ASSESSING STUDENTS' RESEARCH EXPERIENCE AT THE UNIVERSITY OF PERPETUAL HELP SYSTEM LAGUNA COLLEGE OF MARITIME EDUCATION

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Abstract

This paper investigated the research experience of third year maritime students who were completing their academic requirements for B.S. Maritime Engineering (BSMarE) and B.S. Marine Transport (BSMT) at the University of Perpetual Help System Laguna (UPHSL) College of Maritime Education (CME) by employing a descriptive research design. A survey for third year students was conducted during second semester of the Academic Year (AY) 2017-2018, which was a semester after the completion of their research course. The research aimed to gauge the students' research experience and their satisfaction with it. Specifically, it determined their satisfaction with their research experience along thesis adviser's quality of supervision (QS), skill development (SD), intellectual climate (IC), support infrastructure (SI) and thesis defense process (TD). Results showed that respondents are satisfied with QS, SD, IC, SI and TD during their CME research course. SI received the lowest score during the survey. Results also showed that there is no significant difference in the respondents' satisfaction with their research experience when grouped according to their degree program implying that research experiences provided by the college are perceived to be satisfying by the student researchers. Recommendations to improve students' research experience as well as areas of further research were also presented.

Keywords: research experience, undergraduate research, maritime education, quality of supervision, skill development, intellectual climate, support infrastructure, thesis defense process

Introduction

There is a substantial and growing collection of literature indicating the impact of research involvement by college students. Studies highlight research benefits, including increased critical thinking, refined communication skills, clearer organizational skills, healthy sense of self-efficacy and competence, and collaborative learning (Hunter, et al., 2006; Lopatto, 2006). Many college educators have realized the potential for authentic undergraduate research to be a high-impact educational experience for achieving academic excellence (Lopatto, 2010). Positive outcomes have been demonstrated by students who participate in course-based undergraduate research experiences and those by students in independent research experiences,

such as   heightened self-confidence (Bascom-Slack et al. 2012), enhanced conceptual understanding (Rhode Ward et al. 2014), and improved science process skills (Kloser et al. 2013). Similar previous study by Lopatto (2006) observed that student-researchers accumulate skills in personal development, including an increase in self-confidence, a sense of accomplishment and independence of work and thought.

Research indicates that the intent of research-based pedagogy was to situate learners to learn from teachers of research courses that stimulate learning through discovery rather than by the traditional transmission of knowledge (Abrams et al., 2009). Similarly, Falconer and Holcomb (2008) find that research as an educational experience proves to be a potent learning method and augments traditional classroom learning. Kuh (2003) agrees to this view, noting that learners immersed in their learning through research are found to have richer educational experiences. Lopatto (2010) concludes that the majority of research experiences enhances intellectual competencies such as communication, inquiry and analysis, and collaborative working. Additionally, learners who are more involved in educational activities and processes through research develop a sense of ownership of the learning process, which in turn realigns the learning responsibility from instructor to student in the learning situation. (Alderton & Manzi, 2017).

A number of studies (Bandura, et al., 2000; Seymour, et al., 2004) show the benefits of undergraduate research, including refined critical thinking, better communication skills, clearer organizational skills, self-efficacy and competence, and collaborative learning. These skills required to perform research are important management competency in a global knowledge economy (Davis, et al., 2006). They are relevant in sustaining life-long learning and professional development (Waite & Davis 2006). Specifically, a well-meaning research experience for students should develop the skills needed, and be centered on an experience that enables students to learn how to undertake a research project. (Riesel, et al., 2015).

Lopatto (2003) highlights the development of relationship between the learners and their thesis adviser as well as the relationships among research group members during the research process. A similar study by Abrams et al., (2010) indicates that the benefit of undergraduate research experiences includes a more meaningful relationship between learners and research advisers. Such relationship often present learners with professional and personal connections that prove to be critical in subsequent undertakings (Collins, 2006). Furthermore, Falconer and Holcomb (2008) insist that social and communication skills can be enhanced by college research activity, with students indicating that making friends and networking with other learners are valuable aspects of the research process. Lei and Chuang (2009) believe that skills enhanced in the research process are essential in any career choice and these include self-confidence, teamwork, leadership, time-management, and social skills.

