectives; keywords and concepts; content, lectures, readings and assignments; additional resources; assessment and evaluation; and summary and reflection.

This research is anchored on addressing two issues related to instructional design and module writing. The first issue focuses on determining the course's scope and content; the second centers on the crucial steps and procedures in developing the instructional guide and course materials. In order to address these two issues, the researcher developed a module in NGEC 2- Readings in Philippine History applying Gagne's Nine Steps in Instructional Preparation.

Literature Review. Robert Gagne is one of the influential figures in the area of instructional design and instructional technology (Reiser & Dempsey, 2007; Joyce & Well (1996); Glatthorn, Boschee, & Whitehead, 2009; and Gagne, Wager, Golas and Keller, 2005). In 1965, Gagne made a significant contribution (Joyce & Weil, 1996) to learning theory by describing the five domains or types of learning outcomes that require a different set of instructions to promote learning and to control and predict outcomes in schools (Glatthorn, Boshee & Whitehead, 2009). Gagne's theory is classified as an instructional theory because it seeks to describe the conditions under which one can intentionally arrange for the learning of specific performance outcomes. Gagne's (1988) instructional

theory has three major elements. First, it is based on a taxonomy, or classification, of learning outcomes. Second, it proposes particular internal and external conditions necessary for achieving these learning outcomes. Furthermore, third, it offers nine events of instruction, which serve as a template for developing and delivering a unit of instruction. Gagne's description of the various types of learning outcomes and the events of instruction remains the cornerstones of instructional design practices (Reiser & Dempsey, 2007).

Gagne's theory stipulated that there are several different types or levels of learning. The significance of these classifications is that each type requires different types of instruction. Gagne (1977) identified five major categories of learning: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes. Different internal and external conditions are necessary for each type of learning. For cognitive strategies to be learned, there must be a chance to practice developing new solutions to problems. The learner must be exposed to a credible role model or persuasive arguments to learn attitudes. In other words, samples of desired outcomes should be provided to the students.

Gagne suggested that learning tasks for intellectual skills could be organized in a hierarchy according to complexity: stimulus recognition, response generation, procedure following, use of terminology, discriminations, concept formation, rule application, and problem-solving. The hierarchy's primary significance is identifying prerequisites that should be completed to facilitate learning at each level. Prerequisites are identified by doing a task analysis of a learning or training task. Learning hierarchies provide a basis for the sequencing of instruction.

Gagne posited an instructional model consisting of nine sequential activities, namely: Gaining attention, informing the learner of the objective, stimulating recall of prior learning, presenting the stimulus, providing learning guidance, eliciting performance, providing feedback, assessing performance and enhancing retention and transfer (Hanson and Asante, 2014; Gagne et al. 2005; Reiser and Dempsey, 2007; Joyce and Weil, 2003; and Tuckman & Monetti, 2011). Although all steps are necessary, Gagne implies that the events of instruction may not be sequential and must not be followed in a particular order. However, teachers may use them at a particular point and time, depending on the classroom setting, nature of the topic, nature of the learners and many other variables that differentiate learning situations (Reiser & Dempsey, 2007). This issue of sequential order is examined closely in this project.

Informed by the findings of previous studies on the advantages of using Gagne's model, this researcher wanted to seek answers to the following research questions:

1. How does the module differ from the syllabi of other maritime schools in terms of topics, course outcomes, and the number of primary references used?
2. Which of Gagne's instructional events were evident in the module developed?
3. What were the peer evaluators' qualitative comments on the module's development?
4. What were the qualitative comments of the students after using the module?

2. Methods

This research used the descriptive qualitative method. In addition, documentary analysis was used to compare the learning plan developed by CHED and other maritime schools to determine the answers to research questions 1.

Reflective teaching journals were used as primary data to answer research question 2. Thematic analysis was used to identify the required learners' productive skills using Gagne's Nine Steps in Instructional Preparation as the framework for the study.

Qualitative methods were employed in the evaluation phase of the module. The teacher's self-assessment, the students' thoughtful comments, and the peer-evaluation of the module provided the impetus for the revisions of the module.

The development of this module is progressive. This project involved three stages of development. Phase 1 involved materials development. Phase 2 involved Classroom Pilot. Phase 3 involved Post-Pilot Materials Revision. The iteration took two academic terms, spanning four years.

3. Results

This section presents the results and findings of this study. The presentation of data follows the order of the research questions.

1. How does the module differ from the sample syllabi regarding topics, course outcomes, and the number of primary references used?

To answer this question, the sample course syllabus from CHED was examined. Using comparative analysis, the contents and scope of the NGEC 2 module were compared with the CHED Sample Syllabus as the benchmark. Table 1 presents the comparison.

Table 1. Comparison of the Contents of the Syllabi

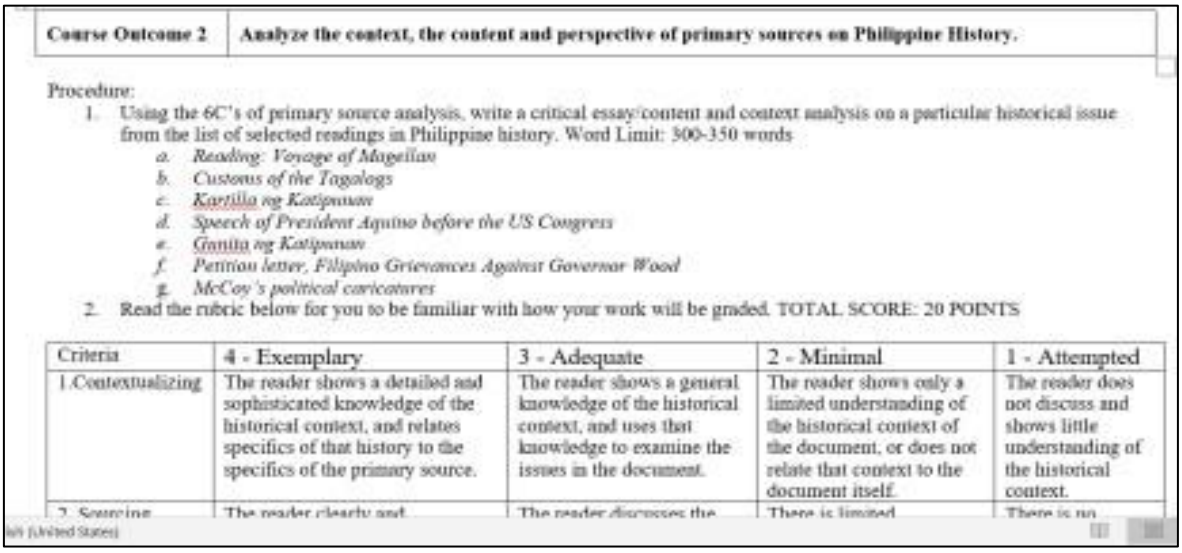
	Sample Syllabi	Module	Remarks
Number of topics	13	17	Agrarian reform and taxation were not included. Instead, Martial Law was included as a particular topic. Essential concepts were also introduced as building blocks toward completing the tasks.
Number of course outcomes	9	5	Some course outcomes were merged so that there will be fewer course outcome assessments.
Number of primary sources used as reference	17	21	Twenty-one primary references were used. The accompanying Reader prepared specially for use in the course includes these references and readings.

There were changes made in the topics. Instead of Agrarian Reform and Taxation, the evolution of the Philippine Constitution and Martial law were included. Maritime professionals like most overseas foreign workers (OFWs) are tax-exempt; thus, taxation may not be relevant to the students. Martial law and the evolution of the constitution were included in lieu of taxation and agrarian reform. An understanding of the constitution provides a good background in understanding labor and foreign policies which directly affect the future professional lives of the students. Key historical concepts like historical method and primary source analysis were used in the module. These methods of analysis are commonly used in structuring and developing critical analysis of content and context. Researches cannot accept historical data at face value, since many diaries, memoirs, reposts and testimonies are written to enhance the writer’s position, stature, or importance. Because of this possibility, historical data has to be examined for the authenticity of the primary source and truthfulness of the contents. Such examination is done through criticism. This skill is a core competence among students of history.

Other necessary study skills were included in the module, either as a practice activity or a skill-building activity. Examples of these skills are paraphrasing, summarizing, outlining, paragraph-writing, referencing, rhetorical patterns for persuasive speaking, debating, and essay-writing. In Gagne’s model, the identification of student-skills is included in the instructional phase (presenting material or

the selective reception phase). Carefully selected samples of writing were provided as reference guides for the students.

The course outcomes were adjusted in consideration of the time constraints. Instead of nine outcomes, the module had five course assessments. Combined outcomes consisted both the product (for example, a critical analysis paper for content and context) and content (for example, selected primary source). An example is shown below:



Course Outcome 2	Analyze the context, the content and perspective of primary sources on Philippine History.

Procedure:

1. Using the 6C's of primary source analysis, write a critical essay/content and context analysis on a particular historical issue from the list of selected readings in Philippine history. Word Limit: 300-350 words
   a. *Reading: Voyage of Magellan*
   b. *Customs of the Tagalogs*
   c. *Kartilla ng Katipunan*
   d. *Speech of President Aquino before the US Congress*
   e. *Ganito ng Katipunan*
   f. *Petition letter, Filipino Grievances Against Governor Wood*
   g. *McCoy's political caricatures*
2. Read the rubric below for you to be familiar with how your work will be graded. TOTAL SCORE: 20 POINTS

Criteria	4 - Exemplary	3 - Adequate	2 - Minimal	1 - Attempted
1.Contextualizing	The reader shows a detailed and sophisticated knowledge of the historical context, and relates specifics of that history to the specifics of the primary source.	The reader shows a general knowledge of the historical context, and uses that knowledge to examine the issues in the document.	The reader shows only a limited understanding of the historical context of the document, or does not relate that context to the document itself.	The reader does not discuss and shows little understanding of the historical context.
2. Sourcing	The reader clearly and	The reader discusses the	There is limited	There is no

Figure 1: Sample course assessment

During the first offering of the course in 2018, there were a few primary references that were not accessible. Due to lack of access to these primary references some abridged versions or secondary sources were used. However, in this module, all the primary sources have been made available after intensive research was conducted by the researcher. The references were sourced from open-access sources like Gutenberg. In all 21 primary sources were included in the module.

Changes in the content of the module were initiated to provide the background knowledge, skill- building activities, as well as the desired products of learning or learning indicators set in the course.

2. What instructional events were evident in the module developed?

Table 2 shows the sample activities and instructions found in the module. Applying Gagne's Instructional Model, the activities/tasks/strategies used in the module are briefly described.

Table 2- Gagne's Nine Events of Instructions applied in NGEC 2 Module

Event	Actions Done
1. Gaining attention	Use of YouTube videos, ice-breaker activities, presentations, and discussion of related current events to introduce the material
2. Describing the goals	Use of presentation slides that show the learning outcomes for each topic and how it connects to the course outcomes; learning objectives and outcomes were included in the syllabus, course guide, and module.
3. Stimulating prior knowledge	Review of past lessons

Event	Actions Done
4. Presenting material to be learned	Use of videos, graphic images of the authors, discussion boards such as *Jamboard* and *Padlet*, use of technology such as Google stream and Google Question in the Google Classroom for the delivery of the content
5. Guiding learning	Inclusion of grading rubrics and instructions in Google docs for all the activities, including assessments
6. Eliciting performance	Utilizing individual, pair-work, triads, group, and class activities to apply to learn; Scaffolding course assessments with smaller formative assessments and assignments so that students can practice and receive feedback before their major individual assessments
7. Providing feedback	All individual essays were marked and returned with written feedback from the instructor.
8. Assessing performance	Use of a variety of assessment methods: an annotated bibliography, historical analysis, recorded individual persuasive speeches; video presentation; argumentative essays; dance presentation
9. Enhancing retention and transfer	Ending lessons with reflection questions

Gagne's Nine Events (1985) is the sequential ordering of events related to instructions. Each step is discussed with examples evidenced in the module. In order for any learning to take place, the students' attention must be captured. Common steps are using a multimedia program that begins with an animated title screen sequence accompanied by sound effects or music startles the senses with auditory or visual stimuli. Another way to capture students' attention is to start each lesson with a thought-provoking question or interesting fact. In the module, Step 1- Gaining attention (Reception) was illustrated with the use of YouTube videos, ice-breaker activities, presentation, discussion of related current events, and similar teacher-initiated activities to introduce the material. The most common question is asked regarding the students' familiarity with the key concepts which are provided in the module.

In Gagne's Nine Events model, Gagne proposed that in each lesson, students should be given a list of the learning objectives. This initiates the internal process of expectancy and helps motivate the learner to complete the lesson. These objectives should form the basis for assessment as well. Typically, learning objectives are presented in the form of "Upon completing this lesson you will be able to. . . ." as shown in Figure 2.

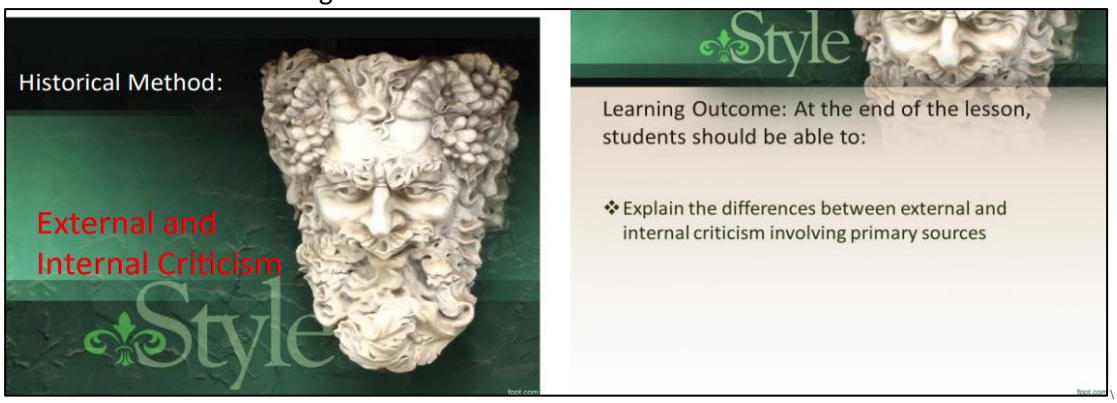


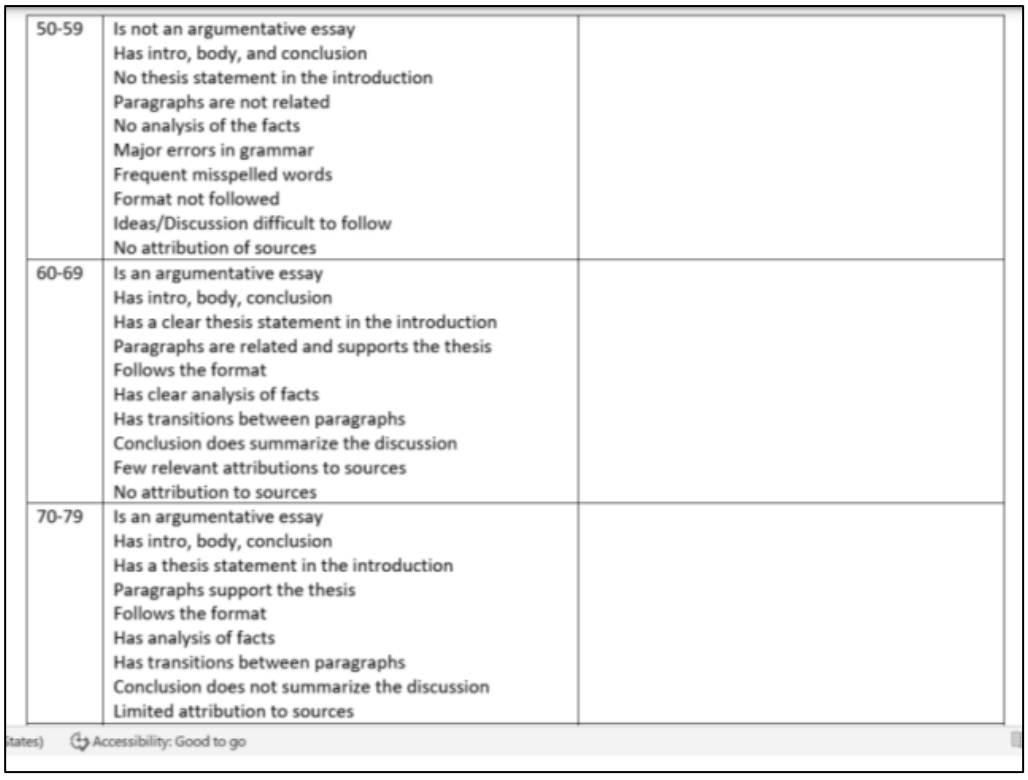
Figure 2: Sample Learning outcome

As shown, Step 2- Describing the goals (Expectancy) was illustrated through the use of presentation slides that show the learning outcomes for each topic and how it connects to the course outcomes. Furthermore, it was noted that learning objectives and outcomes were included in the syllabus and course guide as well.

The third step involves associating new information with prior knowledge that is believed to facilitate the learning process. Gagne (1985) notes that it is easier for learners to encode and store information in long-term memory when there are links to personal experience and knowledge. According to Gagne (1985) a simple way to stimulate recall is to ask questions about previous experiences, an understanding of previous concepts, or a body of content. Step 3- Stimulating prior knowledge (Retrieval) was illustrated by a regular review of past lessons that precedes every new lesson.

Step 4- Presenting material to be learned (Selective Perception) is where the new content is presented to the students. Gagne (1985) suggests that contents should be chunked and organized meaningfully, and typically is explained and then demonstrated. To appeal to different learning modalities, a variety of media should be used if possible, including text, graphics, audio narration, and video. The use of videos, graphic images of the authors, discussion boards such as *Jamboard* and *Padlet*, Google stream and Google Question in the Google Classroom were incorporated in the module. The use of varied and technology-aided strategies was evaluated positively by the students. As an enhancement activity, students were also given additional references in the videos for a concise presentation of lengthy documents. For example, President Corazon Aquino's speech consisted of the video clip as well as the written script to appeal to different student learning modalities.

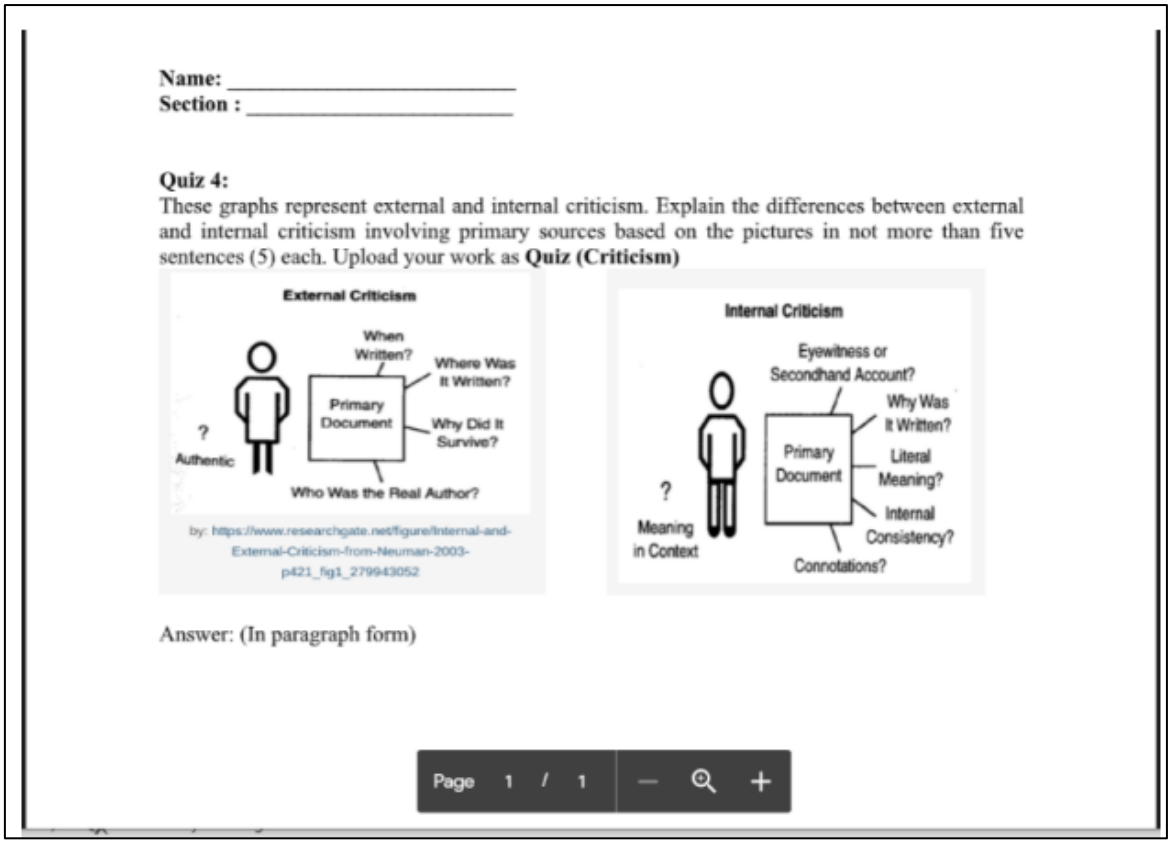
For Step 5- Providing guidance for learning (Semantic Encoding), this was accomplished by including the grading criteria or rubrics (Figure 3) and instructions (Figure 4) in Google docs for all the activities, including assessments.



50-59	Is not an argumentative essay Has intro, body, and conclusion No thesis statement in the introduction Paragraphs are not related No analysis of the facts Major errors in grammar Frequent misspelled words Format not followed Ideas/Discussion difficult to follow No attribution of sources	
60-69	Is an argumentative essay Has intro, body, conclusion Has a clear thesis statement in the introduction Paragraphs are related and supports the thesis Follows the format Has clear analysis of facts Has transitions between paragraphs Conclusion does summarize the discussion Few relevant attributions to sources No attribution to sources	
70-79	Is an argumentative essay Has intro, body, conclusion Has a thesis statement in the introduction Paragraphs support the thesis Follows the format Has analysis of facts Has transitions between paragraphs Conclusion does not summarize the discussion Limited attribution to sources	

tates) Accessibility: Good to go

Figure 3: Sample grading criteria for an argumentative essay



Name: _____
Section : _____

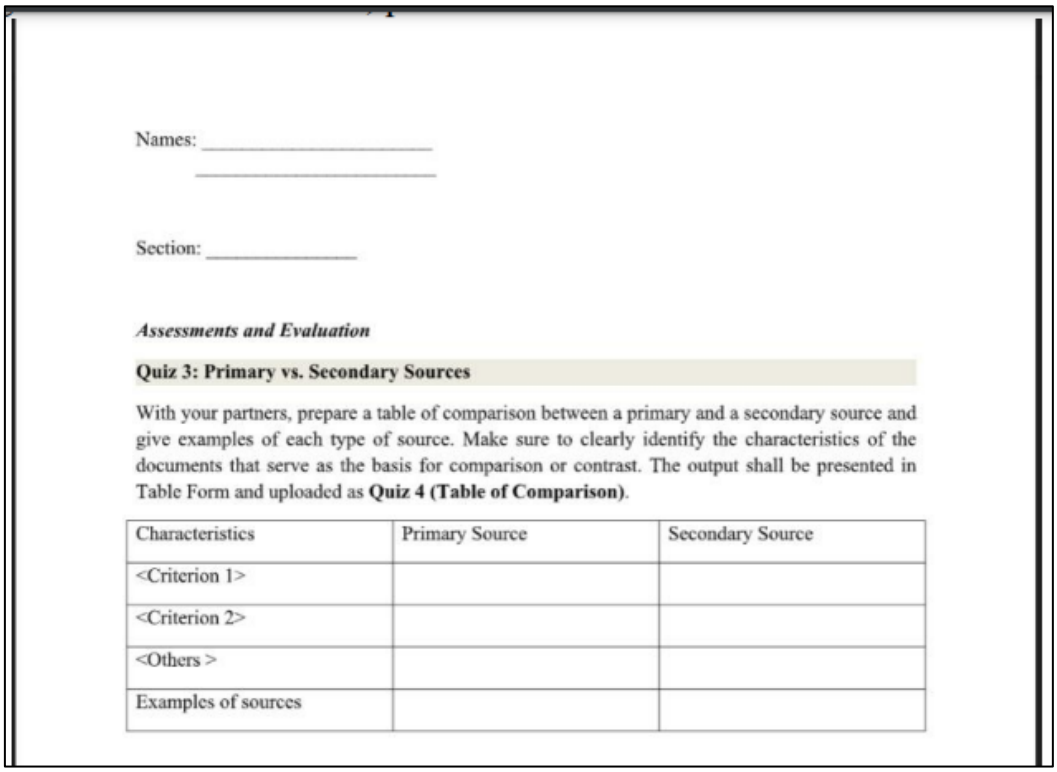
Quiz 4:
These graphs represent external and internal criticism. Explain the differences between external and internal criticism involving primary sources based on the pictures in not more than five sentences (5) each. Upload your work as **Quiz (Criticism)**

by: https://www.researchgate.net/figure/Internal-and-External-Criticism-from-Neuman-2003-p421_fig1_279943052

Answer: (In paragraph form)

Figure 4: Sample instructions in Google docs

Several methods of assessments were used in the module. Step 6- Eliciting performance (Responding) was demonstrated through the use of individual, pair-work, triads, group, and class activities to apply learning shown below in Figure 5.



Names: _____
_____

Section: _____

Assessments and Evaluation

Quiz 3: Primary vs. Secondary Sources

With your partners, prepare a table of comparison between a primary and a secondary source and give examples of each type of source. Make sure to clearly identify the characteristics of the documents that serve as the basis for comparison or contrast. The output shall be presented in Table Form and uploaded as **Quiz 4 (Table of Comparison)**.

Characteristics	Primary Source	Secondary Source
<Criterion 1>		
<Criterion 2>		
<Others >		
Examples of sources		

Figure 5: Sample of Pair Work

Moreover, scaffolding course assessments with smaller formative assessments and assignments was utilized so that students can practice and receive feedback before their major individual assessments.

Feedback is important because it allows students to maximize their potential by affording them a chance to be aware of their strengths and weaknesses, allowing them to identify actions to be taken to improve their performance. Step 7- Providing feedback (Reinforcement) was done after each graded assessment. For instance, all individual essays were marked and returned with written feedback from the instructor. Sample comments provided by the instructor are as follows:

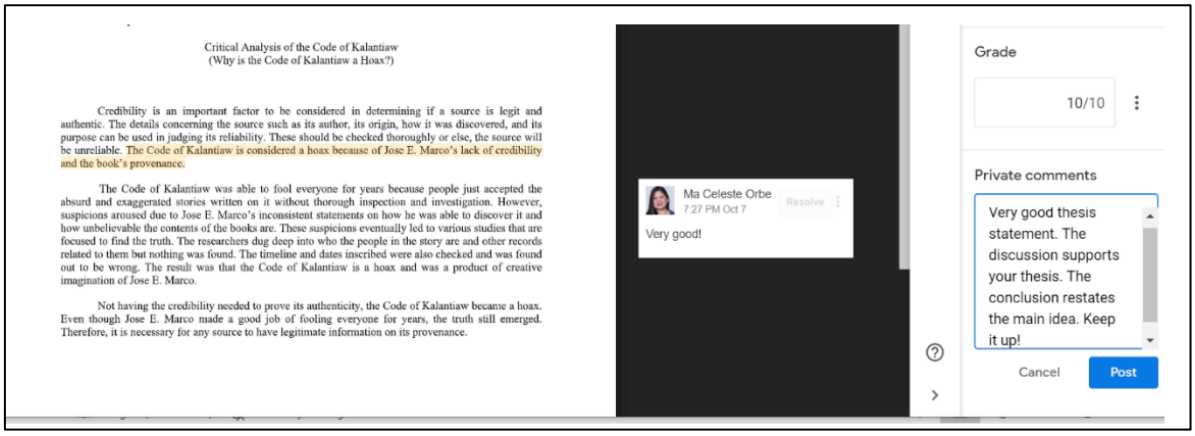


Figure 6: Sample feedback from Google Classroom

In the module, there is documentation of the use of a variety of assessment methods: annotated bibliography, historical analysis, recorded individual persuasive speeches; video presentation; argumentative essays; and a cultural dance presentation. Step 8- Assessing performance (Retrieval) was illustrated in different ways.

For the final step, Step 9- Enhancing retention and transfer (Generalization) was demonstrated in the module by ending lessons with reflection questions, as shown in Figure 7:

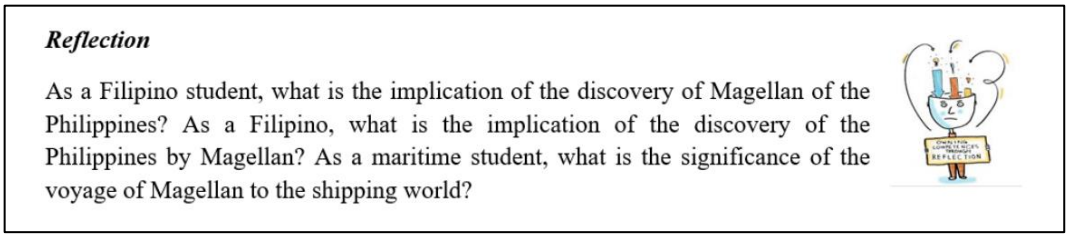


Figure 7: Sample reflection question

Gagne's nine events of instructions were followed in the preparation of the module. Each step is illustrated in different activities and strategies which contributed to the completeness of the module.

3. What were the qualitative comments of the peer evaluators on the development of the module?

Peer-evaluation is part of the module validation. For this module, three peer evaluators were assigned. Revisions made to the module were based on the comments of the evaluators. Thematic analysis was made to analyze the comments of the evaluators. The first topic focused on the contents and development of the module and the second topic are the suggestions for revisions.

As regards the module, its contents and development, the following comments were indicated in the evaluation sheets.

> *Every topic is very interesting.* (Eval 1)
>
> *The assessments are aligning (sic) in the course learning outcome.* (Eval 1)
>
> *This module is excellent and clear in teaching (sic).* (Eval 1)
>
> *The material is interesting and clearly structured.* (Eval 1)
>
> *It takes (students/you) through the material in a logical order so it's easier to grasp.* (Eval 1)
>
> *It provides with first-hand information to enhance the student experience.* (Eval 1)
>
> *I am amazed with the output of your Module because it is really design for the first semester. The activity is ready for the google classroom. The author already stated using google classroom*. (Eval 2)
>
> *All guidelines are well followed and organized.* (Eval 2)
> *The course itself is "Readings in the Philippine History" that is why the module has many reading activities (related to history), I really congratulate the author in establishing high cohesion regarding the topics. She was able to connect the topics as a whole and focused clearly on the objectives.* (Eval 2)
>
> *Your Module is very specific. It contains the necessary information for students to cope up (sic) with the subject.* (Eval 2)

With regards to the areas for improvement, the following suggestions were noted in the revised module:

> *Involve students in the design and refinement of evaluation tools, questions and processes, to enhance relevance and response rates* (Eval 1)
>
> *I suggest, if is it ok to put a practice/exercises/formative assessment related to maritime profession if necessary since we are here in the world of maritime education* (Eval 1)
>
> *Is it possible to reflect the points of the quizzes, tasks, activities, etc. in the module? There are many task (from the activity, exercises, watch video, additional readings assignment, quizzes) in the entire module. Is it possible to lessen with reference to the nature of the task, time, reading comprehension, writing capability of our cadets, no. of subjects they have?* (Eval 3)

In general, the contents of the module were rated outstanding by the evaluators. Points for revisions focused on refinement of assessment tools, which was addressed in the final revisions.

4. What were the quantitative and qualitative evaluation of the students of the course after using the module?

The final question focused on the students' evaluation of the module as it was used in the course. The indicators used in the evaluation instrument consisted of classroom activities addressing

content, classroom strategies and behaviors enacted on spot, classroom strategies and behaviors routinely carried out, classroom environment and technology, and classroom management and administration. Of the five indicators, the scores for content, and use of technology is emphasized as it is related to module preparation. Other indicators focused more on lesson delivery by the teacher. Based on the quantitative evaluation of 110 students who have taken the course, with 5.0 as the highest and 1 as the lowest, the following results were gathered.

Table 3. Quantitative Evaluation of the Students

Evaluation Areas	Mean
Classroom Strategies and Behaviors Addressing Content	4.75
Classroom Strategies and Behaviors Enacted on Spot	4.68
Classroom Strategies and Behaviors Routinely Carried Out	4.69
Classroom Environment and Technology	4.71
Classroom Management/Administration	4.73

The evaluation is based on a (5) point Likert Scale which is interpreted as follows: 4.50 - 5.00 Outstanding; 4.00 - 4.49 Satisfactory; 3.50 - 3.99 Needs Improvement; 3.00 - 3.49 Poor; and 1.00 - 2.99 Very Poor. Using this scale, the evaluation for the course content is 4.75 or outstanding and the evaluation for integration of technology in the classroom is 4.71, which is also outstanding.

The qualitative comments of the students after the conduct of the course were also gathered and then categorized into two themes: teacher qualities, strategies and methods, and content-related issues. The students commented on the teacher qualities related to teaching. Some comments pertained to personal qualities such as:

1- Excellent in teaching and very understanding.
2-She discussed this topic, very briefly but concise which is very convenient with us, and easier for us to learn using her wide knowledge about the topic.
3- The instructor presents well.
6- The instructor is very approachable and effective teacher for us.
7- This instructor is really fluent in English language.
9- The instructor helped us to fully understand the history course which is significant to us students. She showed enthusiasm and very approachable.
10- She is very good and kind teacher.
14-Very Bubbly and cheerful in teaching that influences students to engage more in the activities
16-She is an excellent instructor that possesses the knowledge that is why she can teach the course well.
17- She is a good instructor; she has a full consideration to us and she also used some kind of styles in teaching to understand the lesson easily.
18- She is an excellent instructor;

For teacher strategies and methods, the students' comments were:
4- Uses games and other ways to gain the students interest about the topic.
5- Always give us time to study and allow us to do more research about the course for better understanding.
8- There are more activities for more learning.
11- The instructor who explores the new materials and methods available for her to use and to teach her students is very well appreciated.
12- She demonstrates an instructor who is also open to new learnings, for she incorporates new methods and techniques in her teachings that would make her class more fun (like quizzizz.com).
13- Her method of teaching is effective.

18- She is an excellent instructor; she always finds new ways of teaching like game type of quiz which encourages students to learn more.
12- The instructor gives us enough time to prepare for activities.
15- The instructor gave us different videos to supplement our learning in this course.
19- Though she has many compliances, we are able to comply and learned all the things about the Philippine History.
20- Very resourceful in having video representation for our activities and lessons. Had enough related readings for our activities.

The qualitative comments about teacher qualities were included in the study because it is believed that these qualities related to the quality of teacher preparations carried out in the instructional design process. In sum, the quantitative and qualitative evaluations of the module showed an outstanding rating.

4. Discussions

As explicitly stated by the Commission of Higher Education (CHED), the institutions may use the Sample Syllabi in courses as a guide in the development of their own courses. Thus, the difference in the number of topics is justifiable in consideration of the school's program of study. For instance, taxation may not be important to the maritime students because seagoing professionals are tax-exempt. The inclusion of Martial Law and the evolution of the Philippine Constitutions as special topics is beneficial to maritime students because it helps build a general understanding about the country's labor and employment policies.

Guided by Gagne's Nine Events in Instructions, module writers are provided a simple guideline on the necessary steps and tasks to do in order to develop a complete module. For example, module writers can use media relevant to the topic to gain attention (Step 1). A presentation or briefing about the learning objectives may be used to describe the goal (Step 2). A review of the past lesson or topics discussed may be conducted to connect them to the material to be addressed in the current lesson (Step 3). Readings, presentations, demonstrations, multimedia, graphics, audio files, and animations, etc. may be used to present the materials to be learned (Step 4). Discussions are conducted to enable the students to actively reflect on new information in order to check their knowledge and understanding of content (Step 5). Activity-based learning such as group research projects, discussion, homework, etc. are given to elicit performance (Step 6). Immediate, specific, and constructive feedback are given to students (Step 7). Assessment activity such as a quiz, research project, oral presentation, essay, debates are given (Step 8). Additional guided practice or projects that might relate learning to other real-life activities are provided (Step 9). These steps, tasks, and activities are manifested in the module. These steps were illustrated by various activities and strategies in the module.

5. Conclusions

The objective of this research is to gain insights on the application of Gagne's nine events of instructions to guide the module preparation. Based on the findings of this study the following conclusions are made:

4. The module developed for a social course covered the major topics prescribed for maritime higher educational institutions.
5. The module is written following the nine events of Gagne's instructional model.

6. The module is acceptable to both peer evaluators and points of revisions were addressed by the author.
7. The module is rated as outstanding by the students.

6. Recommendations

In the light of the findings, the following recommendations are made:

1. Due to the satisfactory evaluation of the Module in NGEC 2- Readings in Philippine History, said module is recommended as the instructional guide in the course. Activities and formative assessments may be revised or adjusted to provide differentiation.
2. Training in module preparation using Gagne's instructional model should be conducted regularly as part of the institution's professional development program.
3. A policy guidance may be issued to provide the standards in writing style and related mechanics to be followed in module preparation such as length of videos, number of required readings, grading rubrics, number of required assessments, etc.

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Evaluation of Maritime Literature Module: Using Google Classroom as an Online Teaching and Learning Platform

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The study is an action research project that focuses on improving a learning resource for modular learning. The purpose of this study was to assess the use of a module in a Maritime Literature course that was delivered during two consecutive academic terms. Convenient sampling was utilized to collect responses from Bachelor of Science in Marine Transportation (BSMT) and Bachelor of Science in Marine Engineering (BSMarE) students. The academic year covered by the study was 2020-2021. Data were gathered from respondents using a survey questionnaire administered via an online platform. Findings revealed that course content alignment and time frame are critical aspects to consider when developing a learning material, particularly for an online class utilizing Google Classroom. It should be mentioned that different maritime-related activities aid in learner comprehension and teacher execution of the course. Indeed, the overall usage of the Maritime Literature Module was remarked "good" prior and after the revisions. The modifications were all based on input from both teachers (verbal feedback) and, most importantly, students (written and evaluated). The study's pedagogical implications show that creating a learning resource like a module necessitates content alignment, which is a critical component in the material's efficacy. Accordingly, it is critical to establish clear, attainable goals or outcomes for the module, as well as course monitoring to give required modifications to the material.

KEYWORDS: *Online class, Modular learning, Learning material, New normal*

1. Introduction

Background of the Study. As the Philippines continues to grapple with the coronavirus epidemic, questions over whether schools should remain open and children should attend classes have exacerbated the problem. Meanwhile, several educational sectors have sought answers to the current situation. One of these is the use of modular learning, which is an alternative to regular face-to-face sessions for reducing the danger of getting exposed to the fatal virus.

According to a Department Education's (DepEd) poll issued on July 30, 2020, modular learning is the most desired method of remote learning by parents for the next school year. The agency said that its survey of parents about their preferred alternative learning mode revealed that among different learning materials, they need to provide an approximately 8.8 million printed modules. With such requirements and conditions, the Department of Education believes that continuing education is impracticable.

Consequently, last August 14, DepEd postponed the class opening for the school year 2020-2021 from August 24 to October 5, 2020, pursuant to Republic Act No. 11480.

Meanwhile, as an academy with a separate educational system, Maritime Academy of Asia and the Pacific (MAAP) has continued to assure the delivery of safe, accessible, and excellent education to all students within the academy. Starting July 1st to July 31st, 2020, nine (9) different sections of the Regular Class of Batch 2022 enrolled in the Maritime Literature course through the BSMT program. This is one of the program's elective courses. The class has a total enrollment of 154 students.

Over the course of one month, teachers and students in the aforementioned summer program used the Maritime Literature Module with the help of the Google Classroom Application as an online platform.

Thus, the current study evaluated the designed and developed Modular learning material for the Maritime Literature Module using Google Classroom as an Online Teaching and Learning Platform.

Statement of the Problem. The general problem of the study is: Evaluate the Maritime Literature Module with the aid of the Google Classroom as an Online Teaching and Learning Platform.

Specifically, this study seeks to answer the following questions: (1) How may the module's content be described in terms of the: (1.1) student's level of knowledge - before the lesson, after the lesson; (1.2) student's level of effort put into the lessons; (1.3) student's understanding the learning outcomes of the lessons; (1.4) time spent to cover the content of the lessons; (1.5) new and updated information from the lessons; (1.6) alignment of learning outcomes to the assessments; (1.7) connection of activities to the learning outcomes; and (1.8) activities promotion of life-long experience learning? (2) What topic/s from the module do cadets consider most interesting and most difficult? (3) What is the over-all evaluation of MAAP Deck cadets on Maritime Literature's Module?

Objectives. This study aimed to: (1) identify the strengths and weaknesses of the Maritime Literature's Module, and (2) evaluate the overall content of the Maritime Literature's Module.

Literature Review and Framework. Learning modules are written or non-printed resources that lead both teachers and students through the content and learning activities of a subject area, such as text or video modules. A Learning Module is a tool that organizes course materials in a logical,

sequential sequence, moving students through curriculum and exams in the order indicated by the teacher.

Therefore, a module ties the needed information together, emphasizing to students the goals they achieved and what they have learned. Designing and developing a learning material-like module must consider the kind, frequency, and sequence of numerous components inside a certain unit of instruction.

Based on Boise State University (2020), a module is a unit, chapter, subject, or piece of education. It's a "self-contained" block of education that's part of typical unit or instructional segment. A week is a usual module duration, however, depending on the material and your teaching style, it might be shorter or longer.

Burge (2019) discusses three essential considerations when creating practical modules and courses. First, be clear about the module's goals and ambitions for students, and convey them to them. With this, it is also essential that the material promotes lifelong learning by enabling working professionals to master new skills in less time while continuing to work. Finally, students will be able to integrate their skills as they develop more skills along the way.

Accordingly, Bloom divides learning into degrees of sophistication, starting with surface learning abilities like knowledge recall and progressing to more profound learning skills like assessment and evaluation. It is related to Bloom's taxonomy, that is a hierarchical approach that divides learning objectives into stages of complexity ranging from basic information and understanding to advanced assessment and production. Bloom's Taxonomy categorizes learning into three types: cognitive, affective, and psychomotor.

Typical learning outcomes for a module might map onto Bloom's hierarchy, indicating the learning development throughout the module. Next, ensure your module is constructively aligned (the learner actively constructs their understanding, and all teaching and assessment are aligned with the intended outcomes). Finally, consider the course in context (department, institution, and sector)

Thereby, it aids educators in identifying the intellectual level at which a specific student can function. It also helps learners ask questions and build critical thinking skills by aiming for the top three levels of analysis, synthesis, and evaluation with students who are ready for those levels.

Meanwhile, according to the Glossary of Education Reform (2014), learning objectives are also a means to define and express academic standards for students, so they know what is expected of them. In a well-designed and constructed learning material, learning objectives must be communicated to students; the reasoning goes that students will be more likely to achieve the presented goals.

When we communicate the targets and goals in learning materials, the students will know what to do and what they need to bring to be engaged and successful. This will also make the class more accessible and efficient, allowing students to achieve more.

The University of Colorado | The Center for Faculty Development (2007) has defined alignment as the connection between learning objectives, learning activities and assessment. An aligned course means that your learning objectives, activities and assessments match up so students learn what you intend and accurately assess what students are learning.

Consequently, it is crucial to establish learning objectives wherein intended behavioral outcomes of students will be expected after a specific educational process. Moreso, assessment must obtain evidence or information about students' learning to determine whether students met the course's stated learning objectives.

The preceding literature highlights the need for a rigorous approach to developing and constructing learning materials such as modules.

Significance of the Study. MAAP Cadets may serve as an appropriate learning material in Maritime Literature Course to continue ensuring the delivery of safe, accessible, and high-quality education for all students within the academy.

MAAP Faculty members, the current study's findings may serve as the foundation for other maritime and non-maritime courses seeking guidelines and considerations for creating and developing a modular learning material that considers the learning material's strengths and limitations.

Department of Academics and Instructors, the study's outcomes may provide excellent teaching-learning assistance for both instructors and students. In addition, the suggested and improved learning resources may better meet the demands of instructors giving classroom instruction and students taking the Maritime Literature course.

2. Methods

Description of Participants involved. Starting July 01-31, 2020, nine (9) sections from the Regular Class of Batch 2022 under the BSMT program have taken the Maritime Literature course. As mentioned earlier, this is one of the electives for the curriculum offered during the summer period. The class has a total population of 154 students; however, only 119 responded to the survey.

Over one month, teachers and students in the summer mentioned above program used the Maritime Literature Module to utilize the Google Classroom Application as an online platform.

In the succeeding semester, specifically, the first semester of AY 2020-2021, ten (10) sections from the Regular Class of Batch 2022 under the BSMarE program have taken up the Maritime Literature course. The class comprises a total population of 175 students; however, only 106 responded to the survey.

Description of Action. The present study is action research focused on better understanding problematic social situations and improving them (Burns, 2005). This research also includes teaching and learning with practitioners, particularly teachers. Furthermore, planning techniques in response to difficulties with teaching materials are discussed.

Kemmis and McTaggart's (1988) action research paradigm was used to explain the many components of the study.

Accordingly, action research is a form of collective self-reflective inquiry undertaken by participants in social situations to improve the rationality and justice of their own social or educational practices, as well as their understanding of those practices and the situations in which the practices are carried out. (Kemmis and McTaggart 1988, p. 5)

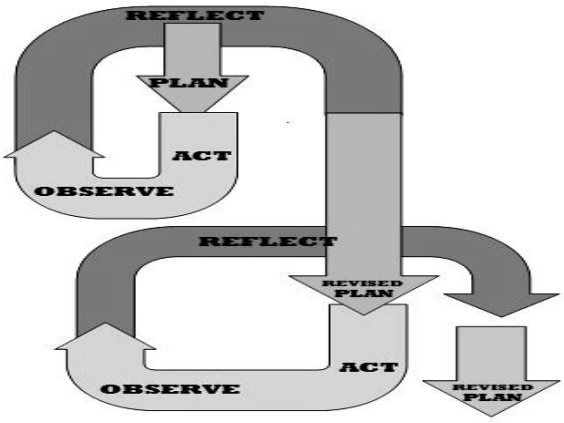

Figure 1. Kemmis and McTaggart's (1988) Action Research Model

It can be gleaned from Figure 1 that Kemmis and McTaggart's (1988) Action Research Model consists of four steps:

Plan**:** Understanding a problem and identifying potential strategies. With time limitations, the construction and development of instructional resources such as the Module in Maritime Literature have been exposed to future changes. This involves excluding some topics and formative activities (seat tasks and quizzes) to satisfy the course's time framework for the summer period.

Action: Executing the strategies. According to student and cadet feedback, covering the complete topics of the first designed Maritime Literature curriculum is ineffective. The number of texts, activities, assignments, and quizzes was not appropriately planned for the summer class session.

Thus, the following exclusions of the contents are made on the Maritime Literature module: (1) The number of activities was reduced from five to three. Activity 4 and Activity 5 were removed; (2) The number of assignments, from a total number of six activities, was reduced to four assignments. Assignment 5 and Assignment 6 were removed; (3) Readings of "The Old Man and the Sea by Ernest Hemingway" were removed, while "Sonnet 116 by William Shakespeare" was added; and (4) The following works were introduced because it was necessary to include maritime-related literature in the course: Sonnet 116 by William Shakespeare and The Adventures of Huckleberry Fin.

Observation: Noticing outcomes of the strategies. With the action taken, exclusion of some of the formative contents of the module yielded favorable outcomes in students' feedback.

Reflection: Evaluating the outcomes of the strategies. (1) The assessed comments of teachers and students who utilized the learning material on the course of Maritime literature provided essential improvements to the module, notably in eliminating parts of its content. (2) Evaluated feedback and modifications have made the module more successful in catering to both instructors' and students' teaching and learning requirements, taking into account the medium utilized in teaching – Google Classroom – and the period at the given moment.

The revised material for Maritime Literature was utilized in the succeeding semester, the first semester of 2020-2021.

Research Instrument. The tool for data collection was a survey questionnaire issued through Google Form to both BSMT and BSMarE cadets. The survey form included descriptive responses such as Good, Fair, and Poor to evaluate the Maritime Literature Module.

Data Collection and Analysis. Convenience sampling was utilized to collect responses from Google Form respondents. Descriptive statistics, such as frequencies and percentages, tabulated the responses.

3. Results

Table 1 provides the students' feedback on utilizing the Maritime Literature module throughout the summer class and the first semester of the academic year 2020-2021

Table 1. *Students' Feedback on the Usage Maritime Literature Module During the Summer Class and First Semester*

Contents' Descriptions	Remarks
1. student's level of knowledge before the lesson	Fair
2. student's level of knowledge after the lesson	Good
3. student's level of effort put into the lessons	Good
4. student's understanding of the learning outcomes of the lessons	Good
5. time spent to cover the content of the lessons	Good
6. new and updated information from the lessons	Good
7. alignment of assessments to the learning outcomes	Good
8. connection of activities to the learning outcomes	Good
9. activities promotion of life-long experience in learning	Good
10. the overall quality of the lessons	Good

The module comprises five (5) lessons, and the respondents described it in the following ways: 1. Level of knowledge before the class, 2. Level of effort you put into the lessons, 3. Level of knowledge at the end of the lessons, 4. Understanding the learning outcomes of the lessons, 5. The time spent is sufficient to cover the content of the lessons, 6. The lessons provided new and updated information, 7. The learning outcomes are aligned with the assessments, 8. The activities provided are connected to the learning outcomes, 9. The activities promote lifelong experiential learning, 10. The overall quality of the lessons and 11. The overall rating for the Maritime Literature Module.

The module was rated "excellent" by the majority of respondents, except for "student's level of understanding prior to the lesson," which was rated "fair."

Overall, the Maritime Literature Module was rated as "good" in terms of usability, considering the module's objective, alignment, and context. This is confirmed by Burge's (2019) study, which identified the three essential factors to consider when building practical modules and courses in context (department, institution, and sector).

Table 2.1. *Most Interesting and Most Difficult Topics on Maritime Literature during the Summer Class*

Lessons	Interesting Topics	Difficult Topic
1. Introduction to Literature	Forms of Literature	Approach of Criticism
2. Types of Literature	Divisions of Literature	Smooth Between Sea and Land by A.E. Houston
3. Critical Approaches of Literature	Formalist Criticism	Deconstructionist Criticism
4. Content and Contextual Analysis	Using Contextual Analysis to Evaluate Text	Using Contextual Analysis to Evaluate Text
5. Presenting Evidence in Literature	Evidence in Literature Function of Evidence	Function of Evidence

It can be seen in Table 2.1 the different topics per lesson in the Maritime Literature course. In Lesson 1, students considered Forms of Literature the most interesting while the Approach of Criticism

the most difficult topic. In Lesson 2, students considered Divisions of Literature the most interesting topic while Smooth Between Sea and Land by A.E. Houston is the most difficult. Next, in Lesson 3, students considered Formalist Criticism the most interesting topic while Deconstructionist Criticism the most difficult topic. In Lesson 4, the topic Using Contextual Analysis to Evaluate Text was considered the most interesting and difficult topic. Lastly, in Lesson 5, students considered Significance of Evidence in Literature Function of Evidence as the most interesting topic while Function of Evidence as the most difficult topic.

Table 2.2. *Most Interesting and Most Difficult Topics on Maritime Literature during the First Semester*

Lessons	Interesting Topics	Difficult Topic
1. Introduction to Literature	Seven Reasons Why Literature	None
2. Types of Literature	Divisions of Literature	Smooth Between Sea and Land by A.E. Houston
3. Critical Approaches of Literature	Formalist Criticism	Deconstructionist Criticism
4. Content and Contextual Analysis	Captain Courageous	Using Contextual Analysis to Evaluate Text
5. Presenting Evidence in Literature	Significance of Evidence in Literature	How Do You Find Evidence

As presented in Table 2.2 are the different topics per lesson in Maritime Literature course. In Lesson 1, students considered Seven Reasons Why Literature is So Important as the most interesting while there was no difficult topic for the students. In Lesson 2, students considered Divisions of Literature as the most interesting topic, while Smooth Between Sea and Land by A.E. Houston is the most interesting. Next, in Lesson 3, students considered Formalist Criticism the most interesting topic while Deconstructionist Criticism the most difficult topic. In Lesson 4, Captain Courageous was considered the most interesting, while Using Contextual Analysis to Evaluate Text was the most difficult topic. Lastly, in Lesson 5, students considered Significance of Evidence in Literature the most interesting topic while How Do You Find Evidence as the most difficult topic.

Table 3. *Overall Evaluation of the Students on Maritime Literature Module*

Semester Offered AY 2020-2021	Student's Program	Students Evaluation
Summer Class	BMST	Good
First Semester	BSMarE	Good

Table 3 reveals students' overall evaluation of using Maritime Literature Module. As shown in the table, students rated the module as good in all categories, including content, alignment, and purpose of the learning material, over the summer and first semester. This was supported by Burge (2019) being clear about the module purposes and aspirations for student participants and communicating these to students.

4. Discussion

Reflections/Implications. The following implications were observed in the conduct of the study.

1. Designing a learning material like a module requires alignment of the content, which is a vital factor in the effectiveness of the material.

2. It is crucial to have clear, achievable goals or outcomes for the module. This may also be supported by related formative activities that help students fill the gap in achieving the intended course outcome.
3. Because of the current scenario, modular learning is the most desired method of distant learning; nevertheless, time constraints must also be addressed. This also covers the number of outputs provided to students. Time must allow learners to complete assigned activities without sacrificing their quality.

5. Conclusions and Recommendations

Conclusions. In light of the previous findings, the following conclusions were hereby drawn:

1. Students' feedback on the usage maritime literature module during the summer class (before the revision) and first semester (after the revision) were both positive that revealed a rating of "good."
2. The most interesting and most difficult topics on maritime literature during the summer class and first semester appeared to be the same topics except for Lessons 4 and 5 in the first semester.
3. Students' overall evaluation of the Maritime Literature module's usage was good.

Recommended Action Plan. In view of the conclusions made, the following measures were recommended:

1. Course developers and designers must consider the alignment between learning objectives, learning activities and assessment. The learning material must have learning objectives, activities and assessments that match up so students learn what they intend, and instructors may accurately assess what students are learning.
2. Topics covered in the course-learning material must also address the students' prior knowledge upon taking the course. Thus, a variation on related topics may also be offered following a given time frame. Doing so may serve the real purpose of the learning material while achieving the expected learning outcome from the students at the same.
3. Monitor the user's (students/instructors) feedback of the learning materials allows necessary revisions on the improvement of the module.

6. Acknowledgments

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Above all, to the ALMIGHTY GOD, Praise ye the LORD. O give thanks unto the LORD; for he is good: for his mercy endureth forever.

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Enhancing Competence in Tank Sounding among MAAP Deck Cadets through Instructional Innovation and Development

***Research Priority Area*: Maritime Education - Innovations in Maritime Education**

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ABSTRACT

This study documents the development and evaluation of instructional materials to enhance the competence of deck cadets in taking accurate tank sounding measures. These educational aids include fabrication and installation of tank sounding pipes, preparation of video presentation, and manual that educates and trains the student in tank sounding, one of the vital tasks of deck cadets and officers on board vessels. Enhancing the competence of the students in this area helps accomplish BSMT program outcomes and ultimately produces global maritime professionals. This developmental research focuses on improving instruction with the use of instructional tools – sounding pipes, video presentation, and manual with calibration tables. The researchers adopted the ADDIE model in developing the manual. This study utilized both qualitative and quantitative approaches in the different areas of instructional development. The feedback of the Seamanship 5 students and faculty members were analyzed for further improvement. A descriptive research approach was used to analyze the data obtained from the survey questionnaires. Survey results indicated a positive evaluation of the tank sounding pipes and video presentation and manual by the instructors and students involved in the study.

KEYWORDS: ***Manual Evaluation, Seamanship, Knowledge and Understanding, Instructional Tools***

1. Introduction

Life and career skills are 21st-century skills needed for graduates to lead better lives (Rafiq, et al. (2019). Graduates, as part of human capital for the success of nations, need life skills to deal with problems in positive ways and career skills for them to thrive in the complex and changing workplace. Life and career skills involve flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility (International Bureau of Learning, n.d.). The need for these skills is even more magnified with the current pandemic situation that the world is facing.

Correspondingly, even before the onset of the COVID-19 pandemic, the International Maritime Universities Association (IAMU) has published a body of knowledge that consists of knowledge, skills and attitudes (KSAs) that are required of global maritime professionals, of which HEIs are wise to espouse. A global maritime professional, according to IAMU, is equipped with all the relevant technical competencies pertinent to their specific operational role in the industry and as required by international requirements, with high-level academic skills including logical and critical thinking; high level of professionalism and ethical behavior, human relations skills, emotional intelligence and multicultural/ diversity awareness and sensitivity; leadership skill and ability to optimally work with teams and take personal initiative; high sense of environmental consciousness and the need for sustainable practices; and an excellent grasp of contemporary issues affecting the maritime industry. (IAMU, 2019).

One of the critical issues addressed by having competent global maritime professionals on board vessels is safety. The maritime industry recognizes that safety culture is relevant even with the sophisticated equipment and facilities that modern vessels have today.

Moreover, stability is a crucial factor in ensuring ship safety. Ship stability enables ships to float in an upright position and, if inclined by an external force, to return to this position after the external force has ceased acting. Therefore, understanding ship stability is critical for maritime students or professionals (Barras and Derrett, 2006).

This research deals with knowledge and skills in tank sounding. Sounding measures the amount of fluids in the ship tanks. Aboard ship, it is critical to have an updated record of the quantity of liquids (in all forms) loaded in various tanks. A ship is provided with automatic sounding measuring systems which can check the level of liquids remotely or locally without manual calculations. However, as part of the safety culture on board, officers/crew cannot entirely depend on automation and mechanical devices, especially when it comes to dangerous substances, for which negligence can cause oil pollution, machinery damage, and even the life of the crew themselves. They usually conduct manual sounding to recheck the level of the fluid in the tanks and ensure that the tanks will not overflow or run dry in any case.

Considering the usefulness of tank sounding in the safety of life and cargo on board, knowledge and skills in this area are paramount. Bhattacharjee (2019) mentioned that taking tank sounding is one (1) of the ten essential jobs a deck cadet has to perform on board ships. This task is a great responsibility since the stability of the ship depends on the total ballast being carried; hence, a cadet must learn how to take sounding swiftly and accurately. Wankhede (2019) also confirms that sounding values affect the stability of the ship, voyage planning, cargo planning, and assessing leakage or loss.

The tank sounding is part of the Seamanship 5 -Ship Handling and Maneuvering Course in the Academy, particularly TLO2 ELO 2.4: 10.1. However, the student research by Aguilar, Mayo and Sta.

Cruz (2019) has shown that cadets could not practically demonstrate taking correct tank-sounding reading because of the lack of tank sounding equipment for simulations and tank calibration tables for practical training purposes. Competencies in this area were only attained on the board training ship.

Objectives of the Study. This study primarily determined to produce instructional materials to enhance the competence of students in tank sounding. Specifically, the researchers aimed to (1) develop instructional materials - tank sounding pipes for simulation and practical training and tank sounding video presentation for instructional and demonstration purposes; (2) produce tank sounding manual that documents and guides students achieve competence in tank sounding; (3) evaluate the tank sounding pipes and video presentation as instructional materials, and; (4) present the development of the tank sounding manual using ADDIE model - Analyze, Design, Develop, Implement, and Evaluate.

Literature Review. Enhancing the technical competencies, among other skills, of maritime students is a necessary step toward producing global maritime professional by maritime higher education and training institutions (METIs) (IAMU, 2019). This study focused on tank sounding, a technical skill needed by deck cadets and officers onboard vessels.

Importance of tank sounding skills. Cicek, Akyuz, and Celik (2019) identified technical competencies for future skills–Operations Monitoring and Analyzing, Equipment Operation and Control, Equipment Maintenance and Repair, Troubleshooting, Information and Data Processing, and Programming. Tank sounding can be considered as an operations monitoring and analyzing competency skill.

Wankhede (2022) stressed that tank sounding is essential as four (4) ship operations depend on it–ship stability, voyage planning, cargo planning, and assessment of leakage/loss. Therefore, officers conduct manual sounding to monitor tanks and ensure safety and avoidance of oil pollution and machinery damage.

Relevant Principles and Theories. The researchers utilized principles derived from various educational theories in developing the tank sounding instructional materials. Learning is a process that ties personal and environmental experiences and influences to acquire, enrich or modify one's knowledge, skills, values, attitudes, behavior and world views. (International Bureau of Learning, n.d.)