Embarking on a research project can be a challenging undertaking, yet several undergraduate students stressed the pride they experienced during the project. (Abrams, et al., 2009). A major issue is the tension between research time and study time during the research project (Lopatto, 2010). Another major challenge cited by student-respondents involves around the observations that thesis advisers mostly lacked the time to interact with the students (Garwe, 2015) due to the workload of the advisers and the students as well as the resulting scheduling conflicts. Ocbian & Gamba (2015) enumerate heavy teaching loads, lack of motivation and commitment, and financial constraints as factors hindering graduate students' research. Lastly, a

research environment that is supportive to learners is important in transitioning to becoming a producer of research knowledge (Lovitts, 2001, 2008).

This study is relevant and timely to the review of research processes at the University of Perpetual Help System Laguna (UPHSL) College of Maritime Education (CME) in Biñan, Laguna, Philippines as results will allow the college to identify key areas that impact research output. The study may be used to determine the quality of undergraduate programs, faculty productivity and institutional resources in terms of research mentoring. The information from the study will assist school administrators, educational managers, faculty members and maritime students to improve the conditions that contribute to student engagement and to the over-all quality of research experience.

For this purpose, the study assessed the satisfaction with the undergraduate research experience among third year UPHSL CME students in terms of the thesis adviser's quality of supervision (QS), skill development (SD) and intellectual climate (IC) as well as the support infrastructure (SI) and thesis defense process (TD). Likewise, the researchers also solicited inputs from students on how to improve their research experience.

The researchers found the following knowledge gaps: there are scant studies conducted regarding the research experience of maritime students globally and in the Philippines and there are no studies conducted involving variables used in the study.

This study determined satisfaction with research experience among third year students at UPHSL CME. Specifically, it focused on the following sub-topics: the respondents' profile in terms of degree program and the respondents' satisfaction with their research experience in terms of Quality of Supervision by Thesis Adviser (QS), Skill Development (SD), Intellectual Climate (IC), Support Infrastructure (SI) and Thesis Defense Process (TD) as well as determining if there a significant difference in the respondents' satisfaction with their research experience at UPHSL CME when grouped according to their degree program and how the UPHSL CME research experience can be improved.

The paper's theoretical underpinning was based on the learning theory of American psychologist Edward Lee Thorndike (1914, 1999). In proposing this theory, Thorndike proposed three (3) laws: the law of exercise, the law of readiness, and the law of effect. The learning theory of Thorndike represents the original S-R framework of behavioral psychology wherein learning is the result of associations forming between stimuli and responses. (Thorndike, 1914, 1999). In this research, the academic requirement of completing the research course is the stimulus while the research outputs and the research experience of the students are the responses.

Summing up, undergraduate research is positively correlated with academic success, retention and persistence. (O'Donnel, et al., 2013).

Methods

This study utilized the descriptive method of research that describes the nature of the situation as it exists at the time of study, in this case, the relevant issues that surround the satisfaction on the undergraduate research experience among third year maritime students at UPHSL CME.

A survey was conducted to third year maritime students during the second semester for the Academic Year (AY) 2017-2018, which was a semester after the completion of their research project. The questionnaire was anchored on The 1999 Post Graduate Research Experience Questionnaire (PREQ) developed by John Ainley (2001) in determining postgraduate research experiences. The PREQ instrument was adopted for Philippine setting, using Filipino education terminologies, and resulting in 23 indicators for the satisfaction on the research experience.

The researchers used non-standardized questionnaire consisting of three parts. The first part covered the respondent profile, i.e. their degree program (BSMarE or BSMT). The second part pertained to the respondent's satisfaction of their research experience at UPHSL CME. The questionnaire was based on a 4-point Likert Scale as shown below to determine their agreement on the indicators. At the last part of the survey, respondents were also asked to validate student recommendations on how UPHSL CME could improve students' research experience.