One of the learning theories adopted by the researchers is experiential learning theory, which stresses that learning happens when students experience it by applying knowledge in real-world situations. This theory postulates that learning is self-initiated; people are naturally inclined to learn by full involvement in the learning process. (International Bureau of Learning, n.d.; Fairbanks, 2021)

Furthermore, the study adopted the instructional design theory to develop the tank sounding manual. According to Smith (1998), instructional design theory deals with the best design instruction to maximize learning. The well-known ADDIE model was utilized to guide the researchers develop the said manual. ADDIE stands for the five stages of the material development: A for Analyzing potential learner characteristics and defining what is to be learned or goal-setting, D for Designing how learning should be done, D for Developing the instructional materials, I for Implementing or trying out the produced instructional materials, and E for Evaluating the effectiveness and efficiency of the materials (McGriff, 2000; Culatta, 2022; Abernathy, 2019; Kurth, 2018).

ADDIE model is applied in various areas of educational development. Abernathy (2019) reported that the ADDIE model was used to guide university leaders, instructors and course designers

in aligning online courses for a Master's degree program in education. Culatta (2022) also stated that this model was used by instructional designers and training developers, though its weaknesses led others to develop variations of it. This model was applied in the e-learning environment and was found to be effective in teaching creative writing (Almelhi, 2021). Also, Suryanda et al. (2019) utilized the ADDIE model in developing a smartphone-based laboratory manual as learning media for biology learning. ADDIE model was also used to develop and validate the procedure of Actuarial Mathematics learning (Susiana, 2019)

Development of Course Manual. Over the past years, the development and validation of course manuals or instructional materials have been carried out to provide guidance for teachers and students. However, such materials are limited in the maritime education and training sector. The researchers have not found similar research on tank sounding manual development and validation and only a handful on maritime topics. Hence, most of the comparable studies presented are in other fields of study. Nevertheless, the researchers obtained similar principles and concepts for the paper at hand.

Roman (2016) developed and validated a statistical module for student-researchers of Laguna State Polytechnic University, and obtained very satisfactory feedback on the objectives, content, language used, and evaluation activities of the module. Similarly, Torrefranca (2017) developed and validated instructional modules on rational expressions and variations, which was deemed strongly satisfactory by the evaluators.

Conceptual Framework. Figure 1 portrays the paradigm of the study which adopted the design research approach in educational technology by Thomas Reeves (2006). Also, the researchers considered concepts of developmental research methods shared by Richey and Klein (2005).

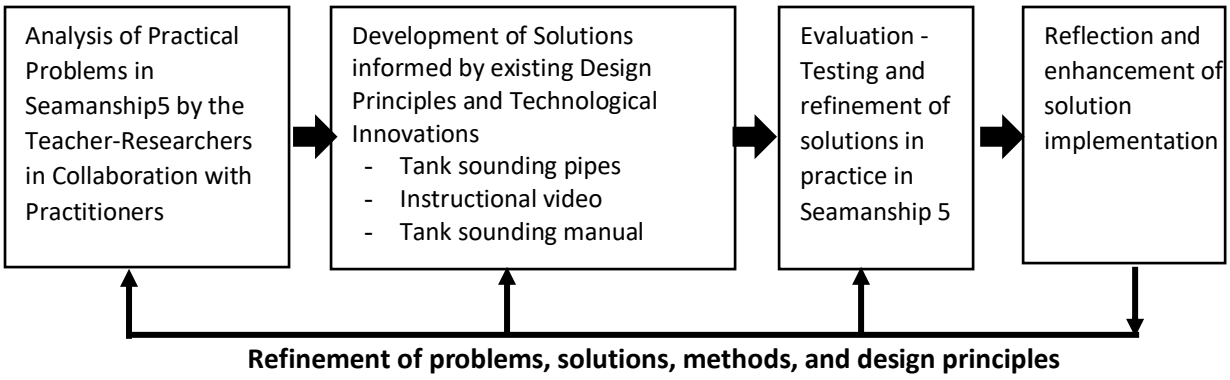

Figure 1. Paradigm of the study

The research started off with the analysis of the practical problems encountered by the teacher-researchers in the teaching of Seamanship 5, particularly on the competence of students in tank sounding. Concerns were discussed with deck officers within the academic unit. After analysis and collaboration, the teacher-researchers developed solutions to existing issues on the competence of students in tank sounding. The solutions developed were fabrication and installation of tank sounding pipes, instructional video, and tank sounding manual. These solutions were tested and refined for the teaching-learning practice in Seamanship 5. After evaluation, results were used to reflect and enhance the solutions made to better improve teaching-learning of tank sounding. Throughout these processes, problems, solutions, methods, and design principles are analyzed and refined for improvement of instruction and competence of students.

Significance of the Study. This study hopes to contribute to essential research area on instructional material development. The developed instructional tank sounding pipes, video presentation, and manual help students and instructors have an enhanced teaching-learning experience. With the practical application of the research, MAAP's quest for continual improvement towards excellence in maritime education and training is enhanced. Consequently, MAAP contributes to the development of maritime education and training for a better maritime industry. The research may also help other course developers or instructors develop other manuals in their fields of specialization.

8. Methods

The study utilized developmental research in dealing with the design and development, evaluation and validation of instructional tools, particularly the tank sounding pipes, video presentation, and manual on tank sounding. The development model used was ADDIE (Analyze, Design, Development, Implement, and Evaluate), which was adapted as applicable in the local setting of the study.

The researchers utilized different research methodologies in the different phases of the study. They obtained secondary resources such as guidelines, reports, and previous studies at the initial stage of the manual development and as they progress through the different phases of producing the manual. In the Analysis and Development phases, qualitative and quantitative methods were used - documentary analysis of secondary data and informal interviews. In the Evaluation and validation phases, descriptive and numerical data were analyzed.

The participants of this study include four expert reviewers from the deck and engine departments, two deck instructors teaching Seamanship 5 and selected 50 Bachelor of Science in Marine Transportation (BSMT) students who took the Seamanship 5 course during the second semester of AY2020-2021 and second semester of AY2021-2022.

They utilized the F-027 Questionnaire on the Relevance, Usability and Further Improvement of Developed Instructional Materials of the Academic Research Unit (ARU) for the tank sounding pipes and video presentation. This questionnaire obtained a Cronbach Alpha reliability of 0.92, suggesting a high internal consistency. Also, they adapted a 90-item researcher-made questionnaire on manual evaluation for the experts and students to assess the objectives, format, content, organization, language, and usability of the tank sounding manual. This questionnaire obtained a Cronbach Alpha of 0.97, also indicating high internal consistency of the items. These research tools were translated into Google forms for easy distribution to the respondents who are restricted in the Academy due to COVID-19 health protocols.

Numerical data were analyzed using the IBM SPSS 25 software. Statistical tools such as mean, standard deviation, and *t*-test were utilized to describe the data obtained. Since SPSS was employed, the probability values (*p*-values) of significance level of the *t*-test were readily compared with 0.05 level of significance which was set by the researchers before conducting the study. If the *p*-value is less than or equal to 0.05, the relationship is significant and therefore the null hypothesis is rejected. Otherwise, it is not rejected.

9. Results

This Results section presents the findings relevant to the objectives/questions.

Development of the Tank Sounding Pipes. After considering the student research findings of Aguilar, Mayo, Sta. Cruz (2019) on the lack of facilities for tank sounding, the researchers, with the deck program head and function head, reviewed the existing laboratory equipment or facility for the topic and considered the skill needed in tank sounding operation on board. Their analysis led them to propose improvised materials for teaching and practical demonstration of knowledge and skills on the topic. Hence, water ballast pipes were fabricated and installed at the Madrigal Building for practical trainings. The numbers of sounding pipes and tank table information related was based on the model ship MV Pepetone, which is being use for the delivery of Seam 2A/2B Trim and Stability. These tank sounding pipes help cadets gain knowledge, understanding, and skills that will prepare them for their work onboard ship.

The procedure and materials used were:

1) Fabricate angular bar into a ship shape form to serve as the holder of the rings where the sounding pipes will be in place. (2 pieces; 215x46cm)
2) Fabricate Rings to be welded, which serve as holders of the sounding pipes. (Galvanized pipe with approx. 2 inches diameter) to be welded 30 cm apart within the frame.
3) G.I. pipes of 2" diameter gauge/schedule 20, treaded at both ends. (14 nos.)
4) Coupling (cover) for the treaded pipe parts (subject for modification to fit its uses on both ends 28 nos.)

a) The ship shape angular bar and rings assembly (*upper part*) supported by a bracket that is welded in parts at the beam of the building.

b) The ship shape angular bar and rings assembly *(lower part)* supported by a wood or steel assembly platform and serve as the base.

c) The sounding pipes in place within the welded ring only at the ship shape angular bar fabricated assembly (removable type)

d) Top end of the pipe is covered by easy to remove cup type coupling/cover.
Lower end of the pipe is covered by cup type coupling subject to remove only in case of any sounding tape trap or broken inside the pipe line.

e) The lower part of the pipe is equipped with **drain design system** (nuts and bolts) in order to simulate different water soundings levels for training purposes in part of course outcome requirement criterion.

The procedures were carried out by the lead researcher in consultation and assistance of machine shop and VTC personnel.

Development of the tank sounding video presentation. The lead author produced a tank sounding video presentation as a vital resource in support of classroom instruction. After preparing the plan, concept, script, and materials needed, he solicited the assistance of his initial students to prepare a video presentation as a learning resource. This instructional medium is very useful for auditory and visual learners as video stimulates interest and encourages them to engage in the learning process.

Evaluation of the tank sounding pipes and video presentation as instructional materials. The tank sounding pipes and video to further enhance teaching and learning were evaluated by the students. The evaluation result is shown in Table 1.

As depicted in Table 1, the tools, on average, were excellent, as suggested by the high mean ratings (close to 5, which is the highest possible rating) and the overall mean of 4.89 with a standard deviation of 0.18. They provided the highest mean rating (M=4.92, SD=0.15) on the appropriateness or fitness for the purpose of the tank sounding video; followed by relevance to the discipline and efficiency. The lowest mean of 4.86 (SD=0.25) was on satisfaction.

Table 1. Evaluation of the Tank Sounding Video as an Instructional Material

Evaluation Areas	Mean	Std. Deviation	Remarks
Appropriateness/Fitness for Purpose	4.92	0.15	Excellent
Relevance to Discipline	4.90	0.21	Excellent
Effectiveness	4.88	0.22	Excellent
Efficiency	4.90	0.21	Excellent
Satisfaction	4.86	0.25	Excellent
Overall	4.89	0.18	Excellent

Development of the tank sounding manual. The tank sound manual was prepared considering the ADDIE model as shown in Figure 2.

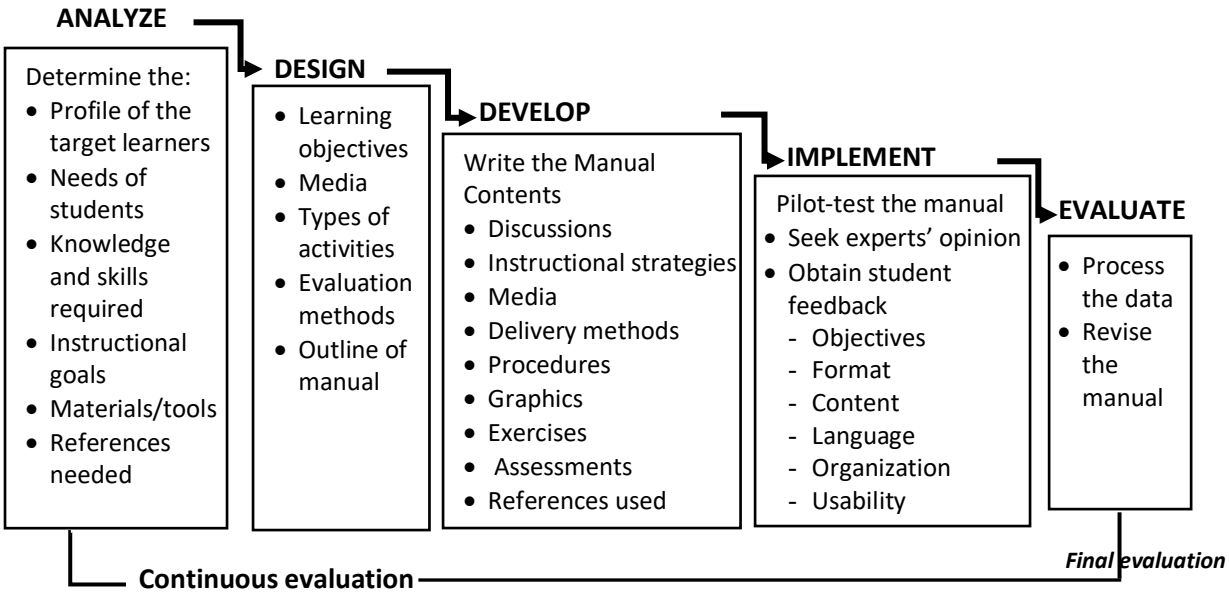

Figure 2. Development of the tank sounding manual

Analyze. The first stage, involved determining the profile and needs of the target learners: The BSMT students who were preparing for their shipboard training in their third or fourth year. Since they are about to work on board ships, they should be equipped with basic seamanship and navigation knowledge and skills, including getting accurate tank sounding.

Tank sounding is taken in the Seamanship 5 Course (Ship Handling Maneuvering). Hence, the target students were assumed to have basic skills in seamanship as they have completed basic related courses such as Ship, Ship Routines and Ship Construction (Seam 1), Trim, Stability and Stress (Seam 2), Cargo Handling and Stowage (Non-Dangerous Goods) (Seam 3), Cargo Handling and Stowage (Dangerous Goods and Inspections) (Seam 4).

With regards to the need for acquiring knowledge and skills in tank sounding, water ballast sounding pipes were fabricated and installed practical exercises and assessments. Learning through these pipes was envisioned to be enhanced by having a manual.

This tank sounding manual primarily aims to enhance the knowledge and skills of students in taking tank sounding operations, uses and applications onboard. This goal addresses Seam 5 Teaching-Learning Objectives (TLO) 2 – ELO 2.4:10.1.1 - Determine the actions taken on Stranding (Grounding) and ELO 2.5:11.1.1 – Execute Actions to be Taken Following a Collision. The development of the tank sounding manual was based on the need to fully comply with STCW Table A-II/1, A-II/3, Function:

Navigation at the Operational Level Competence: Respond to Emergencies. The authors wanted to ensure that the methods for demonstrating competence, including practical training, are accomplished.

Design. The tank sounding manual was grounded on the program objective of the BSMT and BSMarE programs of producing competent graduates. The manual aims to provide students with knowledge, understanding and proficiency on shipboard operations and other related academic course outcomes. This objective aligns with the STCW Convention and STCW CODE 2017 edition, addressing Table A-II/1 on Cargo handling and stowage at the operational level, which targets "monitoring the loading, stowage, securing, care during voyage and unloading of cargoes" competence. Also, it covers knowledge, understanding and proficiency in Cargo handling Stowage and securing: Ability to establish and maintain effective communication during loading and unloading, and knowledge of safe handling, stowage and securing of cargoes, including dangerous, hazardous and harmful cargoes and their effect on the safety of life and of the ship. It also involves the competence of "inspecting and reporting defects and damage to cargo spaces, hatch covers and ballast tanks" and "knowledge and ability to explain where to look for damage and defects most commonly encountered due to loading and unloading." This manual relates to the Function - Controlling the operation of the ship and care for persons on board at the operational level, competence – maintaining seaworthiness of the ship, and knowledge, understanding and proficiency- Ship stability, understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.

Furthermore, the manual considered Table A-II/2 – Responding to navigational emergencies (Function - navigation at the management level and competence). It also regarded the knowledge, understanding and profiency - action to be taken if grounding is imminent and after grounding, action to be taken if a collision is imminent and following a collision or impairment of the water tight integrity of the hull by any cause, and assessment of damage control. Also, the manual considered the methods for demonstrating competence in this table which involves practical instruction.

Moreover, the Design phase covers the outline of the manual. The primary content of the tank sounding manual includes (1) Introduction to tank sound table, (2) Sounding and different methods of taking sounding on a ship, (3) What is sounding?, (4) Importance of sounding, (5) Methods for taking sounding on a ship, (6) When to take manual sounding, (7) Tools used for manual sounding, (8) How to take manual sounding?, and (9) Basic Maintenance of Sounding tape. Ballast Tank Arrangement, Capacity Notes, Water Ballast Tanks and Other Compartments, Procedure for Using Sounding Table, MAAP tank sounding, and forms **-** F-01-Training Exercise Tank Sounding and F-02-Training Assessment Tank Sounding, and Steps to Take Sounding using Sounding Tape.

Develop. In this phase, the manual was written. It includes discussions, instructional strategies, media, delivery methods, procedures, graphics or figures, exercises, assessments, and references used. The tank sounding tables and practical exercises are part of the Appendices of the manual.

Implement. This stage involves the pilot-testing of the manual. Both the instructors and students assessed the manual in terms of objectives, format, content, organization, language, and usability.

Some students expressed that the best aspect of the manual is its practical application on board and detailed instruction/process in obtain tank sounding. Specifically, some best aspects mentioned were: "clear and easy to follow instructions to solve manually," "a guide was provided to be followed in computing and the basics were explained," "the manual was developed for the midshipmen to learn tank sounding even without shipboard experience," "learner-friendly," "demonstrated proper procedures," "actual experience," "very informative," and other positive feedback.

On the other hand, some aspects that need to be corrected are having missing pages, which was already corrected. One suggested that the printed material should be hardbound to make it more durable. Others also commented that the format of the tank sounding form could be improved.

Evaluate. At this phase, the data gathered during the pilot-testing was processed. The result of the evaluation by the students is summarized in Table 2.

Table 2. Evaluation of the Tank Sounding Manual by the Students

Area	Means	Std. Deviation	Remarks
Objectives	4.87	.32	Excellent
Format	4.81	.38	Excellent
Content	4.85	.39	Excellent
Organization	4.83	.40	Excellent
Language	4.86	.32	Excellent
Usability	4.86	.32	Excellent
Overall	4.85	.34	Excellent

Evidently, the students considered the tank sounding manual excellent as indicated by each area mean and the overall mean. The students provided the highest mean rating on objectives (M=4.87, SD=0.32) while the lowest mean on the format (M=4.81, SD=0.38). The detailed mean and standard deviation of the ratings of students on the manual is shown in the Appendix section.

Specifically, the objectives aspect of evaluation involves the nature, purposes, and procedure of the manual. The strongest points of the manual concerning objectives were clearly defining what is to be learned and supporting the realization of the general objectives of the course. On the contrary, stating the possible skills to be acquired by the students upon successful completion of the subject gained the lowest mean.

Format deals with the structure, layout, and quality of the manual. In this area, organizing topics logically gained the top rating from the students. In contrast, the lowest mean was on exhibiting a visually appealing presentation hence sustaining learning.

Further, the perception of the students was compared to that of their instructors as test values in one-sample *t*-test as shown in Table 3. This comparison was done to determine if the students conformed to the assessment of the experts on the subject matter.

Table 3. Teacher vs Student Evaluation of the Tank Sounding Manual

Area	Faculty Mean Evaluation	Student Means	SD	$\|t\|$	Sig.	Remarks
Objectives	4.83	4.87	.32	0.86	0.39	Not significant; Do not reject Ho
Format	4.70	4.81	.38	2.06	0.05	Significant; Reject Ho
Content	4.83	4.85	.39	0.32	0.75	Not significant; Do not reject Ho
Organization	4.83	4.83	.40	0.04	0.97	Not significant; Do not reject Ho
Language	4.85	4.86	.32	0.26	0.79	Not significant; Do not reject Ho
Usability	4.77	4.86	.32	2.05	0.05	Significant; Reject Ho
Overall	4.80	4.85	.34	0.96	0.34	Not significant; Do not reject Ho

As shown in Table 3, the faculty experts provided high ratings on the different criteria of the tank sounding manual with an overall mean of 4.80 which is quite lower compared to that of the students (M=4.85, SD=0.34). However, the mean difference is not significant at 0.05 level; hence, the null hypothesis is not rejected.

Students' mean assessment of the different areas of the manual is generally higher compared to that of their teachers. This result is favorable as the experts and the users both have positive feedback on the manual developed. Students provided significantly higher mean ratings on format and usability. While they may be very satisfied with these areas, teachers, being more knowledgeable, see some areas where improvement should be considered.

4. Discussion

This study achieved its primarily goal of producing instructional materials to enhance the competence of students in tank sounding. With the support of the management, the improvised tank sounding pipes and other materials needed were in placed and are now being used by the students taking up Seamanship 5 course. The video presentation was also edited several times after thorough review by both the instructors and the students themselves. Positive feedback has inspired the instructors to innovate in their area as part of MAAP's continual process improvement system in the Academics Department.

With regards to the manual, this instructional aid supports deck students gain knowledge and skills in tank sounding, safe working practices and procedure in accordance with industry guideline, and personal shipboard safety. With the availability of the tank sounding manual and the instructional materials, the Seam 5 ELOs pertaining to this topic were fully accomplished.

Similar to the study of Roman (2016) and Torrefranca (2017), the results suggested that the developed manual satisfied the expert and student evaluators. Nonetheless, there are points to be considered to improve the manual in serving its purpose. Specific skills to be acquired by the students upon successful completion of the subject should be reviewed. The presentation of topics should be reviewed and improved to make it more visually appealing, hence, sustaining learning. For the content, providing more real-life applications of the lesson is needed. Also, presenting appropriate activities to the students should be reviewed.

Further, with respect to organization, unity of ideas should be reviewed especially on ordering things to make sense and easy to follow, connecting ideas with smooth transitions, guiding the readers through the chain of reasoning or progression of ideas, and displaying logical flow of ideas. Also, the language should be made clearer, and free from grammatical errors or possible misinterpretation. More ideas are needed to strengthen the learning interests of the students, offer meaningful experiences to the learners in learning the lessons, and develop new knowledge and skills.

The study is limited to the deck students who were under the tutelage of the authors as Seamanship 5 instructions. It does not include engine students, though they also need to acquire tank sounding skills.

5. Conclusions and Recommendations

The study's goal to produce instructional materials – tank sounding pipes, presentation and manual - to enhance student competence in tank sounding was realized. These instructional materials obtained positive feedback from both experts and students.

The tank sounding manual was considered excellent in terms of objectives, format, content, organization, language, and usability by both the instructors and the students. However, the manual was further improved considering the comments and suggestions of the evaluators.

On the other hand, it is recommended that the instructional materials be: (1) properly maintained to serve its purpose of enhancing student competence through practical skill demonstration; (2) digitized for distance learning; and (3) be used for all Seamanship classes. Further research might also be explored involving other courses and/or students.

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APPENDICES

A. Detailed Mean and Standard Deviation of Manual Evaluation Criteria

	N	Min	Max	Mean	SD		N	Min	Max	Mean	SD
Nature1	50	3	5	4.92	.34	Coherence1	50	3	5	4.86	.40
Nature2	50	4	5	4.92	.27	Coherence2	50	2	5	4.84	.51
Nature3	50	2	5	4.84	.51	Coherence3	50	3	5	4.86	.40
Nature4	50	3	5	4.86	.40	Coherence4	50	3	5	4.80	.45
Nature5	50	3	5	4.86	.40	Coherence5	50	2	5	4.80	.53
NATURE	50	3.00	5.00	4.88	.35	COHERENCE	50	2.60	5.00	4.83	.42
Purpose1	50	3	5	4.86	.40	Unity1	50	3	5	4.80	.45
Purpose2	50	4	5	4.90	.30	Unity2	50	2	5	4.80	.57
Purpose3	50	4	5	4.88	.33	Unity3	50	3	5	4.80	.45
Purpose4	50	3	5	4.84	.42	Unity4	50	3	5	4.88	.39
Purpose5	50	4	5	4.86	.35	Unity5	50	3	5	4.80	.45
PURPOSE	50	3.60	5.00	4.87	.32	UNITY of IDEAS	50	2.80	5.00	4.82	.41
PROC1	50	3	5	4.82	.44	Emphasis1	50	3	5	4.84	.42
PROC2	50	4	5	4.90	.30	Emphasis2	50	3	5	4.84	.42
PROC3	50	3	5	4.84	.42	Emphasis3	50	2	5	4.84	.51
PROC4	50	4	5	4.90	.30	Emphasis4	50	3	5	4.82	.44
PROC5	50	3	5	4.84	.42	Emphasis5	50	3	5	4.86	.40
PROCEDURE	50	3.40	5.00	4.86	.35	EMPHASIS	50	2.80	5.00	4.84	.40
Structure1	50	4	5	4.88	.33	Relevance1	50	3	5	4.84	.42
Structure2	50	4	5	4.80	.40	Relevance2	50	2	5	4.80	.53
Structure3	50	4	5	4.82	.39	Relevance3	50	3	5	4.80	.45
Structure4	50	3	5	4.78	.46	Relevance4	50	3	5	4.86	.40
Structure5	50	4	5	4.86	.35	Relevance5	50	3	5	4.82	.44
STRUCTURE	50	3.80	5.00	4.83	.33	RELEVANCE	50	2.80	5.00	4.82	.41
Layout1	50	3	5	4.80	.45	Communicative1	50	3	5	4.82	.44
Layout2	50	3	5	4.80	.45	Communicative2	50	3	5	4.82	.44
Layout3	50	3	5	4.80	.45	Communicative3	50	3	5	4.82	.48
Layout4	50	3	5	4.82	.44	Communicative4	50	4	5	4.84	.37
Layout5	50	2	5	4.74	.60	Communicative5	50	4	5	4.90	.30
LAYOUT	50	2.80	5.00	4.79	.43	COMM	50	3.40	5.00	4.84	.36
Quality1	50	3	5	4.80	.45	Language1	50	3	5	4.88	.39
Quality2	50	3	5	4.82	.44	Language2	50	4	5	4.88	.33
Quality3	50	3	5	4.84	.42	Language3	50	4	5	4.86	.35
Quality4	50	3	5	4.80	.45	Language4	50	4	5	4.88	.33
Quality5	50	3	5	4.80	.45	Language5	50	4	5	4.92	.27
QUALITY	50	3.00	5.00	4.81	.41	LANGUAGE	50	3.80	5.00	4.88	.30
Logical1	50	3	5	4.90	.36	Effectivity1	50	4	5	4.90	.30
Logical2	50	2	5	4.84	.51	Effectivity2	50	3	5	4.88	.39
Logical3	50	3	5	4.86	.40	Effectivity3	50	4	5	4.84	.37
Logical4	50	3	5	4.86	.40	Effectivity4	50	4	5	4.88	.33
Logical5	50	2	5	4.86	.50	Effectivity5	50	4	5	4.86	.35
LOGICAL	50	2.60	5.00	4.86	.41	EFFECTIVITY	50	3.80	5.00	4.87	.30
Consistency1	50	3	5	4.84	.42	Efficiency1	50	4	5	4.90	.30
Consistency2	50	3	5	4.88	.39	Efficiency2	50	4	5	4.82	.39
Consistency3	50	3	5	4.88	.39	Efficiency3	50	3	5	4.86	.40
Consistency4	50	3	5	4.84	.42	Efficiency4	50	4	5	4.88	.33
Consistency5	50	3	5	4.86	.40	Efficiency5	50	4	5	4.86	.35
CONSISTENCY	50	3.00	5.00	4.86	.39	EFFICIENCY	50	3.80	5.00	4.86	.31
Quality1	50	3	5	4.80	.45	Satisfaction1	50	3	5	4.82	.44
Quality2	50	3	5	4.78	.46	Satisfaction2	50	3	5	4.86	.40
Quality3	50	2	5	4.78	.55	Satisfaction3	50	3	5	4.82	.44
Quality4	50	3	5	4.84	.42	Satisfaction4	50	3	5	4.88	.39
Quality5	50	3	5	4.90	.36	Satisfaction5	50	3	5	4.86	.40
QTY	50	2.80	5.00	4.82	.41	SATISFACTION	50	3.20	5.00	4.85	.37

Student's Feedback on SEAM 2 Workbook and Instructor's Teaching Performance on the Modern Classroom

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The study is a descriptive study that was undertaken to evaluate the utilization of the Seamanship 2 workbook. The study is focused on the Workbook's content. Specifically, it highlighted the alignment of its core aspects like learning objectives, coherence, concepts and processes and learning activities. In addition, teachers' teaching performance and delivery of classroom instruction under the course were also covered in the study. Purposive sampling was used to gather responses involving 127 fourth-class Deck cadets of the International Maritime Employers Council (IMEC) and International Mariners Management Association of Japan (IMMAJ) Campuses. The academic year covers the second semester of the Academic Year 2020-2021. Data were gathered from respondents using a survey questionnaire administered online. Furthermore, data were examined using descriptive statistics, frequency, and percentages. The findings revealed that most students asserted that the SEAM 2 workbook's content is aligned in learning objectives, coherence, concepts and process and learning activities. Furthermore, students agreed that the teacher could teach well and deliver classroom instructions with appropriate teaching techniques and methodologies. Finally, with the overall utilization of the materials, students remarked it was good. Thus, it is recommended to explore hybrid teaching or blended learning. The online teaching and learning modality may provide better results for students' success in education.

KEYWORDS: *Content alignment, Online modality, Classroom delivery, Hybrid teaching and learning*

1. Introduction

The blue economy has attested that the rules of navigation and shipping are constantly changing. Deck officers are challenged to carry out the most crucial navigation and cargo handling tasks. Consequently, a new challenge arrived at present - the pandemic, COVID19. Teaching such courses has put maritime professionals to the test on how to deliver this course online.

With the present situation, the Maritime Academy of Asia and the Pacific has adapted to the new standard educational scheme. In congruence with CHED's guidelines on CMO No. 20 series of 2021, the academy has made all possible means to have learning continuity to cater to students' learning needs.

Equipped with their skills and experiences, maritime professionals also engaged themselves in teaching and course planning, development and creation of learning materials. One of these endeavors is the Workbook for SEAM 2. Seamanship is one of the famous and essential books for cadets and deck officers. It provides seamanship knowledge, collision avoidance regulations, GMDSS requirements, rescue operation and pollution control, and the like.

Thus, with the developed Workbook, the present study aims to analyze its content and evaluate the teaching delivery of the instructors using the media portal of Google Classroom.

The study is focused on analyzing the student's feedback on the SEAM2 Workbook and the instructor's teaching performance in the modern classroom. It also involves aspects of the Workbook's content in terms of the learning objectives, relevance, concept and process, and learning methods/activities: most interesting and least interesting, the instructor's teaching performance in terms of knowledge and delivery style and the evaluation of SEAM 2 workbook as a teaching-learning material.

The following works of literature were included to support the study's primary purpose and specific objectives for better understanding.

Teachers have a critical role in boosting student learning and ensuring their future success in the educational system. Therefore, teacher performance directly impacts student learning, and student success should be used to evaluate teacher performance (Barbara C.Hunt, 2009). Teacher performance is a broad phrase that various researchers have defined, but the essential theme is the completion or execution of a job. Amin and colleagues, al. (2013) and Obilade (1999) describe teacher performance as their role in the school system throughout a certain period to achieve organizational goals.

In education, learning objectives are brief statements that describe what students will be expected to learn by the end of the school year, course, unit, lesson, project, or class period— education Reform, (2014). In many cases, learning objectives are the interim academic goals teachers establish for students working toward meeting more comprehensive learning standards. It describes what learners should know or be able to do at the end of the course that they could not do before. Wengroff, (2019).

Meanwhile, Nova Southeastern University, NSU (2019) stressed the importance of learning objectives. Instead of focusing on what the teacher will teach, learning objectives should focus on what students will be able to perform. The alignment of activities and assessments enables learners to focus on abilities relevant to the learning objectives, reducing wasted time. (Kurt, S. 2020).

Moreover, Johnson and Jones (2019) stated that content relevance as pertinence material to topics, situations, needs, or interests must also be aligned to other aspects of the learning resources.

It may be noted that instead of focusing on what the teacher will teach, learning objectives should focus on what students will be able to perform. In addition, the learning objectives must be communicated accurately and unambiguously using explicit and quantifiable verbs.

Thus, the heart of effective teaching and learning is alignment. For this to occur, Carnegie Mellon University (2022) emphasized that elements of instructional and learning materials like assessments, learning objectives, and instructional strategies must be closely aligned to reinforce one another.

Moreover, effective teaching also includes a proper selection of instructional materials. Relevance and appropriateness are essential to meet the needs of the students and fit the constraints of the teaching and learning environment, particularly online. The study by Terada (2019) revealed that students prefer low-effort learning strategies like listening to lectures despite doing better with active learning.

Accordingly, instructional materials are categorized into two: student-centered and teacher-centered. In the student-centered model, instructional resources can be used for tutorials, problem-solving, discovery, and review. In the teacher-centered model, resources are used to present supplementary or primary material in the classroom. Thus, knowing when and to whom it will be utilized is another factor. Indeed, teachers must also have mastery of instructional competencies to successfully instruct students to optimize knowledge and skill acquisition. (The Wing Institute, 2022).

Pezaro (2016) stated that a teacher's responsibility is to make decisions about how to best assist learners in learning under a given circumstance. Therefore, a teacher typically teaches with skill, intelligence, and appropriate caution, considering both their own and their students' ideas. Meanwhile, much of the instructor's impact on student learning occurs in the classroom. Although students bear co-responsibility for their learning, the instructor's effectiveness in motivating and guiding participants is often a critical determinant of success. The teacher’s teaching delivery also plays a vital role in students' learning acquisition.

With these all being mentioned, the last critical step to assess success in teaching and learning using a workbook as material is through course evaluation. Moallemi (2017) affirmed that materials evaluation is linked to the intended teaching and learning context of the course book and is "inevitably subjective and focuses on the users of materials" (Tomlinson 2012, p. 148).

As a result, all aspects of teaching and learning, as well as the use of relevant material, must be subjected to a continual assessment and improvement process.

The study is guided by Terry Anderson's Theory of Online Learning, which explains that effective learning should contain four overlapping components.

These four lenses are community-centered, knowledge-centered, learner-centered, and assessment-centered learning. Terry Anderson's Theory of Online Learning states that teaching online must cover these four lenses. This scope must be commensurate to the course and learning objectives, activities and assessment of community expectations and needs, learners' knowledge, and application to real-world settings.

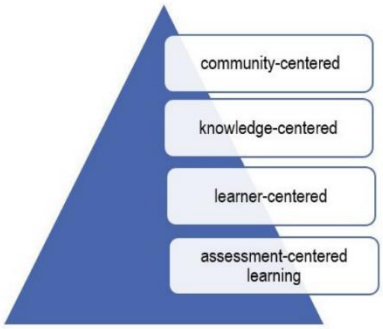

Figure 1. Terry Anderson's Theory of Online Learning

2. Methods

Research Design. The present study is descriptive research that has adopted the ADDIE model, which is meant to be completed in sequential order, from Analysis to Evaluation. However, ADDIE is designed to be a flexible, continuous process of improvements and iterations.

Addie is an acronym for the five stages of a development process: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model relies on each stage being done in the given order but with a focus on reflection and iteration. The model gives a streamlined, focused approach that provides feedback for continuous improvement. (Quigley, 2019)

The sequence of "ADDIE," which stands for Analyze, Design, Develop, Implement, and Evaluate, does not impose a strictly linear progression through the steps. Nevertheless, educators, instructional designers and training developers find this approach very useful because clearly defined stages facilitate the implementation of practical training tools. (Kurt, 2018).

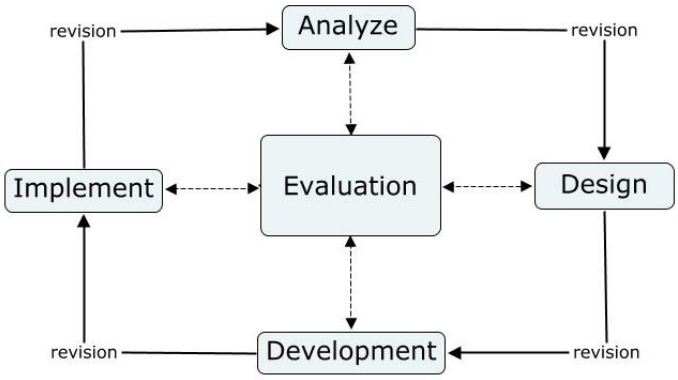

Figure 2. ADDIE Model of Instructional Design

It can be gleaned from Figure 2 that the ADDIE Model of Instructional Design (1975), as adopted on evaluation of the SEAM 2 workbook consists of the following components:

1. *Analysis*. The Analysis phase can be considered the "Goal-Setting Stage." In this phase, researchers distinguish between what the students already know and what they should know before using the material for the course. This was accomplished by carefully examining the requirements and alignment for the Seamanship 2 course.

2. Design. This stage establishes all objectives, performance indicators, testing, subject matter analysis, planning, and resource allocation. In addition, learning objectives, content, subject matter analysis, exercise, lesson preparation, assessment tools employed, and media selection are all priorities throughout the design process.

3. *Development*. The SEAM 2 workbook's development stage begins with the use of the selected approach. The researchers used the information gathered in the previous two stages to create the content that would reflect what is needed to be taught to the students. In this stage, problem-solving activities were incorporated on course topics like Displacement and Angle of Loll.

4. Implementation. The implementation stage represents the program's constant adjustment to ensure maximum efficiency and favorable outcomes. Here, the course content revisions were incorporated and delivered in classroom instructions. Users', both teachers' and students' feedback were recorded for future reference and material improvement.

5. Evaluation. Evaluation is the final stage of the ADDIE process. This is the stage in which the Workbook is thoroughly tested to determine the what, how, why, and when of the contents that were completed (or not completed) during the implementation stage. The primary purpose of the evaluation stage is to see if the objectives have been reached and to figure out what needs to be done next to improve the learning material's efficiency and success rate.

Description of the Participants Involved. The study involved fourth-class deck cadets taking Bachelor of Science in Marine Transportation who are purposively chosen. This is comprised of 10 deck sections from both IMEC and IMMAJ campuses with Mirfak (13), Nunki (17), Yamamoto (17), Yoshika (11), Alphard (10), Bellatrix (20), Fomalhaut (3), Hadar (9), Koga (14), Sukiyaki (13). The total population is comprised of 127 students who have taken up Seamanship 2 courses during the second semester, AY 2020-2021.

Data Gathering and Analysis Procedure. Convenience sampling was used for the respondents to gather responses from Google Forms. The answers were tabulated using descriptive statistics, i.e., frequencies and percentages.

The tool for gathering data was a survey questionnaire through Google Form. The questionnaire was developed based on a review of relevant literature and the researcher's observations during the course delivery. As a result, the researchers bracketed the data, making it possible to create a relatively simple questionnaire that used descriptive responses such as Good, Fair and Poor.

3. Results

Table 1.1. Alignment of SEAM 2's Learning Objectives, Relevance, Concept and Process and Activities

	Aligned		Somehow Aligned		Not Aligned	
Workbook Contents	(f)	(p)	(f)	(p)	(f)	(p)
Learning objectives	108	85%	-	-	19	15%
Relevance of Content	120	94%	1	0.7%	6	5%
Concept and Process	123	96%	-	-	4	3%
Activities	125	98%	1	0.7%	1	0.7%
Total:	f=127					

Table 1.1 depicts students' feedback on the alignment of SEAM 2 with its learning objectives, relevance, concepts and process and activities. It is noted that all the given aspects of the Workbook's content were all aligned with a percentage of 85% on learning objectives, 94% on relevance, 96 % on concepts and process and 98% on activities.

The Nova Southeastern University, NSU (2019) stressed the importance of learning objectives. Instead of focusing on what the teacher will teach, learning objectives should focus on what students will be able to perform. The alignment of activities and assessments enables learners to focus on abilities relevant to the learning objectives, reducing wasted time. (Kurt, S. 2020). Moreover, Johnson

and Jones (2019) stated that content relevance as pertinence material to topics, situations, needs, or interests must also be aligned to other aspects of the learning resources.

Thus, the heart of effective teaching and learning is alignment. For this to occur, Carnegie Mellon University (2022) emphasized that elements for instructional and learning materials like assessments, learning objectives, and instructional strategies must be closely aligned to reinforce one another.

Table 1.2. Students' Level of Interest Towards Learning Methods SEAM 2

Most Interesting	Methods in Learning SEAM2	Least Interesting
43.3%	**lecture and discussion**	12.6%
2.4%	**watching movie clips (YouTube clips)**	**58.3%**
25.2%	demonstrations and illustrations	6.3%
29.1%	problem solving	22.8%

It can be gleaned from Table 1.2 the students' level of interest in learning methods in SEAM 2. The students preferred lectures and discussions with 43.3% as the most exciting learning method in SEAM 2. This is opposed to Terada, (2019) that students prefer low-effort learning strategies like listening to lectures despite doing better with active learning. It may be argued that learners can achieve a significant deal of success with blended learning instead of the traditional mode of giving classroom instruction with full utilization of technology.

Table 2. Students' Feedback on Teachers' Teaching Performance and Delivery

	Agree		Neutral		Disagree	
	(f)	(p)	(f)	(p)	(f)	(p)
Possess knowledge on the subject matter	**109**	**86%**	0		18	14%
Selects appropriate teaching technique/method appropriate to the accomplishment of the objective.	**108**	**85%**	1	0.7 %	18	14%
Adjusts teaching delivery (technique) to meet the student's needs.	**107**	**84%**	2	2%	18	14%
Monitors students' progress and understanding throughout the lesson/topic.	**106**	**83%**	2		19	15%
Total:	f=127					

Table 2 presents students' feedback on teachers' performance and delivery of classroom instructions. Students' agreed that SEAM 2 teachers possess knowledge about the course, deliver lessons using appropriate teaching techniques/methods and monitor their progress.

Pezaro (2016) stated that a teacher's responsibility is to make decisions about how to best assist learners in learning under a given circumstance. Therefore, a teacher typically teaches with skill, intelligence, and appropriate caution, considering both their own and their students' ideas. Teachers must recognize that any decisions made in the classroom may not work efficiently. Therefore, they should monitor the effects of these actions over time, analyze the results, and adapt to ensure that students' learning is not adversely affected.

Table 3.Students' Overall Evaluation on SEAM 2 Workbook

Good	**85.8%**
Fair	14.2%
Poor	-

Table 3 shows the students' overall evaluation of the SEAM 2 workbook. Students who have utilized the learning material evaluated and remarked well with 85.8%. Moallemi (2017) affirmed that materials evaluation is linked to the intended teaching and learning context of the course book and is "inevitably subjective and focuses on the users of materials" (Tomlinson 2012, p. 148). Thus, other aspects of the learning material may be subjected to inclusion and further evaluation.

4. Discussion

The following implications were observed in the study: First, alignment is the foundation and critical aspect of a learning material's success. If learning objectives and learning activities/assessments are not aligned, teachers and students will waste time on activities, assignments, and assessments that do not lead to the desired goals. Nevertheless, it is critical to understand one's role as a teacher. Mastery of the subject matter, as well as the use of appropriate teaching techniques and methodologies, are required for learning to be enjoyable and successful. Indeed, the hybrid teaching and learning modality enable teachers to reach a broader diversity of students while providing learners with a choice of alternatives and activities.

5. Conclusions and Recommendations

It was observed that all areas of the Workbook's content were rated as aligned with the learning objectives, relevance, concepts and processes and activities. Lectures and discussions were the most interesting among the types of learning methods. More so, students agreed that the SEAM 2 teacher was knowledgeable about the subject, taught courses using appropriate teaching techniques/methods, and kept track of their progress. Students who had used the learning material gave it a positive evaluation and a rating of "good."

In view of the conclusions made, the following measures were recommended. First is to enforce alignment from any of the maritime courses, a regular check and balance (revisions and the likes) of the detailed teaching syllabus (DTS), Workbook, and Instruction's Guide (IG) may be done. Meanwhile, maritime professionals may update their professional skills through attending relevant webinars, training workshops or programs related to the course. This may sharpen their skills and expose them to contemporary teaching practices. Finally, it monitors the user's (students/instructors) feedback on the learning materials. This may be a tool for the check and balancing, as mentioned previously. Hence, another evaluation may be conducted involving other users of the learning material.

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Perception of MAAP Students towards Online Learning during the COVID-19 Pandemic

***Research Priority Area*: Enrichment of Student Life**

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ABSTRACT

The Covid-19 Pandemic has forced all HEIs to migrate from traditional face-to-face to online learning. This research aimed to study the students' Perceptions of the current Online knowledge, its beneficial characteristics, their attitude towards the future of Online education, and observations/challenges they are currently facing. It is a descriptive study employing mixed methods employing both Quantitative and Qualitative data. The research reveals that although it is clear the advantages and benefits that are provided by Online Learning in the continuation of education in the Academy, such as Flexibility, Documentation, and Easier access to references; the Perception and overall sentiment of the students considered 'Online Learning' as an alternative to learning. The fact remains that most students still prefer traditional face-to-face classes. Moreover, several challenges still need to be addressed due to the abrupt transition to Online learning. Thus, it underscores the need for the institution to strengthen the practices in the curriculum to make it more responsive to students' learning needs.

KEYWORDS: *Flexibility, Documentation, Easier access, Students' Learning*

1. Introduction

The Global Pandemic (COVID-19) has wreaked havoc on the Philippines' educational sector and all of the globe. It resulted in a succession of pedagogical developments that presented opportunities and risks to the quality of education.

According to the study of Tria, JZ (2020). In 2020, the Philippines had around 1.83 million students, distributed across over 2000 Private and Public Tertiary Institutions. The disruption of academic calendars by educational institutions around the country has resulted in online, distant, blended, and flexible learning we now commonly refer to as the 'New Normal'.

Due to the sudden closure of schools and the sudden transition to online learning, numerous difficulties and challenges in using Online Education were immediately felt by students, the faculty, and the educational institutions.

One of the most significant problems would be maintaining the Quality of Education. The quick transition to Online learning should be addressed by developing new learning strategies, training, administrative support, and professional development to enhance our current state of Online learning.

In Maritime Education, more than half of the country's MHEIs were initially closed; MAAP remained one of the few who could continue its operations while conforming with the IATF regulations. Driven by its Innovative strategies, including immediate adoption of the Learning Management System (LMS), Internet connectivity on the campus, and application of both Asynchronous and Synchronous modalities, it continued the Academic year 2020-2021.

Even after a year of its transition to Online learning, MAAP still has its barriers and challenges that must be explored, addressed, improved, and rectified. Thus, this study seeks the students' perceptions of online learning, its beneficial characteristics, their attitude toward the future of Online learning, and observations/challenges they are currently facing.

Review of Related Literature. With today's technology breakthroughs, we can develop flexible learning in various ways, including synchronous, asynchronous, blended learning, and other modalities. To make learning effective, educators should consider the preferences and perceptions of learners. The learner's choice is linked to their readiness or willingness to participate in collaborative learning and the elements that influence enthusiasm for online learning. It will also mention the advantages and disadvantages of online learning. The learnings from the review of related literature will be summarized in the following section.

The emergence of the Covid-19 Pandemic has disrupted much of on-site and online learning. Eight weeks into the pandemic, where core instruction was conducted online, a survey among 804 medical (Baczek et al., 2021) students in Poland showed that 69% of those surveyed staying at home while studying was an advantage while continuously accessing learning materials. Less than that (64%) pointed out that online learning allowed them to learn at their own pace amid comfortable surroundings. They pointed out two main disadvantages, however. Most (70%) noted a lack of contact with patients, and 54% noted difficulty with IT equipment. There was no significant difference between face-to-face and online learning regarding increasing knowledge in the study. However, online learning was significantly less effective than face-to-face instruction in growing skills and social competencies. In contrast, most of the respondents found online learning more enjoyable. However, they found themselves less active during online classes.

The research: "Students' perceptions of learning" (Nasution et al., 2021) shows that face-to-face learning is the most preferred learning type for students. Seventy-eight students chose face-to-face, 20 students chose blended learning, and only two chose to study online learning. This study's results show that face-to-face learning is significantly superior compared to blended learning.

In the study of Muilenburg & Berge (2005), the researchers determined the underlying constructs that comprise student barriers to online learning. The eight factors found were (a) administrative issues, (b) social interaction, (c) academic skills, (d) technical skills, (e) learner motivation, (f) time and support for studies, (g) cost and access to the Internet, and (h) technical problems. Independent variables that significantly affected student ratings of these barrier factors included: gender, age, ethnicity, type of learning institution, self-rating of online learning skills, the effectiveness of learning online, online learning enjoyment, prejudicial treatment in traditional classes, and the number of online courses completed.

Some studies highlighted that Face-to-face learning is still highly regarded by students as the better mode of learning. It mainly applies to skill-based education, such as in the fields of Medicine and Engineering. Although in the pandemic, we must make changes for learning to continue. Online learning has its pros and cons, as noted by these studies.

In a study by Miller (2019), he mentioned seven benefits of online learning: added flexibility and self-paced learning, better time management, demonstrated self–motivation, improved virtual communication and collaboration, broader, global perspective, refined critical thinking skills, and new technical skills.

An article about a phenomenological study on four Social Studies teachers in Negros Occidental Lazaga et al. (2021) found specific challenges and opportunities in eliciting in-depth responses to online interviews. The challenges that surfaced include Loss or lack of internet connection, confusion or adjustments, lack of motivation from students, and the tendency to become lazy. On the other hand, the online teachers considered the following advantages: the new technology, flexibility of time and locations, diverse and enriching experience, accessibility of learning resources, and collaboration among colleagues.

Online learning can also be in other modalities: Synchronous, Asynchronous, and Blended.

The year 2020 witnessed the plague brought about by the Coronavirus pandemic worldwide. The community lockdowns and quarantines challenged students and teachers in the instructional delivery system. Respondents who participated in a survey at Pangasinan State University (Pastor, 2020) answered an open-ended question on the possible problems with synchronous online delivery of instructions. Most surveyed said they were not ready for synchronous online education in this sentiment analysis. Most recommended that other delivery systems be provided to maintain excellence (Pastor, 2020).

Kim and Kim (2021) utilized survey data from 250 students enrolled in two asynchronous online courses at Kyung Hee University in Korea. Then, the collected survey data were analyzed using the structural equation model. From the results of the model verification, the following conclusions were obtained:

1. Course structure significantly positively affects student satisfaction and academic achievement in asynchronous online courses. It is desirable to design the overall organization of online courses. Learning objectives are clearly stated, and detailed guidelines on tasks and activities required during the class are provided.

2. Both student-student interaction and instructor presence positively affect student engagement. The quality of students' learning experiences can be enhanced by providing instructor feedback.

3. Student engagement positively affects student satisfaction, although it does not significantly impact academic achievement.

4. Student engagement only mediates the effect of student-student interaction on student satisfaction, not instructor presence on student satisfaction. Instructor presence may encourage students to participate in learning activities but not positively enhance student satisfaction.

Research results show that compared to students receiving traditional face-to-face teaching, a blended learning approach performed better on their national exam with a small to medium effect size (Cohen's *d*=0.23). Student course evaluations supported the blended learning delivery with small to medium effect sizes. The students reported that the digital resources supported their learning outcome, better understood the teacher's expectations, and were more satisfied with their virtual learning environment. This study adds to the growing literature on blended learning effectiveness in higher education. It suggests using digital resources to enrich teaching and enhance students' study experience. (Grønlien et al., 2021)

Various structures have been identified in the diverse literature, each providing an essential foundation for understanding students' perceptions of online education. Other papers have also identified potential barriers to online learning performance. On the other hand, few articles have sought to comprehend the student's perspective and preferences. Before the Covid-19 Pandemic, only a small number of distant education platforms used the online mode of education. With this study, the researcher attempts to address this gap by drawing insights from the literature in conceptualizing the problem and focusing on the Perceptions of Online learning.

Theoretical framework. This study is based on Harasim's "The Online Collaborative Learning (OCL) theory," which focuses on the Internet's capabilities to provide learning environments that foster collaboration and knowledge building. According to Harasim, OCL is "a new learning theory that focuses on collaborative learning, knowledge building, and Internet use as a means to reshape formal, non-formal, and informal education for the Knowledge Age" (Harasim, 2012, p. 81). Harasim sees the advantages of relocating teaching and learning to the Internet and implementing large-scale networked education. In OCL, there exist three phases of knowledge construction through discourse in a group: (1) Idea generating: the brainstorming phase, where divergent thoughts are gathered, (2) Idea organizing: the phase where ideas are compared, analyzed, and categorized through discussion and argument, and (3) Intellectual convergence: the phase where intellectual synthesis and consensus occur, including agreeing to disagree, usually through an assignment, essay, or another collaborative piece of work.

OCL also derives from the social constructivism theory, a social learning theory developed by Russian psychologist Lev Vygotsky, which suggests that individuals are active participants in creating their knowledge. Vygotsky believed that learning occurs primarily in social and cultural settings rather than solely within the individual. One of the core constructs of Vygotsky's theory of social constructivism is the zone of proximal development (ZPD), which emphasizes the role of the instructor in an individual's learning.

The ZPD distinguishes between activities that a student can complete alone and those that require the assistance of an instructor. According to the ZPD, students may understand and master knowledge and abilities that they would not be able to do independently with the support of an

instructor. Students are encouraged to work together to solve problems through dialogue, with the teacher as both educator and facilitator. The teacher is not viewed as a distinct entity but as an active facilitator of knowledge construction.

The OCL Theory quickly applies to the paradigm shift created by the pandemic. The fast transition from traditional face-to-face learning was immediately replaced by Online or Blended learning. A Virtual environment also replaced the social climate in a school setting. Moreover lastly, it fosters collaboration and knowledge building in the new Online or virtual environment, which is no longer confined to the four corners of a classroom and can expand exponentially across the globe.

Statement of the Problem. This study is primarily conducted to answer this problem: What is the Perception of MAAP students towards Online Learning during the COVID-19 pandemic?

Specifically, this research attempts to address the following problems:

1. How do the respondents rank the indicated characteristics of Online learning?
2. How much do the respondents consider the following characteristics beneficial to online learning?
3. Considering the global pandemic, how do the respondents rate future learning?
4. What are some comments, suggestions, and perceptions of the students with our current Online Learning system in MAAP?

Significance of the Study. The results of the study will be of great benefit to the following:

Faculty**.** The results will provide the faculty with student feedback on their teaching system, areas of praise, and areas for further improvement in learning delivery in an Online setting.

Researchers. This research, in turn, can also encourage other faculty/researchers to conduct follow-up studies with more specific content, which can lead to better strategies and approaches to Online learning.

Management. Results of the study can help develop policies concerning Online learning, which can improve and enhance the current system. It also voices out Challenges experienced by the students that need to be addressed.

2. Methods

Research Design. The research design used is a descriptive study utilizing quantitative and qualitative methods, also known as mixed methods. 'Mixed methods' is a methodology for conducting research that involves collecting, analyzing, and integrating quantitative and qualitative research.

A survey questionnaire was utilized as a source of primary data to describe the profile of the respondents of the study in terms of sex, year level, Maritime course, and Sponsoring company.

The survey also gathered quantitative data, which seeks to find the ranking of characteristics of Online learning. It includes variables such as Flexibility, Networking, Documentation, Instructor-student time, Easier access to references, Self-motivation, Critical-thinking skills, New technical skills, and evaluation of the benefits of these characteristics as utilized in Online learning. It also sought to find the respondents' perceptions of the future of Online learning.

The Qualitative method was utilized through an optional Open-ended question in the survey that asked about the respondents' Perceptions regarding the current Online Learning in MAAP.

Data Gathering Methods. The researcher prepared a Letter of Request to conduct the Survey questionnaire among the students currently enrolled in MAAP during the summer term of AY: 2020-2021.

Due to the strict implementation of IATF COVID protocols, survey questionnaires were handed out through Google forms and sent through the students' corporate emails. The survey was done on the first week of July 2021, and results were retrieved after three weeks.

Participants. The respondents of this study are first-year and second-year male and female students of the Maritime Academy of Asia and the Pacific, comprising a total population of 800 students currently enrolled in the Summer term, Academic year: 2021-2022.

Table 1. Profile of the Respondents

Profile	Category	Frequency	%
Sex	Male	251	95.08%
	Female	13	4.92%
Course	BS Marine Transportation	149	56.4%
	BS Marine Engineering	115	43.56%
Year level	First-year	155	58.71%
	Second-year	109	41.29%
Sponsor	IMEC	161	60.98%
	IMMAJ	87	32.95%
	Unsponsored	16	0.06%

Table 1 shows the frequency and percentage of the Respondents' profiles. The majority of respondents are Male students, which comprised 95% of the total sample, while Females account for the remaining 5% of the sample.

The results also show a close 50-50 ratio between the Two courses, with BS Marine Transportation having a 56% of the total sample. At the same time, the BS Marine Engineering students comprise the remaining 44% of the sample.

Per their current Year level, results also show a close 50-50 ratio between the year level of the respondents. The 1st year or 4cl midshipmen account for 59%, while the 2nd year or 3cl midshipmen account for the remaining 41%.

Moreover, most of them comprise the IMEC (European companies) at 61%, followed by the IMMAJ (Japanese companies) at 33%, and the remaining 0.06% are composed of Unsponsored midshipmen.

Data gathering tool. The self-made survey questionnaire was used as the Main instrument in gathering data. This study employed a five-part survey questionnaire.

The first part of the survey form consisted of five questions. These covered the profile characteristics of the respondents. The second part of the questionnaire consisted of eight questions indicating that respondents' ranking shows online learning characteristics. Their ranking viewed their Perception of the importance of online learning characteristics. The third part of the questionnaire

involved "How the respondents considered beneficial the indicated online learning characteristics". The fourth part of the questionnaire involved the respondents' ranking of the possible future of online learning. The fifth and last part involved an optional Open-ended question involving any comments/suggestions and observations regarding our ongoing Online learning in MAAP.

Data-gathering Procedure. The study respondents were all enrolled in MAAP during the summer term of AY: 2020-2021. Considering the total population of 800 students, the researcher used a computed sample size to determine the minimum number of individuals.

Using the following criteria, the researcher determined the sample size using a calculation formula called Andrew Fisher's Formula with confidence level of 95%, population size of 800, margin of error of 5%, and ideal sample size of 260. Since 264 respondents expressed their intention to fill out the survey questionnaire, it reached the ideal sample size for the study. Considering 264 is already 33% of the total population which is 800 students.

The researcher personally sent the survey instrument using google forms to their corporate emails. The respondents were given enough time to answer the questionnaires and retrieved them after three weeks.

3. Results

Table 2 presents the ranking of the characteristics of online learning as perceived by the students.

Table 2. *Ranking of the 8 Characteristics of Online Learning*

Characteristic	Weighted Mean	Rank
A. Flexibility	4.88	4th
B. Networking opportunities	5.03	3rd
C. Documentation	5.57	**1st**
D. Instructor-student time	3.32	**8th**
E. Easier access to references	5.26	2nd
F. Self-motivation	3.57	6th
G. Critical-thinking skills	3.56	7th
H. Technical skills	4.80	5th

Table 2 shows the results of the Data analysis. The ranking of the characteristics was determined by computing the Weighted mean of each characteristic (e.g., flexibility). The variable with the most significant value was ranked 1st and the most negligible as the 8th.

Results of the Ranking show that Documentation ranks as the most Beneficial characteristic of Online Learning, closely followed by Easier access to references and Networking opportunities. Most respondents revealed that Instructor-student time is the least characteristic.

Table 3 presents the mean perception of the students towards the different characteristics of online learning.

Table 3. Mean Attitude Towards Online Learning

Characteristics	Average	Remarks
A. Flexibility	3.87	Very beneficial
B.Networking opportunities	4.00	Very beneficial
C.Documentation	4.25	Most beneficial
D.Instructor-student time	3.30	Moderately beneficial
E. Easier access to reference	4.41	Most beneficial
F.Self-motivation	3.47	Moderately beneficial
G.Critical-thinking skills	3.55	Very beneficial
H.Technical skills	4.07	Very beneficial

Scale: 1.00-1.80 - Least beneficial; 1.81-2.60- Slightly beneficial; 2.61-3.40 - Moderately beneficial; 3.41-4.20 - Very beneficial; 4.21-5.00 - Most beneficial

As shown in Table 3, documentation and easier access to references were considered most beneficial areas. The least beneficial areas noted were instructor-student time and self-motivation.

Table 4 presents the mean attitude of students towards online learning.

Table 4. *Attitude toward Online Learning*

Criteria	Average	Remarks
A. Online learning is here to stay	3.23	Neutral
B. Traditional classes are better	4.51	Strongly agree
C. Online classes are the BEST	2.68	Neutral
D. Online classes are a good alternative	3.62	Agree

Scale: 1.00-1.80–Strongly disagree; 1.81-2.60-Disagree; 2.61-3.40-Neutral; 3.41-4.20-Agree; 4.21-5.00–Strongly Agree

As reflected in Table 4, the respondents regarded "Traditional classes are better" as Strongly agree, "Online learning is here to stay," and "Online classes are the BEST" as Neutral, and "Online classes are a good alternative" as Agree.

Further, it is astonishing to receive 93 replies out of the total 264 respondents (35%), considering that the last part of the questionnaire was only an optional one. Table 5 primarily reflects the challenges of the students' experience during the initial transition to Online Learning.

Table 5. *Respondents' Comments, Suggestions, and Observations of the current MAAP Online Learning*

Comments, Suggesstions and Observations	Comments, Suggesstions and Observations
ONLINE LEARNING • Monotonous • Lots of distractions • Lack of motivation • Potential of cheating • Fast-paced making it hard to retain knowledge • Hard to visualize the types of machinery • Face-to-face is far better than Online learning • Many prefer Blended learning with limited face-to-face for Major/core subjects.	**INSTRUCTORS** • Not well-versed in the Online platform • Should learn new strategies in teaching • Some instructors only give workbooks • Should give more engaging and interactive activities • Difficult to interact with the instructor to ask questions & clarification
INTERNET • Unstable • Slow • Freedom of internet use (limited)	**SIMULATORS** • The use of simulators is greatly encouraged, especially during Laboratory classes.
MAAP SEAS • Excellent in preventing cheating but hard to use	**REFERENCES** • Physical references should be provided, such as printed modules, hand-outs, and books that can be used in the dormitory.

4. Discussion

Results pointed out that most of the respondents considered several variables as either 'Most beneficial' or 'Very beneficial', implying the Benefits or advantages of Online learning. According to the study by Miller (2009), Online learning provided benefits such as added flexibility and self-paced learning, better time management, demonstrated self–motivation, improved virtual communication and collaboration, broader, global perspective, refined critical thinking, and new technical skills.

However, one of the most noticeable results was the variable: 'Instructor-student time' was considered the last ranked characteristic. In confluence with Janet et al.'s (2005) study, most of those surveyed pointed out that the significant disadvantage of online learning is the inadequacy for human interaction. Students draw peer support and deprive of the benefits of in-depth group discussions. It is also clear from the respondents' comments that learning in a Virtual classroom lacks the Humanistic approach and Social interaction only observed in a Face-to-face classroom set-up.

Most respondents still preferred traditional classes over online instruction. It stands to affirm findings in previous studies. For example, in the survey by Baczek et al., 2021, where 804 Medical students were surveyed, there was no significant difference between online and traditional learning regarding acquiring knowledge. In the same vein, the study also found that online learning was less advantageous in skill acquisition since there was less contact with patients.

In the case of this study, it would appear that traditional and online learning would scale the same in terms of knowledge acquisition however may differ in skill acquisition. The Maritime course is more inclined to Skills development honed by Laboratory classes which are currently strictly limited due to the pandemic. Respondents also noted that "It is tough to visualize types of machinery" and would prefer Blended learning with limited face-to-face when dealing with Major/Core subjects. Most students also wanted to use the Simulators during their Laboratory classes.

5. Conclusions and Recommendations

While it is clear that the advantages and benefits are given by Online Learning in the continuation of education in the Academy, such as Flexibility, Documentation, and Easier access to references; the students' Perception and overall sentiment of the students only consider ‘Online Learning’ as an alternative to learning. The fact remains that students still prefer the traditional face-to-face classes.

Moreover, due to the abrupt transition to Online learning, we still have several challenges and problems to identify, rectify, improve and further develop.

The researcher sincerely recommends producing related studies to document the impact of the pandemic on learning. He also underscores the need for the institution to strengthen the practices in the curriculum to make it more responsive to students' learning needs.

The researcher also believes that developing policies and regulations should include inputs from all stakeholders from the Top management, department heads, the faculty and staff, and our students. However, our utmost priority should always be our safety while observing the established pandemic protocols.

6. Acknowledgment

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Evaluating the Maintenance and Repair Workbook as a Teaching-Learning Material

***Research Priority Area*: Maritime Education - Curriculum Reengineering (instructional design, pedagogies)**

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ABSTRACT

The onslaught of the Covid-19 pandemic has forced the academe to adapt quickly to keep the education of students running. The challenge of taking classes online, considering the courses offered by the Maritime Academy of Asia and the Pacific (MAAP) that are highly practical and hands-on, is very much real. However, MAAP didn't just stop at conducting online lectures for its classes. One way of ensuring that the students still get quality education and complete learning is by developing new materials that can be useful and accessible despite the online setting. The Maintenance and Repair E306 Workbook has been launched for use with the MAAP Batch 2022. With this course material, it is hoped that more of such kind will be written and developed and would pave the way to enriching and expanding the resource bank of the academy. Primarily, this paper describes the content of the Workbook and its evaluation. Four marine engineering professionals gave their numerical and qualitative evaluations of the Workbook. Based on the responses, the workbook was seen as substantial course material. Recommendations from the same evaluators were considered in the final revision.

KEYWORDS: *COVID-19, Flexible learning, Course materials*

1. Introduction

The ongoing pandemic has forced not just the health sector but every area of society to change and adapt as quickly as possible. This included the education sector. Although this Covid-19 crisis is a global dilemma, the country has to look into arrangements and remedies that are most relevant to our setting and thus, through the Department of Education and Commission on Higher Education, the CHED Memorandum No. 4 Series of 2020 was declared across the educational system of the archipelago:

"For higher education institutions, avoiding and limiting the risks of infection of the academic community has become a primordial concern. Hence, with the implementation of community quarantine, the conduct of classes needed to be immediately suspended. The arduous challenge then was how to continue teaching and learning beyond the usual face-to-face instruction." (Rationale, CHED Memorandum No. 04 Series of 2020).

Part of the considerations noted before writing the Maintenance and Repair E306 Workbook is stipulated in the CHED Memorandum No. 4 Series of 2020:

"Flexible Learning is a pedagogical approach allowing flexibility of time, place, and audience including, but not solely focused on the use of technology. Although it commonly uses the delivery methods of distance education and facilities of education technology, this may vary depending on the technology, availability of devices, internet connectivity, level of digital literacy, and approaches." (Definition, CHED Memorandum No. 4 Series of 2020).

Although it has remained open to methods beyond technology, it says that the current method used in the classroom today is heavily patterned after distance education. A notable example would be the e-learning program of John B. Lacson Foundation Maritime University for its master's and doctoral studies, which are highly online and highly dependent on written learning materials.

Credit to the leadership and entire staff, the Maritime Academy of Asia and the Pacific was quick to respond and secure the community to create a safety bubble amongst students, staff, and faculty. However, the transitions made were far from easy. The student-to-faculty interaction has been reduced to nearly zero. All of a sudden, instructors have to become overnight experts at using an online platform to conduct their classes. For a highly hands-on and practical academy, one can only surmise how big of a challenge it has been to adapt for students and instructors alike.

Many online tools were put in place and made available such as the Google Meet platform, an in-house learning library called the Learning Management System (LMS), etc. However, a one-way, all-lecture learning setup will never be enough for students to learn. Hence, the idea of a subject workbook was birthed.

This research study will feature the Maintenance and Repair E306 workbook, which was drafted at the time when online learning was the only option, considering the limitations at hand and the nature of the subject matter itself, which is highly practical and hands-on, the teaching methods and materials have to adapt to the times. This is important to ensure that students receive quality learning still despite the limitations and would be as prepared for their profession as their counterparts who have studied during a more ideal situation. This workbook can be considered one of the early attempts to produce online learning materials for the subject matter. Therefore, there is much room for improvement, and future additions are most welcome.

This paper describes the content of the Workbook on Maintenance and Repair about the requirements set by the Department of Academics. It also presents the evaluation of the same material by marine engineering professionals.

This paper aimed to describe the experts' evaluation on the Maintenance and Repair E306 workbook.

2. Methods

To improve the content and other features of the Workbook, this paper employed the quantitative- descriptive design of research in the evaluation of the Maintenance and Repair workbook. There were four (4) professionals who evaluated the Workbook. These people gave their ratings based on the evaluation tool developed by the Department of Academics. The device has three evaluation criteria: content, with 14 items; presentation, with six (6) things; and learning, with seven (7) things. The responses of the marine engineers were encoded to get the mean and standard deviation, together with the descriptive interpretations, which were presented as the final data.

3. Results

Description of the Content of the Workbook. The Workbook has two (2) components used for the lecture and laboratory aspect of the Maintenance and Repair E306 subject.

Workbook for Lecture. The Workbook is subdivided and expanded by topics. Under each case, the specific discussion item is stated, as well as its course outcome and learning outcome. A short description of the case is also included. All these data are reflected from the Instructor's Guide (IG) to make sure that the material is aligned with the standard teaching guide.

After the short description, each topic is furnished with exercises in the form of at least two (2) questions. The rubrics for evaluating the questions' answers are also provided to guide the instructors in grading the exercises. After which, two (2) questions are provided as a reflection for students. These questions are answerable in short essays. This aims to check two (2) things from the students: their comprehension and thoughts about the topic, and their ability to express themselves through writing in English.

Several suggested activities or seatwork are provided in the form of crossword puzzles, online quiz games, and the like. The instructors may choose to use these or execute their ideas.

Workbook for Laboratory. For the laboratory, the Workbook is still subdivided according to topics and reflects the first few parts of the lecture workbook, such as the topic title, course outcome, and learning outcome. However, instead of answering questions as exercises and reflection points, each topic is provided with a specific activity that the students can execute practically. Each activity is a hands-on exercise and is given particular points for evaluation by the instructor in charge.

Evaluation of the Workbook. The Workbook was evaluated as one whole (lecture and laboratory combined) by four (4) marine engineering professionals. The evaluation process looked into three (3) aspects of the Workbook: Content (14 items), Presentation (7 items), and Learning (7 items). The evaluators also gave their comments in the end.

The scale used is as follows: 5 – I Strongly agree, 4 – Agree, 3 – Neither Agree nor Disagree, 2 – Disagree, and 1 – I Strongly Disagree.

Table 1 summarizes the evaluation made by the four marine engineering professionals in the Workbook.

Table 1. Workbook Evaluation by Experts

Evaluation Criteria	Mean	Standard Deviation	Descriptive Equivalent
Content	4.45	0.34	Above Average
Presentation	4.57	0.36	Excellent
Learning	4.54	0.33	Excellent
Average	4.52	0.36	Excellent

Legend: 1.00-1.49 Very Poor
1.50-2.49 Below Average
2.50-3.49 Average
3.50-4.49 Above Average
4.50-5.00 Excellent

As reflected in Table 1, the marine engineering professionals considered the Maintenance and Repair E306 Workbook. Presentation obtained the highest mean evaluation; followed by learning and content. One of the evaluators expressed that the workbook is aligned with the DTS along with the course objectives (CO), learning objectives (LO), and exercises. Another evaluator stated that the lecture and laboratory workbook help and aid the student in their learning process.

For improvement, one evaluator mentioned that learning and development of this kind of materials are never ending; since modernization embraced the present, updating [these] tools are necessary frequently. Another instructor observed that the content of the Workbook is not sufficient and needs more review.

4. Discussion

The Workbook has plenty of room for enhancement and improvement, as mentioned and implied in the comments. Since this can be considered an initial attempt to develop this kind of course material, it is recommended to treat it as a working material. A regular review of workbooks must also be considered to ensure the relevance and efficacy of the materials, mainly because, like, in the case of the Maintenance and Repair E306 Workbook, it has been written to meet the requirements of a specific season and setup.

The ultimate goal for this Workbook and for the succeeding course materials to be written would be to provide a wide range of relevant and content-extensive resource materials that can be accessed and used by both students and instructors, whether in an e-learning setting or a face-to-face setup.

The course materials and the systems that have been set in place to address the demands of the pandemic should not be treated as temporary but as an opportunity to enrich the educational experience of both students and instructors.

As soon as the Covid-19 situation is contained, it can be expected that education will not go back to where it has been before the pandemic. That is why, it is imperative that measures to prepare for what is up ahead must be made.

It is also hoped that the Maintenance and Repair E306 Workbook can gather measurable feedback from the students and more instructors in the future. The data collected from these evaluations must include recommendations for improvement. The Discussion section relates the study's results to previously published data in the most concise style. It notes areas of consensus with and divergence from previous work. Repeating the results is not necessary and not wanted. Relevant literature is covered. The implications of the study are also clearly defined in this section.

5. Conclusions and Recommendations

Writing the Workbook for Maintenance and Repair E306 is a response to meeting the need for more materials that are relevant and usable for the current online setting in classes. Although addressing a specific need in an extraordinary season, the author of this course material aims for its content to be still valuable and helpful once face-to-face classes resume. Therefore, it is highly recommended that this learning material be revisited and expanded regularly to contain more ideas and tools for instructors to encourage their prerogative and creativity as they conduct their classes. It is also hoped that through this research report, more materials of this kind will be written, and the resource system of the academy will be enriched and expanded further.

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Development of A Pipe Beveling Machine
For Gas Cutting Operation

***Research Priority Area*: Maritime Education - Innovations in Maritime Education**

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ABSTRACT

The problem of manual gas cutting the pipes is exceptionally slow, inaccurate, and requires hours of hand grinding to prepare for welding. There are existing pipe beveling machines in the market, but it is expensive. In MAAP, there is no existing pipe beveling machine in Machine Shop Welding Laboratory. Researchers develop the idea to fabricate one pipe beveling machine to maximize the use of a dividing head for the milling machine as a rotator for the pipe beveling machine. Design will be based on the existing design found in the market but with different gear ratios and additional features such as angle adjustment for pipe cutting, other torch holders, and pipe support that can accommodate 4 inches down to 2 inches pipe. With the fabrication of this machine, the students, specifically those who are taking Machine Shop 3 (Welding course), will be benefitted from pipe welding preparation.

KEYWORDS: ***Pipe welding, Pipe cutting***

1. Introduction

Origin and Justification of The Study. Metal machining industry today presents a continually growing and changing series of opportunities for skilled machinists and welders. Job outlook in metal machining, whether in small specialty shops or large industries, remains very positive due to slow but constant demands for parts that are machine fabricated.

In Machine Shop 3 course, students will be trained to develop their skills in welding fabrication and repair for their shipboard career. Students should have excellent manual skills, specifically in welding, fabrication and cutting operation; they should understand the basic principles of the gas cutting operation, both manual and with the use of an automatic cutting machine, such as a pipe beveling machine.

The requirement for National Certificate 2 (SMAW NC 2- Shielded Metal Arc Welding) is one of the requirements, especially for Engine Cadets, before going on shipboard training. Students must undergo 38 days of SMAW training course to prepare for NC 2 written and practical examination. During their training, students are tasked to prepare a 60-degree angle cut for a 4inch diameter pipe as their workpiece for the 6-G weld position.

Pipe beveling cutting is a backbreaking process, especially if it is done manually in the oxyacetylene cutting operation. Sophisticated pipe beveling machines are needed for pipe beveling processes. In the absence of a pipe beveling machine in the Machine Shop Welding laboratory, the preparation time for pipe welding will be extended, causing more time is wasted on pipe beveling preparation than on welding processes. Researchers have decided to develop a pipe beveling machine that students can use in pipe beveling preparation thus reducing the time consumption for the operation. This device will aid the trainees/ students to attain an excellent form/ shape of pipe beveled cut.

Objectives of the Study. The study's objectives are to develop a pipe beveling machine out of locally available materials in the shop, and maximize the use of the dividing head use for the Milling Machine. It will serve as a holder and pipe rotator that will provide ease and convenience in pipe beveling operations, minimize time, effort, and energy in doing the task, and enables the teacher/instructor to impart the skills in pipe preparation and cutting operation accurately.

Also, the study aims to determine its acceptability in terms of precision, user-friendliness, stability, safety, and physical features.

Limitations of the Study. The study is limited to the development/ fabrication and testing of the machine for faster and more precise pipe beveling preparation. Machine will be designed to accommodate 2 inches up to 4 inches diameter pipe with a minimum length of 4inches and a maximum length of 40 inches used for different pipe weld operations.

Significance of the Study. The results of the study will be of great benefit to the following:

Student: The device will ease the burden of the students in cutting a pipe angle slope in preparation for National Certificate II (6G pipe welding) given by TESDA as a requirement for shipboard training.

Instructors: A pipe beveling machine will be an excellent help for pipe welding for their class demonstration.

Welders: The device will also benefit welders and fabrication in pipe joining because it will lessen the time in material preparation for pipe beveling.

Review of Related Literature and Study

Oxygen-Fuel Cutting. Oxygen-Fuel cutting is a chemical reaction between pure oxygen and steel to form iron oxide. Oxygen-Fuel cutting can be described as rapid, controlled rusting. Preheat flames raise the surface or edge of the steel to approximately 1800°F (bright red color). Oxygen is then directed toward the heated area in a fine, high-pressure stream. Steel is oxidized and blown away to form a cavity, the preheat and oxygen stream move at a constant speed to create and start a continuous cut. Metals whose oxides have a lower melting point than the base metal itself can be cut with this process. As soon as the metal oxidizes, it terminates the oxidation by forming a protective crust. Low carbon steel and some low alloys meet the above condition and can be cut effectively with the Oxygen-Fuel process.

Cutting processes - application of Oxygen-Fuel cutting. Oxygen-Fuel is one of the most widely used cutting processes with the following benefits: Low-cost equipment; Essential equipment suitable for cutting, gouging and other jobs such as welding and heating; Portable, suitable for site work; Manual and mechanized operations; Mild and low alloy steels (but not aluminum or stainless steel), and; Wide range of thickness (typically from 1mm to 1000mm).

It is therefore not surprising that the Pipe Beveling process can be used for a diverse range of applications, from manual rough severing and scrap cutting to precision contour cutting in fully automated systems. Pipe Beveling process application includes the choice of fuel gas and nozzle, including design to maximize performance. Practice to ensure adequate quality of the cut surface is also included.

Pipe cutting. The freehand pipe cutting process may be done in one of two ways. Small diameter pipe, usually under three inches (76mm), the torch tip is held straight up and down and moves from the center to each side (Fig.1). This technique can also be used successfully on larger pipes.

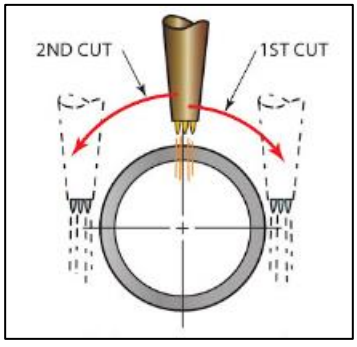

Figure 1. *A small pipe diameter can be cut without changing the angle of the torch. After the tube is cut, roll the tube to cut the bottom.*

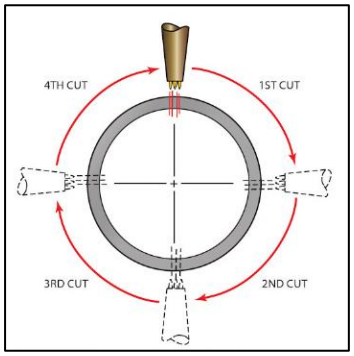

Figure 2. *A large diameter pipe, torch is turned to keep it at a right angle to the line. Tube should be cut as far as possible before stopping and turning it.*

For larger pipes, three inches (76mm) and more extensive, the cutting torch is always pointed toward the center of the pipe (Fig.2). This technique is also used in all sizes of heavy walled tubes and can be used on some smaller pipe sizes.

The torch body should be held so that it is parallel to the centerline of the pipe. Supporting the torch parallel helps to keep the cut square.

Choice of fuel gas. The mixture of oxygen and a fuel gas (acetylene, propane, MAPP propylene or methane) is used to preheat the metal to its 'ignition' temperature, which is well below its melting point. Jet of pure oxygen is then directed into the preheat area, which burns through the spot and the resulting molten metal and slag is removed by the high-velocity oxygen stream. Quality of flame determines the cutting speed of the process, but fuel gas/oxygen flame determines the preheating rate. Choice of fuel gas has a significant influence on the time taken to initiate the cutting operation. This is especially important if the designed cut begins by piercing.

Choice of fuel gas is primarily composed of cost, performance, ease of use, and anyhow, it is a manual or mechanized operation. In making a choice, it should be mentioned that in an ordinary application, the sum is composed up of approximately: 50% overheads, 30% handling labor, 18% cutting labor, and 1-2% gas.

Consideration should, therefore, be given to the choice of fuel gas type and nozzle design to speed up the initiation of the cutting operation. Labor costs can be reduced by decreasing the pierce time and, or increasing the cutting speed. Flame temperatures and fuel gas to oxygen ratios are shown in Figure 3. Fuel gases that generate a higher flame temperature and require lower oxygen to fuel gas ratio will speed up the cutting operation.

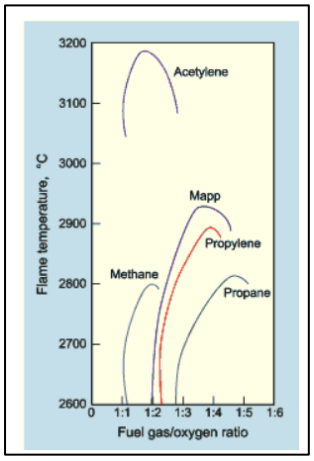

Figure 3. *Flame Temperature and the Fuel Gas to Oxygen Ratio Acetylene*

Acetylene produces the highest flame temperature of all the fuel gases and generates a highly focused flame. Pierce time is approximately one-third that achieved with propane, it should be used when the shoot time is a significant proportion of the total cutting time, for example, short cuts and multi-pierce cutting operations.

The elevated temperature (maximum flame temperature in oxygen is 3160°C), and highly focused flame make the oxyacetylene process ideal for cutting bony sheets with minimum distortion and for bevel cutting. High sum and low heat generation make it less proper for general heating with great plates.

Propane. Propane is low-cost and has the advantage of being available in bulk supplies. Flame temperature is lower than for acetylene (the most significant flame temperature in oxygen is 2828°C compared with 3160°C for acetylene) which composed piercing mighty slower. It can tolerate a more valuable nozzle to workpiece distance which reduces the risk of molten metal splashing backside onto the nozzle and causing a 'backfire.'

For similar nozzle designs, cutting speeds for oxy propane and oxyacetylene are identical. Advantage of propane are composed of cut edge, less slag adhesion and lower plate edge hardening due to the lower flame temperature. The heat-affected area is much mighty broader than for oxyacetylene.

MAPP. MAPP gas is a mixture of various hydrocarbons, principally methylacetylene and propadiene, produces a relatively hot flame (2976°C). Lower calorific value of the inner cone than acetylene gives a slightly slower pierce time.

The gas is seen as an alternative to acetylene with greater tolerance to torch distance variation because of the more uniformly distributed heat between the inner and the outer cones.

Only acetylene, hydrogen, and MAPP have sufficiently high flame temperature for underwater cutting. Nevertheless acetylene has a limited outlet pressure, MAPP is the only gas other than hydrogen that can be used to cut in deep water.

Propylene. It is a liquid petroleum gas (LPG) product with a similar flame temperature to MAPP (2896°C compared to 2976°C for MAPP). Gives off a high heat release in the outer cone (72,000 kJ/m3). Like propane, it has the disadvantage of having a high stoichiometric oxygen requirement (oxygen to fuel gas ratio of approximately 3.7 to 1 by volume).

Methane. It has the lowest flame temperature similar to propane and the lowest total heat value of the commonly used fuel gases. Nevertheless, natural gas is the slowest for piercing.

Cutting torch. The cutting torch design can be either a nozzle mix or an injector. Combine torch, the fuel gas and preheat oxygen are mixed in the nozzle. In the injector torch, the preheat gases mix either in the torch's body, within the gas delivery tubes, or on the head of the torch. Injector torch have the advantage of using a higher pressure of oxygen to pull the fuel into the torch. Cutting torch allows the torch to be used at low fuel gas pressures or with significant pressure drops such as those experienced through long hose lengths.

Nozzle. The primary functions of the nozzle are to provide: a method to preheat the metal to its ignition temperature, and a jet of oxygen to react with the material to be cut and at an equally sweep rate sufficient to blow away the slag.

Each torch jet should be fitted with the appropriate nozzle for the type of fuel gas. Nozzles can be of a one- or two-piece design. Nozzle type will depend on: fuel gas, manual or machine operation, and manufacturer's preference.

Acetylene nozzles are usually one-piece, but two-piece nozzles similar to those for other fuel gases are produced for machine cutting.

The diameter of the cutting oxygen hole is selected according to the material thickness. There are two types of nozzle; standard and high speed. Standard nozzle usually has a parallel-sided, central bore for the oxygen jet, surrounded by an annulus or a ring of smaller diameter ports for the preheat gas mixture, Figure 4. There are many designs and arrangements of the preheat ports that focus the flame for heating and protecting the oxygen jet from air entrainment.

Figure 4. *Standard nozzle with central bore for oxygen jet and a ring of ports preheat gas mixture*

High-speed nozzles can be used with higher oxygen pressures, up to 10 bar. Key variance is that the cutting oxygen is forced over a convergent/divergent orifice which speeds up the gas sweep rate to near-supersonic levels. High-speed nozzles are primarily used in mechanized equipment to exploit the higher speeds for cutting long lengths.

Cutting conditions usually are set to produce a fine cut surface finish for the application but at the highest cutting speed. Therefore, consideration is given to the following settings for the material thickness and the cutting speed: Nozzle distance - too high or too low will disturb oxygen flow. Preheat flame - too high a flow can cause top edge melting. Cutting oxygen - too low a flow can cause poor slag removal - too high a flow can result in the poor cut finish.

The typical appearances of a good and the poor quality cut surface for manual cutting are shown in Figure 5 below. Principal features are described with their cause and remedial measures necessary to produce the ideal square edge, and smooth surface cut.

Figure 5. *Ideal Cut*
Features: Square edge, smooth cut surface, free of slag, small draglines

Figure 6. *Cutting Too Fast*
Features: Coarse draglines at an angle to the underside surface with an excessive amount of slag sticking to the bottom edge of the plate
Cause: Oxygen jet trailing with insufficient oxygen reaching the bottom of the cut

Figure 7. *Too high plate nozzle to pate distance*
Features: Uneven cut surface with heavy melting of the top edge, coarse draglines at the bottom cut surface.
Cause: Preheat is not focused on the plate surface, and oxygen jet is easily disturbed.

Figure 8. *Too High Oxygen Flow*
Features: Excessive slag adhering to cut face, local gouging, excessive top edge melting on the material.
Cause: Turbulence between the preheat flame and the cutting jet.

Slag. Slag is found on bad cuts due to dirty tips, too much preheat, too slow a travel speed, too short coupling distance, or incorrect oxygen pressure. Two types of slag produced during a cut are soft slag and hard slag. Soft slag is very porous, brittle, and easily removed from a cut. Little or no unoxidized iron in it. Soft slag may be found on some good reductions. Hard slag may be mixed with soft slag. Hard slag is attached solidly to the base edge of a cut, and it needs a lot of chipping and grinding to be removed. There's a lot of 30% to 40% or more unoxidized iron content, and the more rough the slag is to be precise.

Concept of the study. Based on experience, literature, relevant studies, and other material read by the proponent, a concept has evolved. The proponents decided to develop a Pipe Beveling Machine out of locally available materials found in the Machine Shop Laboratory and to maximize the use of the dividing head as a pipe rotator for the pipe beveling machine. The device is rigid, and the dividing head is detachable to use in milling works. The dividing head will serve as a pipe rotator fitted in a fabricated table, with torch holder attachment, and pipe support to accommodate 2 – 4 inches pipe.

The pictorial drawing of the device is illustrated in figure 9. The project consists of three (3) major/assemblies : pipe rotator, torch holder, adjustable pipe support, and table that will serve as a base assembly.

Pipe Rotator. The pipe rotator (shown in Fig. 10) holds the pipe and serves as a pipe rotator, and its primary function is to rotate the pipe at an ideal pipe speed depending on the pipe thickness to ensure smooth pipe bevel cutting operations. The rotator is fitted in a fabricated work table to ensure rigidity of the pipe rotation processes.

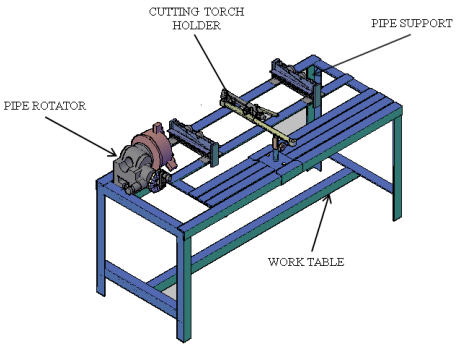

Figure 9. Pipe Beveling machine

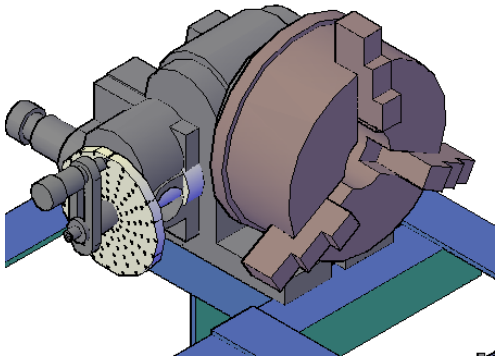

Figure 10. Pipe Rotator

Cutting Torch Holder Assembly. It consists of a Torch holder that will adjust the Unitor cutting torch attachment, with pipe angle adjustment to accommodate 30°, 60°, and 90° bevel settings. Cutting torch holder (Shown in Fig.11) assembly has a height adjustment to accommodate different pipe sizes. The base will slide along the table for extra pipe lengths from 1 inch to 50 inches. Cutting torch assembly will serve as a guide for pipe cutting operation to achieve the desired pipe bevel angle.

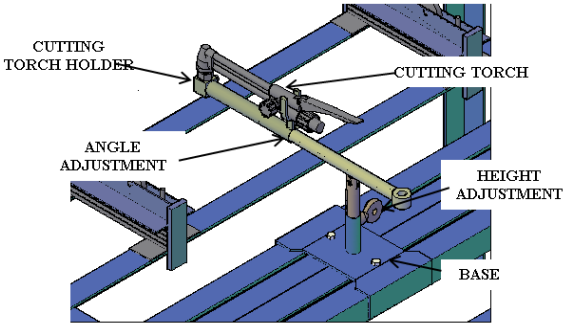

Figure 11. *Cutting Torch Holder*

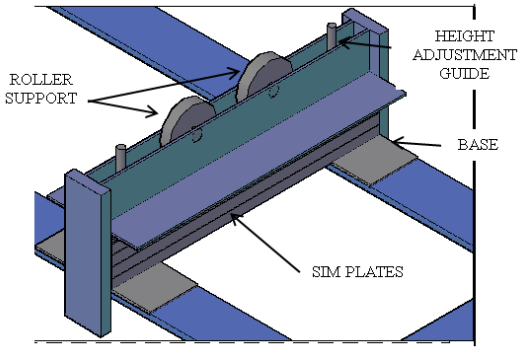

Figure 12. *Pipe Support Assembly*

Pipe Support Assembly. The pipe support base assembly (Shown in Fig. 12) consists of two rollers, a table guide, and a series of sim plates for different pipe diameter sizes. The assembly will serve as a support guide during cutting operation to catch the weight of the pipe to lessen the weight carried by the pipe rotator to ensure smooth rotation during cutting processes. The assembly slides along the table to accommodate different pipe diameters and lengths. The series of sim plates lift the roller for different pipe diameters.

Conceptual Process. Figure 13 shows the conceptual process of the study.

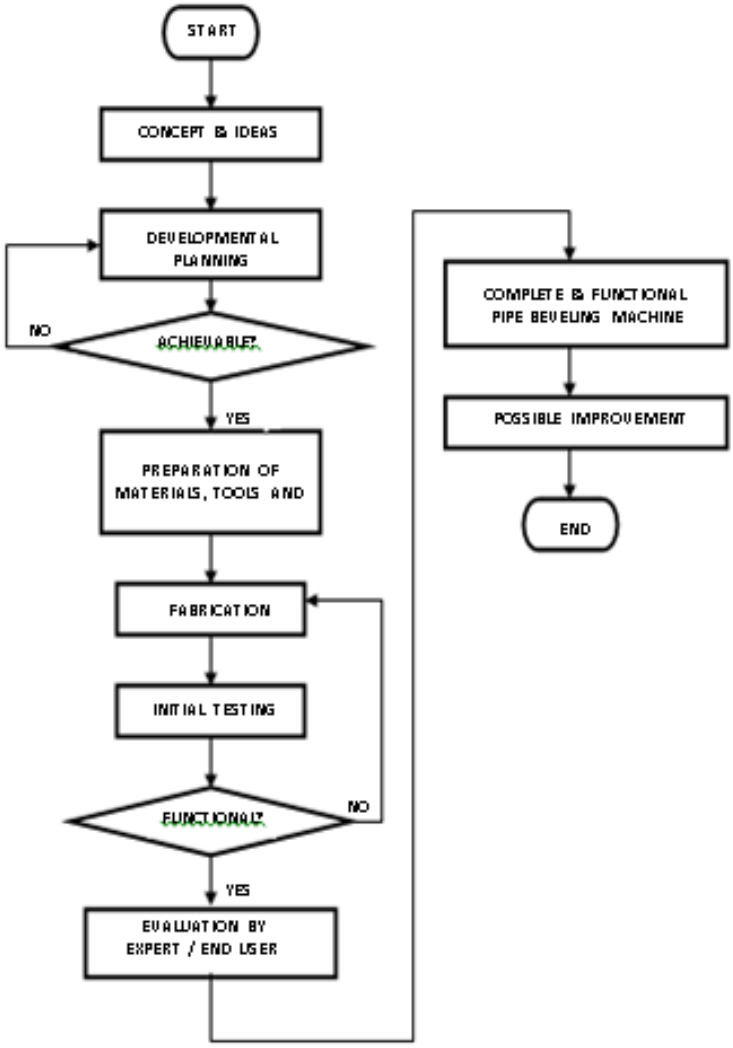

Figure 13. Conceptual Process

2. Materials and Methods

Table 1 shows the time consumed in the development and fabrication of one (1) unit of Pipe beveling machine.

Table 1. *Time Consumed for the Development of Pipe Beveling Machine*

Conceptualization	4 weeks
Planning and development	3 weeks
Material Preparation	2 weeks
Machining and Cutting	5 weeks
Assembly and Finishing	1 week
Testing and Evaluation	2 weeks
Total Number of Weeks	**17 weeks**

Cost of Production. Because the researchers decided to use the locally available materials found in the Machine shop laboratory, no material costing was listed to fabricate the pipe beveling machine. The complete bill and supply of materials are shown in Table 2.

Table 2. *Bill and Supply of Materials*

Item	Unit	Description	Item	Unit	Description
1	4 pcs	Angle bar: 50mm x 50mm x 6mm X 670mm	16	1pc	BI pipe:3/4in x 202mm
2	2 pcs	Angle bar: 50mm x 50mm x 6mm X 610mm	17	1 pc	BI pipe:1/2in x 320mm
3	5 pcs	Angle bar: 50mm x 50mm x 6mm X 600mm	18	1 pc	BI pipe:3/4in x 76mm
4	1 Pc	Angle bar: 50mm x 50mm x 6mm X 1505mm	19	1 pc	1/2in ↓ Pipe x 143mm
5	2 pcs	Angle bar: 50mm x 50mm x 6mm X 1524mm	20	1 pc	Round bar: 16mm x 21mm
6	4 pcs	Angle bar: 50mm x 50mm x 6mm X 1275mm	21	2 pcs	Bolts & nut: 12mm x
7	2 pcs	Angle bar: 50mm x 50mm x 6mm X 150mm	22	1 Pc	Cap screw: 6mm x
8	6 pcs	Flat bar: 50mm x 6mm x 120mm	23	2 pcs	Bolts & nut: 16mm x
9	4 pcs	Flat bar: 50mm x 10mm x 127mm	24	1 pc	Wing nut: 10mm x 20mm
10	4 pcs	Angle bar: 50mm x 50mm x 3mm X 280mm	25	1 pc	Square bar: 25mm x 25mm
11	5 pcs	Round bar: 50mm ↓ x 10mm	26	2 pcs	Sanding disc: inch
12	4 pcs	Round bar: 6mm ↓ x 94mm	27	2 kilos	Electrodes: 6013, 3.2mm ↓
13	4 pcs	Round bar: 6mm ↓ x 14mm	28	1 pint	Paint: red lead primer
14	4 pcs	Flat bar: 50mm x 10mm x 50mm	29	1 pint	Paint: acrylic blue/ yellow
15	4 pcs	Flat bar 50mm x 3.2mm x 50mm	30	1pc	Hacksaw blade

Tools, Equipment, and Machine Tools used to fabricate a Pipe Beveling Machine. The following tools, equipment, and machine tools were utilized in fabricating the pipe beveling machine: Steel rule**,** Push-pull rule, Try square, Scriber, Hacksaw, Ball peen hammer, Chipping hammer, Steel brush, Open wrench, Portable grinder, Bench grinder, C-clamp, Electric arc welding machine, Welding helmet, and Welding gloves.

Initial Testing. After fabrication, the proponent conducted testing. While testing its workability, some problems were encountered by the proponent. This includes the tool holder being unstable, the tool vibrating, and the tool guide is also unstable because the tool lock cannot hold firmly. Some modifications to the machine were made, such as redesigning of the tool holder. The tool guide lock replaced with a nut, and using an open wrench to tighten the nut. After some modification, the proponent conducted another test, and it was found that the previsions defects were remedied and ready for the final evaluation.

Evaluation Procedure. A qualitative survey by the experts and students was done to find out the usefulness and capability of the Pipe Beveling Machine. In the testing and evaluation of the acceptability of the device, a set of criteria were formulated, which can be rated on a scale of one (1) to five (5) with a descriptive rating of poor, fair, good, very good, and excellent, respectively.

The evaluators were composed of 35 panels BSMarE students, were all Taking Machine Shop 3, Marine engineer, and welding fabricators that has experience in Welding Fabrication and repair, five (5) Marine Engineering Instructors/fabricators, 30 BSMarE students, who are presently taking Mach 3 (Welding Processes).

Before evaluation, a demonstration of the usage and operation of the device was presented to the panel of evaluators. Its limitation was also discussed. After that, each evaluator was requested to try manipulating the device during pipe cutting, for them to feel and decide the appropriate rating.

The result of the evaluation was tabulated, and the means were computed. The computed mean in each criterion shows an awe-inspiring and conclusive it will be.

3. Results

Project Development. Through experience in machine shop technology, the researchers found out that pipe bevel cutting requires skills, especially when it comes to manual pipe beveling cutting processes. The researchers were inspired to develop a pipe beveling machine to minimize time and to get the proper angle of the pipe bevels, using a pipe beveling machine with an adjustable cutting torch holder for Unitor, cutting torch attachment, that can be adjusted to different angles and accommodate different pipe sizes (2inches to 4 inches diameter steel pipe), with a pipe support system to facilitate smooth pipe rotation during a pipe beveling processes. In addition, relevant information and professional advice were solicited from skilled machinists and welding fabricators.

Design A. Figure 14 shows the initial design of the portable pipe beveling machine, which is used in pipe beveling processes. The isometric drawing shows a series of gears, sprockets, chains and crank rotators. The design is portable and manually operated, in which the cutting torch is the one that rotates through the pipe, and it can accommodate a longer pipe lengths. Neverthless, due to the unavailability of the gear cutting tools for gear fabrication, the researchers decided to change the design.

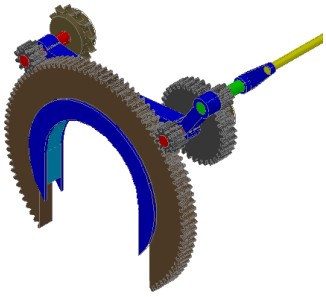

Figure 14. *Design A of Pipe Beveling Machine*

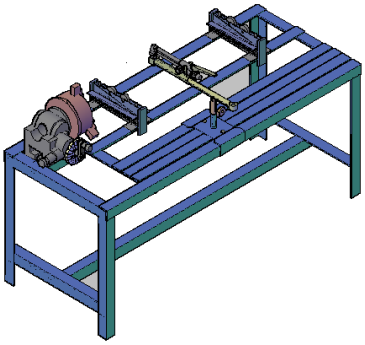

Figure 15. *Design B*

Design B. Design B (Shown in Fig.15) was developed for the simplicity of the design. Although, it is not portable and heavy compared to design A, the fabrication cost is low compared to the initial design, because the researchers decided to use the dividing head of the milling machine as a pipe holder and rotator. It has a similar function to the first design. Figure 15 shows a 3D view of design B. It is composed of 4 major parts, namely a Pipe rotator, cutting torch holder assembly, pipe support assembly, and work table. The milling machine dividing head will serve as the pipe rotator to maximize its use asides for gear cutting operation in the machine, which is seldom because of limited time in Mach 2 and due to the revised course outcome.

Table 3 shows the mean(x) ratings of the evaluators on the acceptability of pipe beveling machine.

As shown in Table 3, the mean (x) in each criterion is above four (4) which denotes an excellent rating. Collating all these data results attest to the acceptability of the device with an overall mean rating of 4.76, which falls within the excellent range.

Table 3. *Acceptability of Pipe Beveling Machine*

Criteria	Particulars	Mean (X)	Descriptive Rating
1. Precision	1.1The device can cut the desired pipe bevel angle. 1.2 Quality of pipe cut	4.71	Excellent
2. User Friendliness	2.1 Easy to assemble 2.2 Easy to set/ operate/ maintain	4.54	Excellent
3. Stability	3.1 The fixture and other adjustable parts remain in proper position during pipe beveling processes.	4.86	Excellent
4. Safety	4.1 The pipe can be safely rotate and cut during pipe beveling cutting.	4.8	Excellent
5. Physical Features	5.1 The cutting torch holder is well fitted and easily adjusted to the desires angle and length 5.2 The pipe rotator can be easily rotated 5.3 The pipe support assembly can be easily adjusted to accommodate and supports different pipe diameters and length 5.4 The cutting torch can be easily and rigidly attached in the holder	4.76	Excellent
Overall Mean		4.76	Excellent

Legend: 4.51 – 5.0 Excellent; 3.51 – 4.50 Very Good; 2.51 – 3.50 Good; 1.51 – 2.50 Fair; 1.0 – 1.50 Poor

4. Conclusions and Recommendations

The following presents the summary of findings, conclusion and recommendations of the project study based on the evaluation results, remarks and suggestions given by the panel of evaluators.

Summary of Findings. During the initial testing, some piece part was not working to their optimum. The proponents were prompted to modify the defective ones. After that, another test was made, this time, it was found to be working as planned. Then it was subjected to a final evaluation, in which some suggestions and recommendations were given by the panel of evaluators. However, they signified that the device is handy and easy to use. Also, they have agreed that it benefits welding students, trainers in BSMarE. Moreover, to small and medium industries engage in welding jobs.

Conclusion. Based on the results of the evaluation of 35 respondents, the following conclusions were derived.

1. The Pipe Bevelling Machine, in terms of precision, user-friendliness, stability, safety and physical features, were very acceptable.
2. The device is convenient and easy to use; it minimizes time and effort in pipe beveling preparations.
3. Enables the teacher/ instructors in imparting the skills accurately.

Recommendation. Implications of the conclusions led to the following recommendations:

1. The device should be subjected to further evaluation by a more significant member of evaluators.
2. Provisions for a motor drive of the machine for much precise and better-finished cut and easy control and manipulation.
3. Put provision on the machine for hot spark collectors for the operator's safety..
4. Mass production of the unit should be initiated at a very affordable cost, for schools, and training institutions engaged in machining jobs or mechanical trade.

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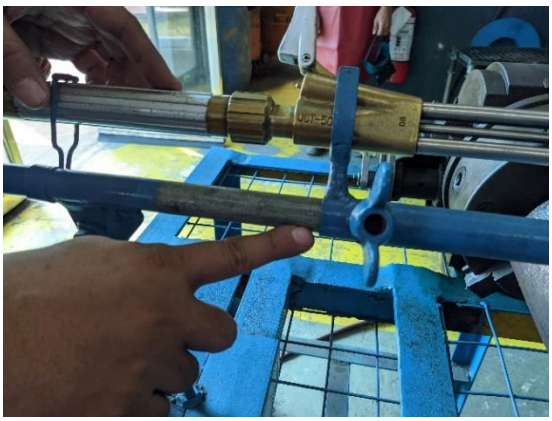
And above all, to God Almighty, for the answered prayers, strength and wisdom that He bestowed upon us. Thank you.

7. Appendix - Operating Procedure of Pipe Beveling Machine

1. Set the required working pressure for both Acetylene (0.2 bar) and Oxygen (1.7 bar) for Gas Cutting Operation;

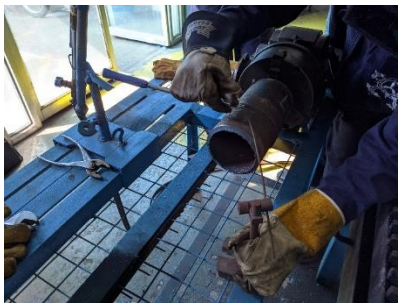
2. Assemble the Cutting Torch on the Cutting Torch Handle.

3. Set the Cutting Torch to 30 degrees angle

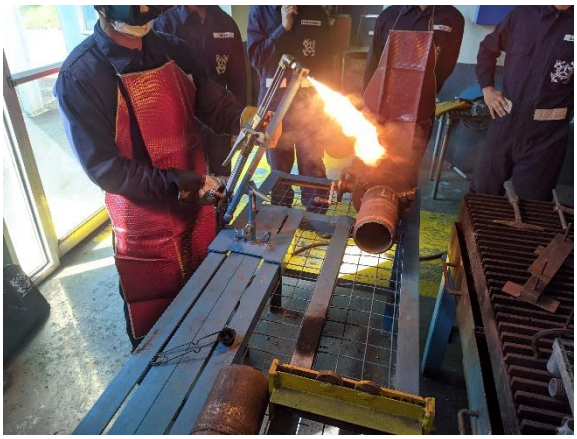


4. Load the work piece into the pipe holder

5. Center the workpiece and mark the length to be cut

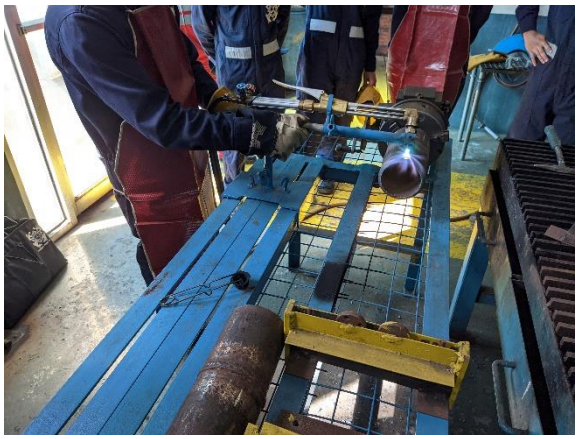


6. Open the Acetylene needle valve at least one turn, then using the Gas Ignitor, ignite the flame



7. Gradually adjust the oxygen needle valve to set the necessary flame setting

8. Position the Cutting Torch Holder near the workpiece



9. Preheat the workpiece by turning the dividing head index crank.

10. Set the starting point by concentrating the flame on the workpiece until it turns cherry red

11. Press the oxygen lever to start the cutting process, then lock the lever

12. Turn the index crank slowly to begin the cutting process, wait until the workpiece is entirely cut

13. Depress the oxygen lever when it reaches the end of the cut

14. Move away from the Cutting Torch, immediately close the Acetylene needle valve, followed by the oxygen needle valve

15. Cool down the workpiece, the check the Bevel cut of the workpiece. Secure the equipment

Developing Guidelines for Audiovisual Presentation: Inputs for Standardized MAAP LMS Multi-Media Materials

***Research Priority Area*: Maritime Education - LMS/ICT/Digital Education in MET**

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ABSTRACT

In 2018, the Maritime Academy of Asia and the Pacific started the MAAP LMS Project. Four years from its conception, the Academy and the Instructional Development Office aimed to develop standardized Instructional Materials, specifically audiovisual presentations. This research is a literature review survey that led to the formulation of Guidelines for Audiovisual Presentations, mainly videos and multimedia compositions that formed part of Learning Modules designed for the MAAP LMS Platform. The study analyzed scholarly material from film production, photography, advertising, digital media, and copyright. The guideline aimed to standardize all multimedia content owned and utilized as Instructional Material by the Academics Department of the Maritime Academy of Asia and the Pacific, accessible through the MAAP LMS. The Guideline covered salient aspects of multimedia production and specifications for audiovisual material, usage of a proprietorship emblem, aesthetics for subtitles and annotations, perspective view to photo and video subject, use of avatars and presenters, citations and acknowledgments; authorship and copyright procedures. The guideline is seminal as a response to copyright policies imposed by various audio-video hosting web services and in accordance with ISO 21001.

KEYWORDS: *Encoding, Film and Photography, Instructional Material, Learning Management System, Multi-Media Devices*

1. Introduction

The Maritime Academy of Asia and the Pacific (MAAP) envisions itself as the leading institution of excellence in Maritime Education and Training by providing students with quality education and training curricula to produce competent graduates. Thus, its program offerings incorporated a new system to deliver educational courses and training programs, academic reporting, documentation, and student tracking.

MAAP LMS serves primarily as a repository of various instructional media and a platform to conduct synchronous and asynchronous classroom instructions. The use of LMS and various teaching modalities and strategies proved to be effective and were able to improve the academic performance of BSMT and BSMarE Students in the Maritime Academy of Asia and the Pacific (Angeles et al., 2018; Galang et al., 2019; Yutiga et al., 2019).

Course Contents developed for the MAAP LMS integrate various multimedia materials- still photographs, infographics, slide shows, audio files, video files, and electronic documents. This improved student engagement, addressing multi-level student learning ability and preferences (Koenig, 1999; Lee, 2009).

However, this posed a challenge in the course creation process as multimedia material comes in various electronic formats. Each format required specific rendering and treatment to be compatible with the MAAP LMS Platform.

Additionally, students use different devices to access the LMS Course Modules. These devices are either provided, lent, or brought for/by the students, thus posing another challenge in media compatibility and device optimization.

Consequently, multimedia material is acquired predominantly from the internet, wherein the course content authors and collaborators are constantly mindful of possible copyright infringement and untoward plagiarism due to stringent policies being imposed by web hosting services that limit the use of multimedia material to their specific service and web address.

Furthermore, ISO 21001 requires policies regarding Management Systems in Educational Organization, particularly Chapter 8.5 Delivery of the educational Products and Services, which requires "control of delivery and changes" to educational products and services.

The Instructional Department Office of the Academy released the "Guideline for Audiovisual Presentations," wherein some items were referenced from Capital University and the University of Leicester's PowerPoint Guidelines.

Following this guideline, the researcher devised specifications that homogenized all audiovisual materials uploaded to the MAAP LMS Platform.

Specifically, the researcher addressed the following questions:

1. What standard should be applied to Audio Visual Material in terms of: (a) Resolution, (b) Rendering, and (c) Device Optimization?
2. What should signify proprietorship of Multimedia material?
3. How should subtitles and annotations be applied to multimedia materials?
4. What is the appropriate perspective projection for still images and video subjects?
5. How should avatars or presenters appear in audiovisual materials?
6. How should citations and acknowledgment appear in audiovisual presentations?

2. Methods

The study's design analyzes scholarly material related to film production, photography, advertising, digital media, and copyright, as well as end-user experiences from various instructional platforms and facilities.

3. Results and Discussions

MAAP LMS is a web-based platform using a local storage server and is accessible through the intranet. The following entails standards deemed most appropriate for the following:

Audio-Video Materials

a. in a 480p Standard Resolution. This means that it has 720 pixels horizontally and 480 pixels vertically.

The primary benefit of 480p is that progressive scan recording allows increased vertical resolution and it significantly reduces interlace motion and detail artifacts; 60 progressive frames are recorded per second, resulting in a sharper image with less motion blur than interlace; and 480p allows the use of existing NTSC support equipment and infrastructure during both field and post-production. (Salgado 2001).

Furthermore, the higher resolution will cause a larger file size, thus affecting the capacity of the LMS storage server. A cramped storage server will cause a delay in data uploads and downloads. Figure 1 shows a comparison of images in various resolutions.

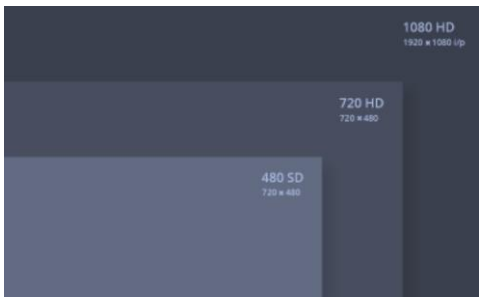


Fig. 1. *Image Resolution Comparison*

b. optimized for mobile devices such as tablets and notebooks.

Mobile devices tend to gain more popularity among adult learners due to their portability, versatility, and minimal power requirement (Nair, 2016).

Moreover, Caintic et al., 2019 reported a 67% preference for mobile devices such as notebooks and tablets among BSMT and BSMarE students. Furthermore, IMAAJ-sponsored students were provided with IOS devices in October 2019; The Academy consequently provides android devices in the CSGO Campus for study periods outside academic hours.

c. in MP4 format, encoded thru H. 264, Advanced Video Coding, also known as MPEG4-part 10.

Composite videos are rendered in a variety of file formats. For example, MP4 is a file format created by the Moving Picture Experts Group (MPEG) as a multimedia container format designed to store audiovisual data. The MP4 video format is one of the most popular for online use because it

compresses high-quality videos into a relatively small size. All the major sharing platforms support MP4 and are widely accepted by various editing software and offline programs (Soffar, 2020).

Video coding is the process of compressing and decompressing a digital video signal. H. 264, Advanced Video Coding, also known as MPEG4-part 10, is designed to facilitate video transport over IP networks and provides a substantial compression ratio (Richardson, 2010). As a result, H. 264 provides high-quality transmission of full-motion video with lower bandwidth and latency than traditional video standards.

Proprietorship Emblem. The MAAP Logo will be used as a proprietorship emblem and embedded in each video frame. Embedding the mark in the background will hinder attempts to tamper and eliminate the Academy logo, thus restricting reproduction and distribution.

The emblem will be rendered as a watermark with three percent opacity, positioned in the center of the frame with an 85% frame ratio, as shown in Figure 2.

Fig. 2. *Still video frame with MAAP Watermark.*

Subtitles and Annotation

a. Subtitles should use standard film grade placement, 1⁄72 of a system-scaled inch.

The standard point size used in most modern computer programs (known as the desktop publishing point or PostScript point) has 1 pt equal to approximately 0. An inch equals 72 points, so the primary conversion ratio for font size into inches is 1 point equals 1/72 inch and will vary depending on the viewing distance and viewing angle. Gregor Franken et al. (2014) found only a 1.5% reading speed difference for x-heights from 0.3° to 0.46°. Rello et al. (2016) also saw little change for sizes between 18pt and 26pt (0.3° and 0.43°).

b. Subtitles should be floating texts with no background using Helvetica Medium Condensed NOB Latin 46A font, with a drop shadow outline as shown in Figure 3.

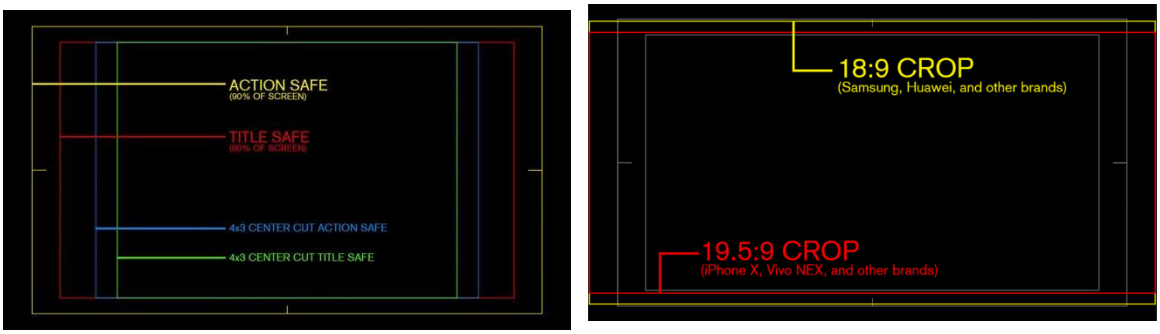
Fig. 3. *Subtitle in Helvetica Font*

The goal of using a subtitle is to make the content more accessible for the user to understand. Sydney Language Solutions, an online language school, based in Australia, recommends using the font due to the typeface uniformity and simple design. The other option is the use of Arial Narrow.

c. Subtitles should be embedded, with no option to disable them. Texts should be limited to a maximum of 38 characters per line; if wide letters such as M and W occur frequently, then limit to 34 for that line to stay within the safe text area.

According to the British Broadcasting Corporation Online Academy, good subtitles convey as much of the experience of watching with sound to the viewer. The text needs to be readable, match the dialogue as closely as possible, be well timed and not obscure essential parts of the video. Subsequently, subtitles or closed captions help individuals with hearing impairment or if using audio is causing inconvenience due to prolonged usage or when the viewer prefers to play videos without sound.

Furthermore, BBC recommends placing subtitles or closed captioning in title-safe areas. The first and last safe line defines the safe areas in a vertical direction and the first and last safe pixel in a horizontal direction. In addition, the total number of lines (vertical) and pixels (horizontal) which are within the safe areas are given (EBU R95, 2017). Figure 4 shows safe areas specific to television and mobile devices.



Safe areas for Television Safe areas for Mobile Devices

Fig. 4. *Safe areas for Television and Mobile Devices*

Annotations

a. Annotations/narrations should be in Male Voice and Neutral Accent, US English. Leading industries in audiobooks and other narrated media prefer to hire male voice actors predominantly because of the cost of production. Hiring several voice actors to voice over specific characters proved costly and impractical (Jones, 2003). End users also prefer male voices when dealing with scientific or instructional material that demands authority. "On average, both males and females trust male voices more," said Clifford Nass, a professor of communications at Stanford, noting that some gender disparity exists in that women do not distrust female voices as much as men distrust them.

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However, industries that employ virtual assistants tend to lean on using female voices, such as mobile phones and routing devices. Casting female voices may be rooted in biology as the female voice is associated with motherhood and is perceived as more pleasant. (Griggs, 2011).

The historical affinity of the Philippines to the United States of America, and their language, dates back to 1889 after Spain seceded in the Battle of Manila. In 1901, the Thomasites were sent to the Philippines to establish a new, highly centralized public school system, to teach primary education and to train Filipino teachers using English as the medium of instruction (UK Essays, 2018).

b. Toggle control to enable/disable annotations/narrations should be provided. This option is dependent on user preference. No hard evidence suggests why end-users opt-out out of disabled narrations. However, consumers often question computer industries like Microsoft on how to disable narrator functions as soon as the technology is made available. This is confirmed by Google Trends, as the number of searches about disabling narrations peaked coincidentally when narrator functions were launched to the public, as shown in Figure 5.

February 2019-February 2020

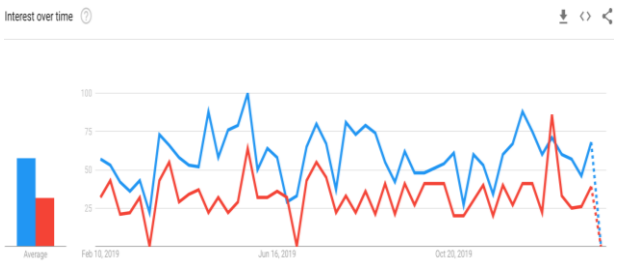

Fig. 5. *Google Trends Search Results*

Perspective View of Image Subject

a. It should be shown in isometric, third quadrant view, or if necessary, in isometric projection, as shown in Figure 6.

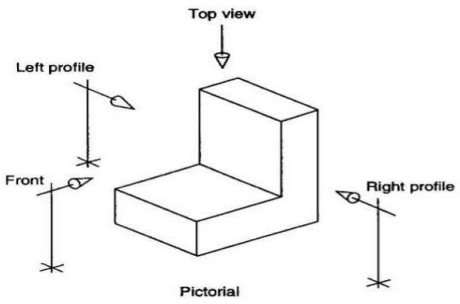

Fig. 6. *Isometric Projection*

In an isometric projection, the plane is placed so that all three visible sides of the object make the same angle. In this way, all the three sides meet at a point, making an angle of 120° with one another. (Abdullahi, 2019)

b. Images should cover at most 2/3 per frame.

c. Images should be placed on the left-hand panel of the frame, using the rule of thirds, as shown in Figure 7.

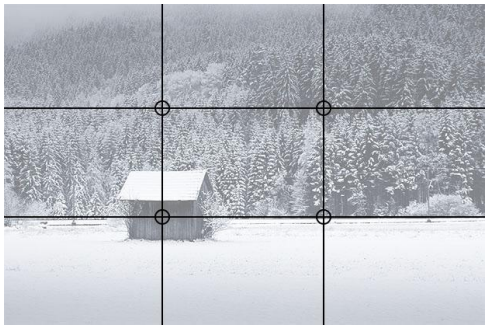

Fig. 7. *Framing and Rule of Thirds*

As a rule of thumb in photography, the rule of thirds divides the image into nine equal segments by two vertical and two horizontal lines. The subject is placed on points where the lines intersect. This method balances still images and is more engaging (Rowse, 2018). The technique also provides an ample amount of background space for closed captions.

d. Images should have full lighting, with no visible shadows or gradients that may distort or obscure parts of the device or equipment being portrayed as shown in Figure 8.

Fig. 8. *Details of Equipment in still photography*

According to David Lynch, a Film and Creativity Educator, "lighting is fundamental to film and photography as it creates a visual mood, atmosphere, and a sense of meaning for the audience ."The type of lighting setup guides the eye to a specific actor, prop, or part of a scene. High-key lighting is lighting aesthetic with no shadows and intense brightness, bordering on overexposure. This lighting technique uses a 1:1 ratio when a subject is evenly lit on both sides, resulting in images with minimal or no shadows (Wayand, 2016).

e. Brand names of devices or equipment should be blurred out or intentionally omitted.

In various media types, brand names, corporate logos, and company insignia are reserved for product placement and advertising (Nuri, 2020). MAAP and the MAAP LMS are non-profit educational organizations and, thus, do not necessarily promote or advertise specific products or services for monetary gain.

Product placement is a form of advertising in which branded goods and services are featured in a video production that targets a large audience. In exchange for product placement rights, companies may pay a production company or studio in cash, goods, or services (Kenton, 2018).

The intended end user of the audio-visual material are students of the Maritime Academy of Asia and the Pacific. Advertising in schools and to students is a largely debated topic among industry experts and policymakers (Aidman,1995; Brown, 2015; White, 2018).

Avatar and Presenter

a. Annotated/narrated texts with no accompanying imagery or visual aid should have an avatar/presenter.
b. Avatar/presenter should be rendered half-body and take at most 2/3 of the frame, as shown in Figure 9.

Fig. 9. *Presenter in Video Frame*

An avatar is used to represent a non-visual concept or idea. The use of Avatar in digital media originated in the 1990s as a visual cue instead of an actual presenter or spokesperson (Lu, 2018). Avatars are more cost-efficient in production and can be rendered in various forms, such as animations, text-to-speech (computer) voice-overs, and lip synchronization, whereas spokespersons require a script, a talent, person-hours, and post production services (Eeken, 2018). Rendering of either avatar or presenter on the video frame follows that the rule of thirds applies to photography and safe spaces for closed captioning.

a. The avatar/presenter will be in plain, smart casual attire with no identifying logo or brand name in the article of clothing.

Reiterating guidelines for unintentional product placement and advertising, the choice for presenters or spokespersons to appear in plain, brandless articles of clothing is preferred.

b. Depicted operation and/or manipulation of device or equipment should only show the limbs used by the operator, as shown in Figure 10.

Fig. 10. *Using a Hand Drill*

This visual treatment will ensure that attention will be drawn to the subject, in this case, the handling of a tool; when compared to a different photo or video depicting the doer in a half-body projection, as shown in Figure 11, attention may be deviated from the intended subject of the imagery despite of closed captioning.

Fig. 11. *Using a Hand Drill*

In Cinematography and Photography, this treatment is called the focus. An object in focus has a sharp and well-defined image. Focus is mainly affected by the lens of the camera, the projector, and the viewer's eye. (Brooklyn Film Academy, 2005; Cox, 2019). For example, the focus in Figure 10 draws the viewer's attention to the subject because everything else falls as background. A more comprehensive background provides adequate safe spaces for texts, as stipulated in the guideline for subtitles.

Authorship and Copyright

a. Audiovisual presentations should use rolling end credits for authorship credits, citations and acknowledgements.
b. Rolling end credits should include names of all key personnel, groups, or departments responsible for the conceptualization, production, editing, and publishing of original audiovisual content, with respective functions.
c. Acknowledgment should indicate names of personnel, groups, or departments who/ that contributed to the conceptualization, production, editing, and publishing of original audiovisual content, with respective functions/contributions.
d. Materials from other sources, i.e., public domain websites and articles, should be properly cited and included in the rolling end credits.

Rolling credits aims to publicly acknowledge the personnel who contributed in the production of the audiovisual work (Shor, 2019). Citation, on the other hand, show readers/viewers that certain material in a scholarly work came from other sources. It also gives the audience the information necessary to find that source (Plagiarism.org, 2019)

Implementing such in every frame of the audio-visual presentation will create clutter and will reduce safe spaces allotted for subtitles. Using end credits minimizes the risk for plagiarism and maximizes frame spaces for video or photo subjects, as well as subtitles.

e. The phrase “All rights reserved” should be indicated in the rolling end credits.
f. Copyright for the audiovisual presentation should be secured by the Academy.
g. The “MAAP LMS” logo should appear at the end of the rolling credits.

Copyright refers to the legal right of the owner of intellectual property. This means that the original creators of products and anyone they give authorization to are the only ones with the exclusive right to reproduce the work. (Kenton, 2020). Exclusive rights to the audiovisual presentation secure ownership of the material to the Academy. This prevents illegal distribution, public exhibition, and unauthorized use in general.

Moreover, exclusive rights to the material conforms with ISO 21001 standard, in terms of retention of documented information on the release of products and services, control and documentation of changes, with limited or no interference from entities or parties outside of the Academic Organization.

5. Conclusions and Recommendation

The specifications in this guideline is seminal for the Academy and requires further study and pilot testing. However, due to the absence of any standard currently imposed by the Institution, the guideline may be adopted as a standard for every instructional and education material until a policy is implemented.

Consequently, qualified personnel are required to handle and execute the production, edition, publication, and continuous revision of the original multimedia and audiovisual material in order to guarantee its relevance to current trends and regulations. The researcher also recommends the acquisition of necessary equipment, software, and facility in order to produce its own audiovisual material.

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Impact of MAAP Library Promotional Tools on Library Customers Behavior

***Research Priority Area*: Enrichment of Student Life**

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ABSTRACT

Library promotion is not new to the system of any library. The goal of every library is for the patrons to maximize the utilization of resources and services that it offers. Various library promotional tools have been used by the MAAP library team, from print to online, to inform and persuade the customers to avail the existing or new library resources, services, and programs. This study aims to determine the best marketing tool to reach out to the patrons and its impact on their behavior towards the library, thus a basis for future promotional strategies of the library. A descriptive method using a self-made online questionnaire was validated and used to gather and analyze data from a sample population of 266 students and 77 faculty members for the 1st semester AY 2020-2021 during the onset of the COVID-19 pandemic. Findings show that email was the most preferred and popular marketing tool for the students and faculty. Promotional tools have significantly impacted them by increasing their awareness of what the library offers in the community. Lack of time and internet connection issues are why library marketing tools have no impact on some. In conclusion, email is widely used in the academy and must maximize its usage as a marketing tool. Other marketing tools should be updated with content and regularly promoted to enhance library customers' knowledge of library promotions and reach a larger demographic of potential customers. The library could also explore other online platforms which they think will be more engaging to the target customers.

KEYWORDS: *Library 4.0, Library Marketing Channels, Online Marketing, Library Patron Behavior*

1. Introduction

Library promotion is not new to the system of any library. The goal of every library is for its customers to maximize the utilization of resources and services that it offers. Customers are influenced by marketing, as Mandrekar and Carvalho e Rodrigues (2020) point out: to raise awareness of the library's services and resources, to build an online demand, to meet customers' needs by delivering online information, and to enhance learning and reading habits. It provides an opportunity to assess the customers' behavior in getting information and availing of the library's services. Also, it provides means for improving customer satisfaction. Various promotional tools have been used by the MAAP library, from print to online, to inform and persuade the customers in availing of the existing or new library resources, services, and programs. Using both print and online mediums to diversify the marketing mix and one crucial fact is the growing usage of online mediums (Vinaya and Mehrotra, 2018). Since library customers have varied preferences in getting updates, the library team used to print and online marketing tools to attract their attention. These marketing tools which the library had tried to use are tarpaulins, newsletters, brochures, pathfinders, infographics which are posted in the library social media, library tv, library website and sent through email and posted per department's bulletin board.

Nowadays, the engagement people have with online media makes one reconsider how advertisements delivered through different marketing tools influence their perspective (Vinaya and Mehrotra, 2018). Mandrekar and Carvalho e Rrodigues (2020) said that traditional approaches of libraries are no longer sufficient and need to adapt to trends by shifting their focus on online promotional tools. To better serve the library customers, the library team aims to understand their preferences in reaching out to them. Due to the changes brought by the pandemic, the library focused its marketing strategies on online tools in reaching out to the customers in a new normal approach.

There was a lot of marketing research on libraries. Still, only a few considered the preferences of the library patrons, as discovered by M. Jones & M. Harvey (2019) in their study. Most research focused on the impact of library marketing on the services and resources of the library, and only a few studied the impact of the marketing tools on the customers' perspective; thus, this research wants to address this. Therefore, this study aims to determine the following :

1. Which promotional tools are the customers fully aware that the library has?
2. What is the most preferred promotional tool by library customers?
3. Which current library promotional tools persuade the customers to avail of the library resources and services?
4. What are the impact/s of the current library promotional tools on the customers' behavior?
5. Based on the result, what innovations will the library do in promoting the library through its promotional tools?

Theoretical Framework. Marketing refers to the promotion of products or services. Marketing examples are advertising, selling, and delivering things to consumers or other businesses (Twin, 2021). Resources, services, and information are the products promoted in libraries. Unlike commercial companies, which are into profit, the library aims for higher customer satisfaction with its services.

Libraries should be willing to meet users where they are, both physically and online, by adapting programs to their needs. Knowing those things also necessitates a strong commitment to communicating to them, including establishing a two-way communication channel, employing numerous communication channels, and utilizing a feedback loop that allows programs to advance as user demands change (Higgins 2017).

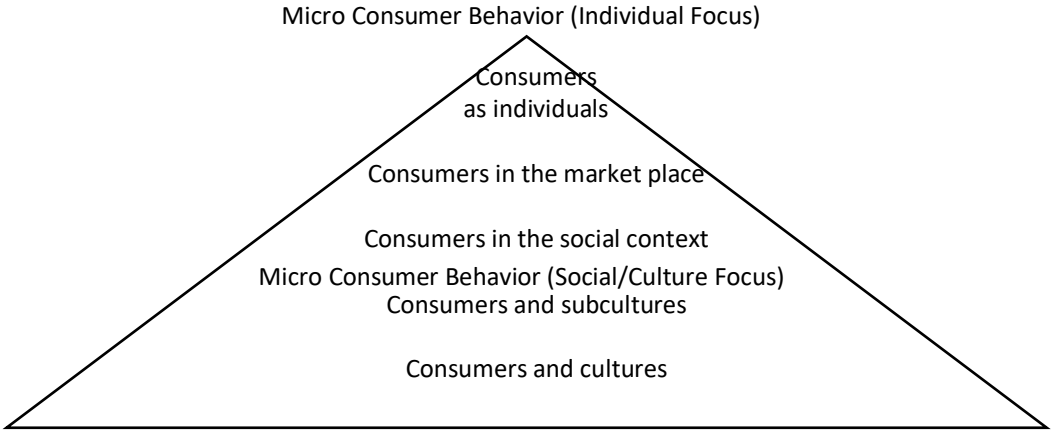
According to Koekemoer (2014), as cited by Kovanoviene, V. et al. (2019), the library promotes itself using print materials such as bulletins, newsletters, and brochures. Still, with the advancement of technology, marketing has shifted to internet channels. Through online marketing tools such as social media, library websites, and online orientations, libraries could engage with customers, disseminate information, and advertise quickly and interactively.

Constantinides (2014), as also cited by Kovanoviene et al. (2019), said that social media could be a passive method used to assess customer behavior based on external factors. It can also be an active approach in which it is used for direct marketing to modify products based on customer preferences. Social media has advantages for communication and promotion.

As defined in the study of Kovanoviene et al. (2019), consumer behavior encompasses people's thoughts and feelings and the activities they take during the consumption process. It also contains everything in the environment that impacts these ideas, feelings, and actions.

Let's take a look at Vinaya and Mehrotra's (2018) study, in which they determined the distinctions between print and online advertising and how they affect customers' buying behavior. They tried to figure out which medium is more effective in today's world. Every medium has its advantages and disadvantages Based on the result of the study, a single advertisement on online marketing tools can reach geographically diverse customers, which becomes the limit of promotion in printed marketing tools. Customers will most likely be kept up to date quickly to online marketing techniques. However, most people spend less time exploring the web, making it difficult for advertisements to capture their attention. This behavior contrasts with a printed marketing tool, where customers spend several minutes reading, giving advertisements more time to connect with customers and influence their decision. Another factor mentioned is the presentation of the advertisements to the reader. Studies find that in online advertisements, higher intrusiveness leads to avoidance. This case demonstrates that intrusive marketing on the internet can have a negative impact on client behavior, which in return makes the advertisement ignored. This situation indicates that the length of time customers spend reading online and in print and the display of ads on various marketing platforms impacts their decisions.

As a result, the library should consider the preferred promotional tools of the customers to be used in advertising to make the marketing strategy effective.



Source: Kimmel (2018), as cited in Kovanoviene, V. et al. (2020)

Figure 1. *Pyramid of Macro and Micro Consumer Behavior*

As seen in the diagram, consumers are dominant in both the micro and macro environments. Consumers are treated as individuals in the microenvironment while linked to culture in the macro-environment (Kovanoviene, V. et al., 2020).

Micro and macro factors influence consumer behavior on how they make purchasing decisions. As a result, the marketer's job is to determine how to increase a consumer's willingness to follow through on a purchase choice (Kovanoviene, V. et al., 2020). The library management must consider and understand the customers' preferences marketing medium in promoting the library. Libraries must make the most of the marketing tools that most of their clients use frequently and like. According to the model's explanation, customers' individual preferences fall under micro. Still, societal and cultural choices, which we put under macro, may influence his decision to use a library service, borrow materials, or join an activity or program.

Shout (2016) clearly explained some promotion impacts on consumer buying behavior. Libraries are still adopting some business concepts to promote the products of the library even though the library is nonprofit. Among the marketing promotions mentioned by Shout, sales promotions apply to the library setting. He found that customers are more attracted to promoted products than those on displays. Focusing on the promoting occasion is one strategy that Shout mentions to increase the number of customers. This result implies that libraries should strategically connect or apply some current topics or trends in the society in coming up with promotional designs messages suited to promotional tools to catch the customers' interest. Promotion influences customer behavior by introducing new products and targeting customers without any experience with them.

Active marketing is an essential component in promoting libraries and assisting customers in becoming more aware of and using library resources and services. It is the responsibility of library personnel to choose the appropriate marketing tool for informing the community about the library's resources, services, and other information. (Aslam, 2018). Librarians need to understand their patrons and how to reach them. According to Solomon et al. (2016), as cited by Kovanoviene et al. (2019), consumer behavior is how individuals or groups purchase, utilize, or dispose of items, services, ideas, or ideas experiences to meet their wants or desires. In library marketing advertisements, it is the consumer's ideas, feelings, and actions. Personal preferences and the social environment can influence library patrons' willingness to engage with library marketing platforms. In addition, Kovanoviene et al. (2019) explained that consumer behavior is determined by different factors which affect their decision in acquiring a product or service. As a result, the library's mission is to figure out how to increase consumers' willingness to act on their decision to use the library's resources and services. Aslam (2018) cites Campbhell and Gibson (2005), who state that evaluating marketing results is essential for expressing a library's worth and importance and assessing a program's efficiency. According to Hallmark et al. (2007), as cited by Aslam (2018), measuring the success of each marketing component allows ineffective ones to be removed or improved and successful ones to be expanded.
In today's electronic environment, the value of having access to information is more significant than having physical space (Nooshinfard, 2011). People become more dependent on the internet in gathering news and other information, especially during this covid-19 pandemic. The library needs to blend in with the academy turning into online classes. It needs to reach out to the community using different online platforms to support their academic and research needs. According to Vinaya and Mehrotra (2018), online marketing tools are more effective than printed ones since they are more engaging and have a higher probability of being remembered. Customers prefer printed marketing tools over online because they find them more convincing and appealing. Overall, respondents were more affected by online advertisements than by printed ads when making purchasing decisions. This result concludes that the library must focus on popular marketing tools and consider the preference of its customers. Online tools are getting more popular, while print tools can increase the credibility of the advertisement. Though there are plenty of popular online marketing tools, attracting attention

to a virtual environment is challenging because there is no mutual communication between customers and librarians. Words, visuals, information, and a prompt response are the only ways to gain users' attention and confidence (Nooshinfard and Ziaei, 2011). Though challenging, MU (2007), as stated in Mandrekar and Carvalho e Rodrigues' (2020) study, libraries should provide a comfortable interaction environment so that users can feel free to ask questions. According to Arumugam and Balasubramani (2019), online marketing tools such as social media have a significant impact on accessing the current needs of the user community and are always the preferred channel for interacting with the library. Chivandi et al. (2019) said that it had become the new and attractive way to disseminate information in comprehensive coverage.

Jones and Harvey (2019) identified the benefits of social media as a constant tool used by many in their daily life, the ability to transmit messages outside of the institution, and the speed with which communications may be sent out. According to Chan (2010), cited by Alkindi and Al-Suqri (2013), advertising on Facebook pages has a greater impact on users. It became a helpful tool for announcement and library marketing. In addition, Chivandi et al. (2019) added that it is used to express opinions about products and services or get information from other users' comments. Steiner (2008), as also cited by Alkindi and Al-Suqri (2013), recommended that libraries consistently update their Facebook pages to attract and engage with customers. Marketing the library using social media allows users to see what the library is doing and how it can work alongside traditional methods rather than replacing them. It makes the library more current and relevant, providing it with a voice that emphasizes the good aspects of its work.

The library website has a significant role to users in giving access to resources and promoting the library remotely. In the study of Mandrekar and Carvalho e Rodrigues (2020), among the promotional tools used in marketing, library websites got the highest percentage (86%) on usage when it comes to reflecting the image and promoting the products of the library. In their study, Arumugam and Balasubramani (2019) discovered that the library website is the most preferred tool for accessing library resources. Yi (2016) found that library websites and social media were the most effective advertising tools, based on the high percentage of digital media strategies utilized. The library website serves as a representation of the library and facilitates information access through links and tabs.

MAAP library creates infographics and posts them on Facebook, library website, and library television. An article on *Infographics and Library Marketing* (2020) states that infographics have existed for hundreds of years. It is proven to grab attention, for people's brains are hardwired for visuals. A good infographic will trigger a reaction in the human brain, sometimes even before the person consciously realizes and processes that reaction.

In their research, M. Jones & M. Harvey (2019) discovered that based on their literature analysis, it's unsurprising that only one library considered asking the users which tools would be beneficial to them. In contrast, most studies only looked at staff members' preferences and assumptions about which social media tool would best fit the library's intended activities and which users are most likely to use. This situation shows that most research regarding the preferences of patrons when it comes to marketing tools used by the library is few. To further understand the MAAP library customers, this study included customer preference in the survey.

Another marketing tool is email. At this critical age, emails giving tips on finding information on library resources are valuable. (Mandrekar and Carvalho e Rodrigues, 2020). In their study, Fariborzi and Zahedifard (2012) looked at the effectiveness of email marketing. According to their research, sending email aims to improve client relationships, gain new consumers, and advertising. Email marketing has several advantages. Some mentioned in their study are the customization of a message that fits the customer's profile, measurability of how many emails were sent and received a response,

fast, easy to use, and less budget. There are also some disadvantages mentioned in their research: undelivered messages, consistency of engagement through time, and flooded emails.

Either online and printed marketing tools, Vinaya and Mehrotra (2018) stated in their study that published resources would not decline as supported by their readings that digital advertising works in conjunction with tv and printed materials to generate a broader market.

2. Methods

In this specific study, a descriptive or survey method was used as the primary method to gather data from a sample population of total 266 students from both Marine Engineering and Marine Transportation and a total of 77 faculty members from both College of Marine Engineering and College of Marine Transportation for the 1st semester AY2020-2021.

A self-made online questionnaire was used to collect data from the respondents. It was found reliable with 0.80 Cronbach Alpha, which has good internal consistency. Validated and distributed online to all the students and faculty corporate emails.

Further, the collected data were tabulated and analyzed. Finally, the researcher drafted a conclusion based on the study's results and proposed further studies.

3. Results

Results of the analysis of data is presented in this section.

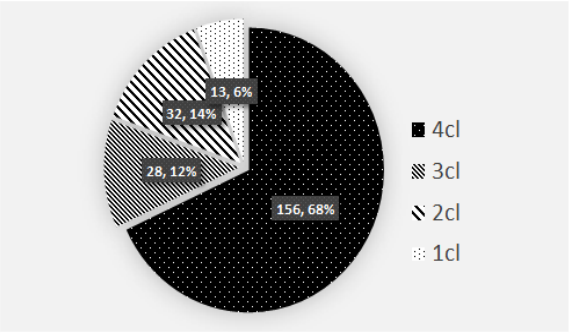


Figure 1. *Student Respondents*

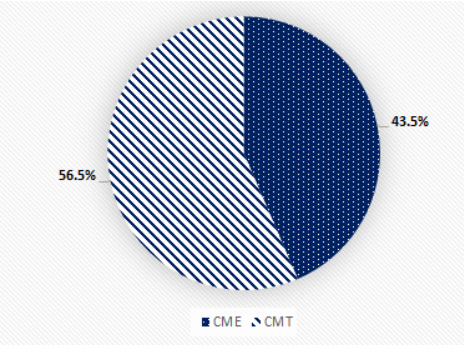


Figure 2. *Students per course*

Figure 1 shows most respondents were from the 4cl group is 68%, followed by the 2cl with 14 %, 3cl with 12%, the least were the 1cl with 6%.

The graph shows that 56.5% of the students are from the College of Maritime Transportation and the remaining 43.5% are from the College of Marine Engineering.

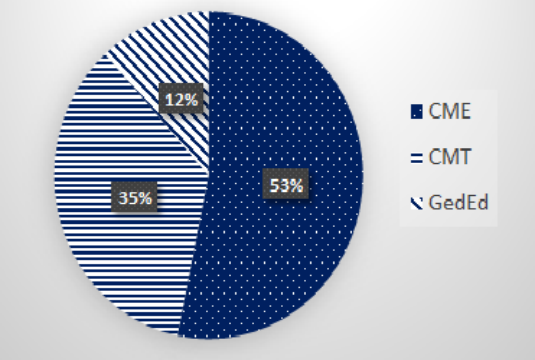


Figure 3. *Faculty Respondents*

Figure 3 shows that the majority of the faculty respondents were from the College of Marine Engineering with 53%, followed by the College of Marine Transportation with 35%, and lastly from faculty members teaching General Education subjects with a 12% distribution.

The data in Figure 4 shows that library email is the most known promotional tool for respondents, accounting for 77%. While lesser than 50% of the respondents are aware of the other promotional tools, such as library bulletin (49%), library websites (43%), and Facebook pages (41%). orientation (29%), audiovisual (TV) (29%), brochures (23%), tarpaulin (23%), messenger (19%), the least known is the Instagram library with only 5%.

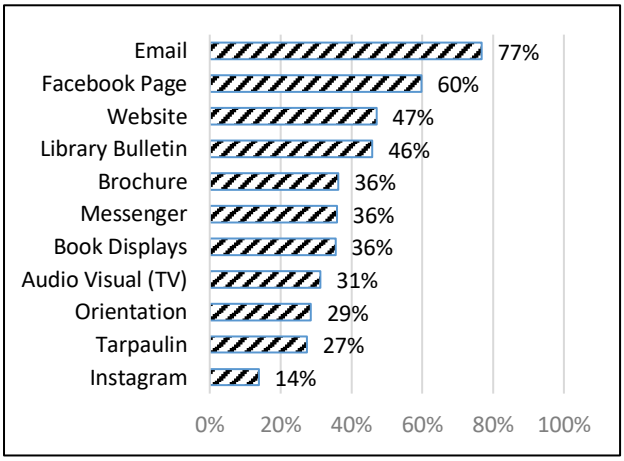


Figure 4. *Awareness of Library Promotional Tools*

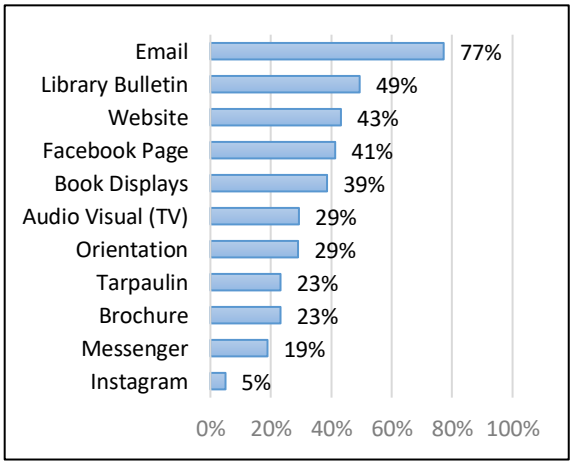


Figure 5. *Preferred Library Promotional Tool*

When it comes to awareness from the respondents, library email has a considerable gap with the percentages from other marketing tools.

As presented in Figure 5, among the promotional tools, 77% of respondents say that email is the most preferred in receiving information, advertisements, and announcements from the library. Facebook follows it with 60%. Other promotional tools got 50% less preference.

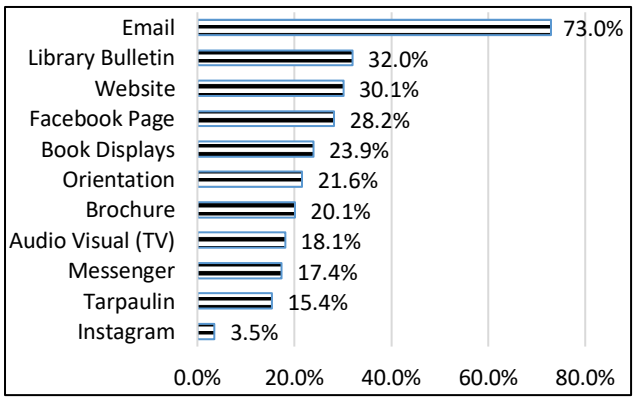


Figure 6. *Library Promotional Tool that Mostly Influenced the Customers to Avail of the Library*

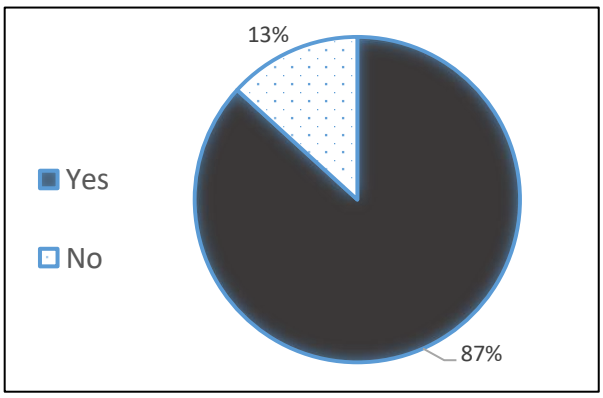


Figure 7. *Number of Users that Agrees that Library Promotional Tools Have Impact on Them*

As shown in Figure 6, 73% of respondents agree that receiving marketing information via email influences library customers more than any other marketing tool.

Figure 7 shows that 87% of the respondents agree that library promotional tools impact them, while 13% claim that it has no impact.

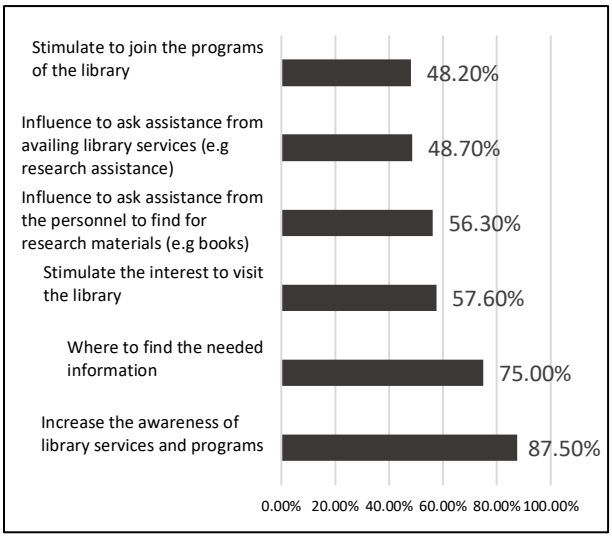


Figure 8. *Impacts of the Promotional Tool on the Customer's Behavior*

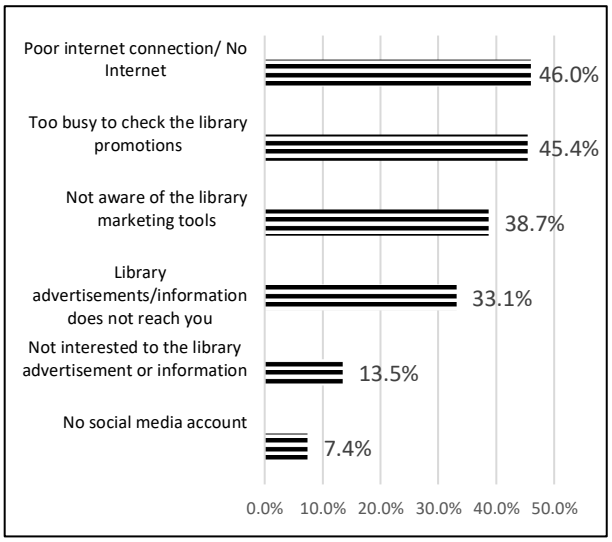


Figure 9. *Reasons Why the Library Promotional Tool Has No Impact*

Figure 8 depicts the impacts of the promotional tool on library customers' behavior. Based on the data gathered, promotional tools have the greatest impact on respondents in increasing their awareness of existing library services, resources, and programs (88%), followed by assisting them in finding the information they require (75%). Furthermore, 58% of respondents think that the promotional tool aroused their interest in visiting the library, and 56% say that they seek assistance from staff in locating research materials. The least impact of the promotional tools to the customers is being able to stimulate them to join the library programs (49%) and ask for assistance in availing library services such as research assistance (48%).

Some library customers finds library promotional tools have no impact to them. Some of the reasons are depicted in Figure 9. Poor internet connection/no internet connection is the top reason accounting to 46%. Too busy to check the library's advertising and, both received 45% of the vote is the top reason. They were followed by 39% of the respondents who agreed that they were unaware of the library's promotional tools. Furthermore, 33% claim that they do not receive library advertisements or information. At the same time, 14% of those data were uninterested in the library's advertising or content and 7% doesn't have social media account.

4. Discussion

Figures 4–6 show that printed promotional tools such as book displays, bulletin boards, tarpaulin, brochures, and library television became less popular during the pandemic since most people turned to online platforms as a source of information. There's also a decrease in the number of people who visit the library. Data shows that most MAAP library customers are aware of library email as a promotional tool for disseminating information. It is also the most preferred medium for library customers to receive updates from the library. They are mostly enticed to check the library

offers through marketing advertisements sent to their email. Fariborzi and Zahedifard (2012) looked at the effectiveness of email marketing and found out that email improves client relationships gain new consumers and advertisers.

On the other hand, the popularity of social networking sites as marketing tools in libraries leads to more studies than other marketing tools like email. Arumugam and Balasubramani (2019) found out in their study that social media such as Facebook is the preferred channel for interacting with the library. Chivandi et al. (2019) said that it has become the new and attractive way to disseminate information in comprehensive coverage and is constantly used in their daily life, the ability to transmit messages outside of the institution (Jones and Harvey, 2019). According to Chan (2010), cited by Alkindi and Al-Suqri (2013), advertising on Facebook pages has a greater impact on users. It became a helpful tool for announcement and library marketing. In addition, Chivandi et al. (2019) added that it is used to express opinions about products and services or get information from other users' comments. Mandrekar and Carvalho e Rodrigues (2020) found out that 100% of the academic libraries agree that they are using social media in promoting the library since it is the easiest and fastest way to reach customers during the lockdown period. WhatsApp (100%) is the most popular among the social networking sites, followed by Facebook (60.5%). Instagram falls one of the lowest levels of promotional tools patronizing by the customers. This result is similar to the findings of this study.

While many literary studies discover the advantages and positive impact of social networking sites such as Facebook as the most popular and preferred marketing tool to the customers, the result of this study turns out to be the opposite. As the majority of library customers stay in-housed in the academy, students are dependent on the internet access protocol of the academy. MAAP library customers, students, and faculty members have corporate email accounts. Since social media accounts are only allowed during weekends for the students, email is often their most used medium of communication. This situation supports the result of this study. It also shows that environmental factors such as internal school policy on internet usage affect access to library promotional tools.

Though email turns out to be the most used and preferred marketing tool of MAAP library customers, it does not necessarily mean that other promotional tools will be set aside by the library. The result only shows the need for more promotion and regular updates of the other promotional tools to be noticed by the library customers to reach a wider demographic.

Mandrekar and Carvalho e Rrodigues (2020) found out that more than 75% of academic libraries use email for promotion. This rate is already considered positive when considering the effective promotional tool for customers.

Steiner (2008), as also cited by Alkindi and Al-Suqri (2013), recommended that libraries consistently update their Facebook pages to attract and engage with customers. Marketing the library using social media allows users to see what the library is doing and how it can work alongside traditional methods rather than replacing them. It makes the library more current and relevant, providing it with a voice that emphasizes the good aspects of its work.

Figure 7 shows that most customers agree that library marketing tools have aided them in increasing their awareness of what the library has to offer and assist them in gathering resources and providing services to support their academic, recreational, and other educational needs. This result shows that the more individuals are aware of the library's existence, the more likely they are to recognize its worth, even in an online situation. It's also an opportunity for librarians to demonstrate that physical space does not limit their ability to assist consumers, even while doing so online.

Mandrekar and Carvalho e Rodrigues (2020) points out that one role of promotion is to raise awareness of the library's services and resources. Figure 8 shows that the library promotional tools' greatest impact on customers is increasing their awareness of the library's resources, services, and programs. It keeps them informed about what the library currently has to offer and how the library is evolving to meet the needs and preferences of its patrons.

As illustrated in Figure 9, 13% agree that library promotional tools have no impact on them. The main explanation is poor internet connection (46%) and lack of time (45.4%) to look for library promotions or a; thus, they are unaware of current library updates. This data has the same result in Mandrekar and Carvalho e Rodrigues (2020). Interrupted Connection got the highest rate as one of the barriers in library promotions.

MAAP students are staying in-house in the academy. They are prohibited from using social media platforms such as Facebook and Instagram during academic days and are allowed during weekends. On the other hand, faculty can access these marketing tools in the comforts of their homes. Email is the commonly used platform for all students and faculties in receiving communications. On the other hand, the library team continuously improves the library website for a centralized link of all the library collections, services, and promotions.

5. Conclusions and Recommendations

1. Most library users are aware of the library email as a promotional tool, and less than 50% are aware of other promotional channels.

2. Email is the most preferred promotional tool of MAAP library customers in receiving information.

3. Marketing information sent via email mostly influenced the MAAP library customers to check out what the library currently offers.

4. Marketing tool aids library customers in becoming more aware of what the library has to offer in the community. This finding highlights the importance of the library as a venue for learning and enjoyment, even online. On the other hand, factors such as a lack of time to check promotional tools and poor internet connectivity cause promotional tools to go unnoticed and have no impact on other library customers.

5. Based on the findings, the library team should continue to use the library email as a marketing tool and regularly update the other marketing tools to attract library customers' attention and provide them with more options for gathering information about the library. Because most people nowadays use internet platforms, the library might take advantage of these marketing opportunities. To keep up with the trend of communication, the library should also look into various online platforms and conduct a series of small group orientation.

6. Overall, the MAAP library promotional tool significantly boosts library customers' awareness of the events, services, and resources that the library provides. It represents the library's role in assisting the community with information and recreational needs. Customers' time and a slow internet connection are uncontrolled factors on the part of the library. Still, there are no reasons for the library to discontinue delivering promotional materials via their marketing tools.

It is recommended that the library team maximize email as a marketing tool to reach out to library patrons in their preferred medium. Other marketing tools, such as printed materials, social media, television, orientation, and the website, should be updated with content and regularly promoted to enhance library customers' knowledge of library promotions and reach a larger demographic of potential customers. Series of small group orientation must be done to have a better discussion with the customers. The library could also explore other online platforms which they think will be more engaging to the target customers.

The researcher suggests conducting a comparative study on the improvement of the promotional tools of the library and its impact on the library customers for the next academic year. Also, to conduct an independent study focusing on individual promotional tools for a deeper understanding of the promotional tools and strategies of the library.

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Stress Level of the Maritime Academy and the Pacific Faculty and their Teaching Performance

Research Priority Area: **Science and Technology, Culture and Maritime Environmental Studies - Healthy Communities**

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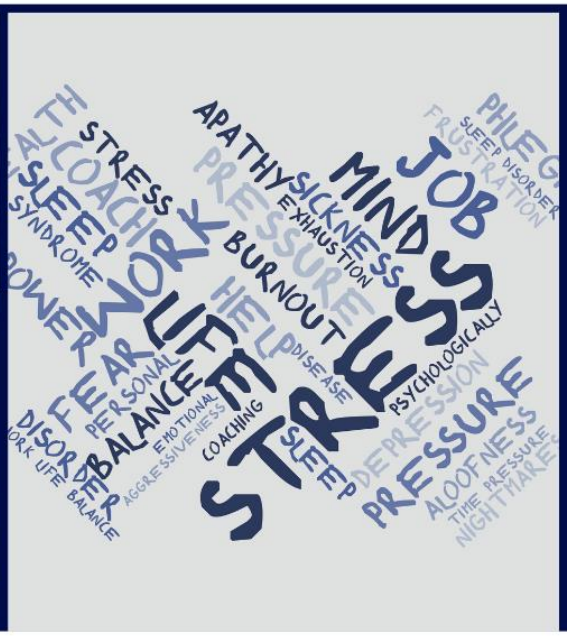

ABSTRACT

Stress is an inevitable part of teaching. If dealt with constructively, it can make a teacher more productive and effective. If it goes beyond the threshold of the teacher, however, it may have negative effects, not only to the teacher as a person but also to the practice of his or her profession. In general, this research focused on describing the stress level of the faculty members of the Maritime Academy of Asia and the Pacific (MAAP), their most and least stressors, and their teaching performance as indicated by their evaluations. Data on stress level was obtained using the Perceived Stress Scale, while the data on the most and least causes of stress was gathered using a survey. The teaching performance of MAAP faculty was measured using the MAAP faculty evaluation forms. Supervisors and fulltime instructors were also interviewed to substantiate the numerical data. Data showed that MAAP faculty had low to moderate level of stress. Technological concerns and human relations, compounded by the implemented protocols came out to be the most causes of stress, while the actual teaching and the colleagues in the Department of Academics were the least causes of stress to MAAP faculty. As for teaching, MAAP faculty recorded a very satisfactory to outstanding performance. With these findings, the management may consider facilitating appreciation activities to boost and/or maintain the morale of the instructors.

KEYWORDS: ***Teacher stress, Stressors***

1. Introduction

The unprecedented spread of the Covid-19 virus in 2020 has affected the world extensively, forcing the different sectors to change or adjust their operations. Economy, tourism, transportation, and other essential areas like the education sector had to devise ways to continue operating and functioning effectively and safely. To curb the spread of the virus and protect the health of the people, the world's governments implemented community quarantines at different levels. Safety guidelines were formulated to be followed so that the spread of the virus may be stopped or avoided. In the Philippines, the Inter-Agency Task Force (IATF) is the government agency responsible for formulating safety protocols, monitoring their implementation, and coordinating with other concerned agencies to ensure the safety of the Filipinos. Following the IATF guidelines, different schools terminated face-to-face classes and shifted to flexible learning.

Flexible learning enables students and teachers to continue the teaching-learning process without having to meet face-to-face in the classroom or school. Flexible learning can be done online or distance with the students being self-directed (Tucker & Morris, 2012) and actively engaged and responsible (Chen, 2003). With this new and/or additional set-up, adjustments can be done in terms of the “time, place, pace, learning, style, content, assessment or pathways” (Chen, 2003). The quoted terms are supported by the flexible learning setup for adult education as described by Vallance (2007) and the experience of Thomas (2012).

The Commission on Higher Education [CHED] (2020) captures the definition and application of flexible learning considering time, place, and persons engaged in the process. While it entails the use of technology, this may vary depending on the availability of technological devices, connectivity, the knowledge on the use of technology of those involved, and the approaches employed by both the teachers and the learners.

The Maritime Academy of Asia and the Pacific (MAAP) responded productively and shifted to online learning, albeit teachers rushed to transition from their face-to-face classes to google classrooms. Crash trainings and/or orientations were done so that everybody could cope and be able to finish the second semester. This shift in the delivery of lessons could have caused additional stress to the faculty who were already busy preparing their lessons, developing modules and workbooks, and other teaching tasks. Teaching is a very stressful job (McCarthy, 2019; Sokal et al., 2020b; Stone, 2021;) despite its rewards (Sokal et al., 2020a). It is within this premise that this research was conducted: to check the perceived level of stress of MAAP faculty and relate this to their teaching performance during the last three semesters covering the first major wave and one-year effect of the pandemic brought about by Covid-19.

Conceptual Framework. According to Cox et al. (2000), stress is a negative mental and emotional condition that affects the health of the individual experiencing it and his or her organization. This definition is based on the psychological approach to stress which views stress as the "…dynamic interaction between the person and their work environment (p. 11).”

The illustration below captures the interplay of the variables covered by the study. The identified level of stress of the MAAP faculty, including the most and least stressors, is correlated with their teaching performance for three semesters.

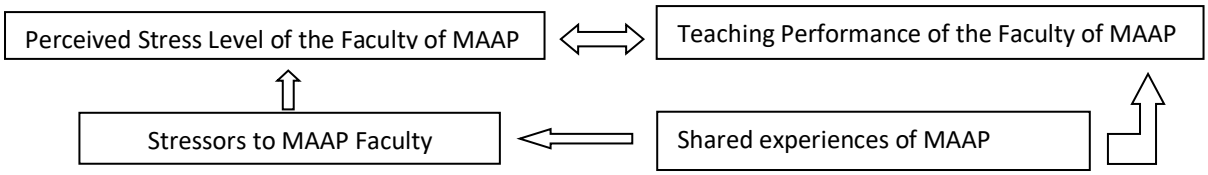

Figure 1. *Research Paradigm*

The researchers also included the data on the informal interview to enrich the analysis of the objective data on the level of stress and the teaching performance of the participants.

Statement of the Problem. With the sudden shift to online learning and the preparations that had to be done swiftly by the faculty members, this paper aimed to describe the perceived level of stress of the teachers of the Maritime Academy of Asia and the Pacific and relate this to their performance.

Specifically, it sought to answer the following:

1. How may the perceived stress level of the faculty members of MAAP be described?
2. Are there significant differences in the perceived levels of stress of MAAP faculty?
3. What were the most common stressors to the faculty members of MAAP?
4. What were the least stressors to the faculty members of MAAP?
5. How may the teaching performance of the faculty members of MAAP be described?
6. Is there a correlation between the perceived stress level of the faculty members of MAAP and their teaching performance?

Review of Related Literature. Teacher stress is the imbalance between the demands of teaching and the resources to meet these demands (Kyriacou, 2001 as cited by McCarthy, 2019). It may also be defined as the negative responses, psychological and physical, to the tasks or events that are related to teaching (Stone, 2021).

Using the term occupational stress, Kaur (2017) describes the concept as a negative result of the teachers' interaction with the different areas of their profession, which cause negative reactions such as frustrations, anxiety, conflict, and the like. In context, teacher stress is caused by undesirable factors within or outside the school organization, where teachers are exposed and are negatively affected as far as their effective practice is concerned.

The pandemic increased the difficulties of the teachers and negatively affected their well-being (Alves et al., 2020). In MAAP, the teachers had to ensure the continuity of learning of the students, so they had to suddenly adapt and shift to online learning. As Presley (2021) revealed, teachers faced new requirements for institutions, job expectations, and classroom environments. With these past findings, the present study explored the stress level of MAAP faculty and the supervisors during the first years of the pandemic and checked if this stress level was related to their teaching performance.

A large number of teachers have suffered from depression, stress, and emotional exhaustion, which overlap with the established symptoms of burnout (Seth, 2016). All these have an impact on the effectiveness of teachers. Relatedly, some of the predictors of burnout are the Covid anxiety scale, current teaching anxiety, anxiety communicating with parents, and administrative support (Presley, 2021). In another study, Slovenian educators revealed that the use of ICT in online education, attitude toward online education, and online support predicted their stress (Košir et al., 2020).

During the pandemic, head teachers and private school teachers indicated an increased level of work-related anxiety, with head teachers expressing a higher level of anxiety than private school

teachers. Meanwhile, state school classroom teachers claimed that the lockdown did not really affect their level of work-related anxiety. Notably, the level of work-related anxiety was higher in females than males. Respondents were more inclined to agree that the pandemic negatively affected their mental health (Allen et al., 2020).

In another study, Chitra (2020) claimed that online classes may make the teachers feel isolated but more loaded so this indirectly makes them stressed. She further cited the American Psychological Association (2007), explaining that occupational stress may lead to promotion refusal or quitting from the job; hence lower employee commitment. As a result, an increase in occupational stress reduced job satisfaction. In addition, Sokal et al. (2020a) reported three findings: teachers during the pandemic had more negative feelings about the demands of the job but were ably answering the demands of the times; some teachers were bitter toward those who were resilient; and the role of school leaders was important during the pandemic.

In another country, Abilleira et al. (2021) worked on measuring the technostress (a negative impact of using information and communications technology on the psychophysiological aspect of a person) of university teachers in Spain during the pandemic. The researchers found that those who had face-to-face classes had higher technostress than those already exposed to online teaching. Also, the same researchers found that female and older teachers who held high positions had a higher level of stress. In addition, both groups were reported to have had a decline in their work performance during the pandemic but for different reasons.

With the participating teachers in the United States, Stone (2021) reported a much higher level of stress during the pandemic due to Covid-19- related factors, including its effect on teaching, that is, online learning. Administrative support was also identified as a key player in increasing the morale of teachers at this time. The study used the same tool used by the present researchers as part of their survey. Likewise, interviews were conducted so they could validate their numerical data.

2. Methods

To answer the questions on the perceived stress of the faculty members of MAAP, a survey was conducted on 65 instructors of the Department of Academics. The number represents 85.5 percent of the total population of instructors in the Department. Part-time instructors who belong to other offices like the MAAP Simulator Center (MSC) or the Center for Competency Assessment (CCA) were not included in the survey. Of the 65 respondents, nine (9) were supervisors, 20 were Marine Transportation instructors, 12 were Marine Engineering instructors, and 24 were General Education instructors.

The survey tool used was the Perceived Stress Scale developed by Cohen in 1994. The scale consists of 10 general questions that asked the respondents about the degree to which they perceived their experiences as stressful during the previous month. The data collection was done in July 2021, so the respondents referred to the month of June. During this time, the faculty members were more or less doing their routine tasks- delivering online instructions, checking papers, submitting progress reports and attending to their other instructional or administrative duties. The responses were scaled from 0 (never) to 4 (very often), with the scores interpreted as follows:

0-13	low perceived stress
14-26	moderate perceived stress
27-40	high perceived stress

When the answers of the participants were scored, the corresponding scores for items 4, 5, 7, and 8 were reversed so that an answer of 0 was equal to 4 and vice versa.

The data on the faculty evaluation was requested from the Office of the Dean. The data included the evaluation of the faculty members for the second semester of the academic year 2019-2020 and the two semesters of the academic year 2020-2021. The researchers used and recorded three (3) evaluation results.

To understand the data further, the researchers conducted informal interviews with some of the participants of the survey. In an attempt to represent the different groups, at least three interviewees were asked questions regarding their teaching and supervising experiences during the onset of the pandemic and the succeeding two semesters.

The researchers used codes for the names in the final data processing to ensure confidentiality of the information and protect the identity of the participants. Further, the researchers indicated in the tool that any information shared by the respondents would be treated with the strictest confidentiality and would be used solely for the research conducted.

For the statistical analysis of data, the researchers used the frequency count and mean to answer questions 1, 3, 4, and 5. Question number 2 was answered using ANOVA and LSD test. As to the last question, Spearman Rank Correlation was used to determine whether there was a relationship between the perceived stress level of MAAP faculty and their teaching performance.

3. Results

This paper primarily aims to describe the perceived level of stress of the faculty members of MAAP and their teaching performance. It also identifies the most and the least stressors to faculty members. Finally, this paper shows whether the perceived stress level of MAAP faculty is related to their teaching performance.

The perceived stress level of the faculty members of MAAP. Table 1 shows the level of perceived stress of MAAP faculty during the previous month, which is the month of June. Data show that more than half of the faculty members, 40 out of 62 or 65%, have a low level of perceived stress. Among the four groups, the group of General Education instructors had the lowest level of perceived stress while the Marine Engineering instructors recorded the highest level. Individually, supervisors, together with the deck instructors, were low to moderately stressed. Engine instructors perceived themselves to be low to highly stressed, while all the general education instructors indicated a low level of perceived stress.

Table 1. *Crosstabulation of Type of Respondent and Perceived Level of Stress of MAAP Faculty*

Type of Respondent	Stress Level			Total
	Low (0-13)	Moderate (14-26)	High (27-40)	
Supervisor	5 (8.1%)	4 (6.5%)	-	9 (14.5%)
Deck	8 (12.9%	12 (19.4%)	-	20 (32.3%)
Engine	6 (9.7%)	4 (6.5%)	2 (3.2%)	12 (19.4%)
Gen Ed	21 (33.9%)	-	-	21 (33.9%)
Total	40 (64.5%)	20 32.3%)	2 3.2%)	62 (100.0%)

Note: % is with respect to Total

Comparison of the perceived stress level of MAAP faculty. As seen in Table 2, the engine faculty members, followed by the deck instructors, were the most stressed, having average respective stress

scores of 16.08 and 14.75, which are considered moderate. The general education instructors, with an average of 4.24 stress score, were the least stressed among the groups.

Table 2. *Comparison of the Perceived Stress Level of MAAP Faculty*

Area	N	Mean[1]	Stress Level	SD	$F_{(0.05)}$	LSD[2]
Engine	12	16.08	Moderate	6.73	21.02	A
Deck	20	14.75	Moderate	6.27	*(p<0.01)*	Ab
Supervisor	9	13.11	Low	4.20		B
Gen Ed	21	4.24	Low	1.92		C
Total	62	11.21		7.07		

Note (1) Mean score according to group; (2) Means of similar letters are not significantly different.

The F-value of 21.02 ($p<0.01$) suggests significant differences in the mean stress levels of the faculty members when grouped according to area.

LSD test indicates that the level of stress of engine and deck maritime instructors were not significantly different; however, their level of stress was significantly higher compared to that of the general education instructors. Engine instructors had a significantly higher stress level compared to the supervisors, but the deck group did not differ significantly from that of the supervisors. The supervisors had a significantly higher stress level compared to the general education instructors.

Most common stressors to the faculty members of MAAP. Table 3 presents the things or factors that stressed the MAAP faculty the most and the number of respondents that mentioned them. Based on the table, faculty members were stressed the most because of poor internet connection as indicated by the 16 frequencies of mention in the survey. The poor internet connection was followed by co-workers (7), cadets (6), restrictions (6), expected output within a limited time (4), superiors (4), and checking of papers (4).

Table 3*. Main Stressors to MAAP Faculty*

Cause of Stress	Freq.	Cause of Stress	Freq.
Poor internet connection	16	Virus	3
People/co-workers	7	Facing my laptop all day	3
Cadets	6	Lack of materials and equipment	2
Restrictions/health protocols	6	Unscheduled meetings	2
Expected output within a limited time	4	Uncontrollable things	2
Superiors	4	Tasks other than teaching	2
Checking of papers	4	Doing/submission of final grades	2
		Schedule	2

Least stressors to the faculty members of MAAP. As seen in Table 4, the faculty members of MAAP had the least stress on their actual job, which is teaching. Their co-teachers, their salary, their work from home status, and their work schedule were also among those factors that caused them the least to minimum stress.

Table 4*. Least Stressors to MAAP Faculty*

Cause of Stress	Freq.	Cause of Stress	Freq.
Actual teaching	10	Students	3
Colleagues	7	Work area	3
Salary	5	Vacant hour	3
Working from home	4	Management	2
Work schedule	4	Tasks	2

Teaching performance of the faculty members of MAAP. As reflected in Table 5, MAAP faculty's teaching performance as perceived by their students and supervisors ranged from very satisfactory to outstanding, with the highest average mean recorded during the second semester of academic year 2020-2021. During the same period, the deck group recorded the highest performance rating of 4.61 with a descriptive equivalence of outstanding. While lacking data for the second semester of the academic year 2020-2021, the general education group recorded the lowest evaluation rating for two consecutive semesters.

Table 5.1. *Teaching Performance of MAAP Faculty*

AY, Semester	Descriptives	Group				
		Supervisor	Deck	Engine	Gen Ed	Total
2019-2020- Sem2	Mean (SD)	4.41 (.29)	4.61 (.27)	4.47	4.32 (.88)	4.44 (.64)
	N	4	10	1	14	29
2020-2021-Sem1	Mean(SD)	4.62(.34)	4.66(.21)	4.73(.26)	4.38(.36)	4.55(.31)
	N	5	16	2	14	37
2020-2021-Sem2	Mean (SD)	4.64 (.31)	4.71 (.18)	-	-	4.68 (.23)
	N	7	13			20

Evaluation of the teaching performance of instructors is important in addressing teaching and learning effectiveness and raising the quality standards of education (Bichi, 2017) or education systems (Almeida, 2017). In MAAP, teacher evaluation comes from three sources: classroom observation forms (announced and unannounced) from the supervisors, teaching evaluation form from the students, and performance evaluation on co-curricular/administrative work performance form from the supervisors. This evaluation is conducted and administered every semester.

Table 5.2. *Evaluation of MAAP Faculty Before and During the Pandemic*

Evaluation	N	Mean	SD	Paired difference	$t_{(0.05)}$	Cohen's d
Pre-pandemic (AY2019-2020)	27	4.75	.21	M = .27	2.33	0.44
Pandemic (AY2019-2020, sem2–AY2020-2021, sem2)	27	4.48	.69	*SD = .61*	*p=0.03*	(small)

Paired correlation = 0.51, p = 0.007

Faculty evaluation before and during pandemic is statistically different (t(26) = 2.33, p = 0.03). However, the Cohen's d effect size of 0.44 indicates that the difference is practically small. Using Cohen's d explanation as cited by McLeod (2019), it may be inferred that the pandemic affected the performance of MAAP faculty but this effect is small.

Correlation between the perceived stress level of the faculty members of MAAP and their teaching performance. As presented in Table 6, there was no significant relationship between the stress scores and the faculty performance ratings during the three (3) semesters considered in the study. This result was validated by the no significant relationship manifested by the chi- square analysis.

Table 6. *Correlation between Perceived Stress Level and Teaching Performance of MAAP Faculty*

Semester	R	Sig.	Remarks	X^2	Sig.
AY2019-2020, Sem2	0.05^{ns}	0.79	Very low correlation	$.617^{ns}$	.74
AY2020-2021, Sem1	0.28^{ns}	0.10	Low correlation	3.68^{ns}	.16
AY2020-2021, Sem2	0.16^{ns}	0.51	Very low correlation	1.05^{ns}	.15

Notes: 1. ns – not significant at 0.05 level

2. ±0.90 – ±1.00 - Very high correlation; Very Significant relationship; ±0.70 – ±0.89-High correlation; Significant relationship; ±0.40 – ±0.69 - Moderate correlation; Average relationship; ±0.20 – ±0.39-Low correlation; Small relationship; 0 – ±0.19 - Very Low correlation; Almost no relationship

4. Discussion

The results show that MAAP faculty members were stressed, but only two respondents from one group (Engine) indicated a high level of stress. This may mean that they were able to answer the teaching work demands of the pandemic and performed their jobs well. As Panigrahi (2016) said, "Stress within a specific limit helps to achieve necessary objectives" (p. 160). This result shows that despite the changes brought about by the pandemic, faculty members were able to adapt well and still function as expected, without being too stressed. In one of the interviews conducted with one faculty member, she shared that the pandemic did not cause her more stress. On the contrary, she became more focused and exerted less physical effort. One supervisor also said that the pandemic was actually to her advantage. Though there was more workload, she was also able to spend more time with her family. This was supported by one faculty who said, "*Siguro kaya hindi stressful kasi kasama mo family mo, nasa comfort zone ka* [I think the reason why it was not stressful is that you are with your family, your comfort zone]."

In addition, the results of the present study are in contrast with the findings of Allen et al. (2020) and Abilleira et al. (2021) who reported that those who held positions expressed higher levels of stress than the other teacher-participants. Also, the same findings of the present study do not match the findings of Klapproth et al. (2020) on the stress level (moderate to high) of secondary school teachers in Germany.

The significant differences in the level of stress of the respondents may be attributed to the nature of the programs offered by the Academy. For one, the major courses had to go through more changes or adaptations when compared with the general education courses, and the expectations of the maritime officers- instructors to deliver the courses within the scheduled time could have increased their level of stress. As mentioned by one interviewee, "*Maraming kinakaing oras ung laboratory assessments tapos kailangan pa naming maghabol* [Laboratory assessments take a lot of time, and we need to catch-up]." This concern about the conduct of laboratory classes and assessments was supported by two more interviewees. One added, "*May restrictions kasi, unlike nung dati* [There were restrictions, unlike during the normal days]."

The monitoring demands from the supervisors may explain their higher level of stress compared with the general education instructors. During the pandemic when the instructors taught online while at home or in quarantine for a total of almost two months, the supervisors could only communicate with them using their phones or Facebook messenger. They could not go directly to them in person and discuss matters with them, so this may have added more burden to them. One supervisor compared her work with that of the instructor. She said, "*Lahat iniintindi mo, unlike sa instructor na teaching lang ang iniisip. Ung isang teacher, tatawag dahil may concern so haharapin mo un, kasama ung ibang trabaho mo as supervisor* [You attend to everything, unlike the instructor whose focus is the delivery of instruction only. One teacher calls and you need to address his/her concern, together with your other tasks as supervisor]." An engine group supervisor specified the audits and the faculty loading assignment, with other supervisors working from home, as reasons for their added stress. This higher level of stress on the supervisors may be likened to the finding of Allen et al. (2020), that head teachers expressed a higher level of anxiety compared to those who were not in position.

MAAP, like all other institutions in the country, was not internet-ready during the onset of the pandemic. While the Academy had an initial strong internet connection, it could not serve all the users when the Academy shifted to full online learning where the students had to use their individual or group gadgets. During this time, the faculty members and the students had to reconnect many times

to continue their online discussion. To quote one interviewee, "*Internet connection can always fail us, anytime, anywhere.*"

The stress caused by dealing with co-workers may be attributed to the fact that the faculty members could not see each other and did not have a chance to use nonverbal communicative cues and behaviors like gestures, facial expressions, and varying tones of voice in sending their messages across. One supervisor described his experience saying, "*Mahirap kausap kapag hindi kaharap. Nakaka-stress ung paulit-ulit tapos mami-misinterpret ka pa* [It's difficult to communicate if you're not face-to-face. It is stressful when you have to repeat yourself many times only to get misinterpreted.]" Relatedly, one respondent specified that he was not stressed because of his co-workers in the Department. He was stressed because of the people from other departments who were difficult to deal with and who wanted to control and order people around.

The same is true for the stress caused by the students. There were times that the students were late or got disconnected and took time to connect again, and this took a toll on the teachers. Also, the submission of requirements and monitoring the accomplishments of tasks were difficult on the part of the teachers because they could not immediately address the concerns of the students, and the latter were not cooperative all the time.

In a related study of Klapproth et al. (2020), they revealed that excessive workload of students and their low motivation were the main barriers to their effective teaching, together with internet connectivity. As mentioned above, since the faculty members could not immediately address the concerns of students, their tasks could pile up especially since they did not meet synchronously for the whole duration of their time.

5. Conclusions and Recommendations

The faculty members of the Maritime Academy of Asia and the Pacific have been performing well during the pandemic. They have exhibited a low to moderate level of stress. In fact, their teaching performance remained to be beyond average, further confirming that they were able to stay on top of the circumstances resulting from the pandemic. It should be noted, however, that the data gathering for this study was done more than a year after the initial worldwide impact of COVID-19. It may be assumed that MAAP faculty have adjusted already and have adapted well to the changes brought about by the pandemic, so they responded positively to the stress survey.

This study has contributed to the aim of the Department of Academics to look into the welfare of its faculty during the pandemic. It has also contributed information on what stresses the faculty members the most so it can provide remedies. On the other hand, the gathering of data was done during the time when the teachers have more or less adjusted to the situation, so the data does not include information on the stress and struggles with it, if there were, of instructors during the first few months after the declaration of the pandemic. Narrative research could be done to look at the transition of faculty from face-to-face to online teaching. Moreover, the students and the support offices to the academic operations could also be rich sources of data, so a research focused on them could also be conducted. Specifically, the two programs, BSMarE and BSMT could be separated to compare or differentiate their responses and/or struggles.

The coping strategies employed by MAAP faculty were not included in this study. It is also a good area of research so that if published, other instructors who have different coping strategies may also be informed of other possible and effective means of addressing stress.

Finally, instructors identified teaching itself as their least cause of stress. This finding indicated their love for their work despite its challenges. To maintain the passion of the MAAP faculty, the administration or the academic leadership may facilitate an appreciation activity once in a while to make the teachers feel that they are valued and recognized for their efforts. This kind of activity may boost their morale and may encourage them to work harder with more commitment.

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