The face and content validity of the questionnaire were reviewed by a panel of experts comprised of an expert in research, an expert in statistics and an expert in academic management. Their feedback were incorporated in the final draft of the questionnaire. To determine the respondents' satisfaction with their research experience as well as their agreement with the recommendations to improve research experience, the following measures were used:

Assigned Points	Numerical Ranges	Categorical Responses	Verbal Interpretation
4	3.50-4.00	Strongly Agree (SA)	Very Satisfied
3	2.50-3.49	Agree (A)	Satisfied
2	1.50-2.49	Disagree (DA)	Dissatisfied
1	1.00-1.49	Strongly Disagree (DA)	Very Dissatisfied

The following statistical tools were used in this study: descriptive statistics were used to determine the respondents' profile and the items in the profile were interpreted through the use of percentage distribution; weighted mean was used to determine respondents' satisfaction with their research experience at UPHSL CME, which has twenty four (24) indicators. Mann-Whitney U was used to determine if there is significant difference in the respondents' satisfaction with their research experience when they are grouped according to their degree program (BSMarE and BSMT). A significant value of 0.05 was used to determine statistical difference of the variable measured.

Results and Discussion

All third year maritime students from five class sections (2 sections from BSMarE and 3 sections from BSMT) were asked to participate in the survey. A 62.69% response rate was achieved for this survey. Sixty five (65) of the 87 BSMarE students responded (74.71% response rate) while of the 181 enrolled with BSMT, 103 responded (56.91% response rate). As shown in Table 1, more than 60 percent of the respondents were pursuing Bachelor of Science in Marine Transportation (BSMT) and almost 40 percent were taking up Bachelor of Science in Marine Engineering (BSMarE).

Table 1. Respondents' Profile in terms of Degree Program

Degree Program	Frequency	Percentage
BSMarE	65	38.69
BSMT	103	61.31
Total	168	100.00

Overall, respondents were satisfied with all five (5) predictors of the research experience, namely, Quality of Supervision of Thesis Adviser (QS), Skill Development (SD), Intellectual Climate (IC), Support Infrastructure (SI), and Thesis Defense Process (TD), as shown in Table 2.

Table 2. Overall Mean of Predictors

Predictors	Mean	Interpretation
Quality of Supervision by Thesis Adviser (QS)	3.40	Satisfied
Skill Development (SD)	3.39	Satisfied
Intellectual Climate (IC)	3.35	Satisfied
Support Infrastructure (SI)	3.29	Satisfied
Thesis Defense Process (TD)	3.38	Satisfied

Specifically, respondents agree with the Quality of Supervision by Thesis Adviser (QS). The respondents are satisfied that their advisers provided a much needed feedback on their research progress and a good guidance in their literature review and in topic refinement. They also rated their advisers high in providing additional information related to their research topic and in showing empathy to understand the challenges they are facing as well as in providing supervision when the respondents needed it. This is similar to the findings of Armstrong & Shanker (2006) who found that "*the majority of supervisors adopted the role of resource person, directing students to references and contacts, discussing ideas and work undertaken*" as well as by Jaarsma, et. al (2009) who argued that "*supervision is key to the quality of undergraduate research internships.*"

For Skill Development (SD), respondents agree that the research experience sharpened their analytical skills, further developed their problem-solving skills and enabled them to learn to develop their ideas. They also agree that doing research enhanced their ability to pace their work

load and made them feel self-confident about facing unfamiliar problems and situations. These skills are similar to the findings of Osborn & Karukstis (2009) who detailed improvements in intellectual and practical skills of undergraduate students undertaking research projects, including the "*greater gains in mastering both content and contextual knowledge, enhanced ability to put classroom knowledge into practice, increased creativity and critical thinking, enhanced problem-solving skill, enhanced communication skills, and enhanced technical skills.*"

In terms of Intellectual Climate (IC), the respondents agree that UPHSL College of Maritime Education (CME) provided opportunities for social and intellectual contacts with other learners and opportunities for researchers to participate in the larger research culture. They also agree that CME provided adequate research course and seminar and that the research ambience in the college stimulated their work. Furthermore, the respondents agree that they were integrated into CME's community. Osborn & Karukstis (2009) have a similar observation that "*a culture of undergraduate research . . . brings intellectual vibrancy to the campus and fosters an engaged community of scholars.*"

In terms of Support Infrastructure (SI), the respondents agree that they had access to a suitable working space in the UPHSL library and to computing facilities and services. They also agree that they had access to needed equipment and to technical support when needed. The importance of Support Infrastructure (SI) was highlighted by Blockus (2016) who recommended that learning institution "*invest in infrastructure . . . as needed.*"

For the Thesis Defense Process (TD), the respondents agree that the process was fair and that the examination of their thesis was completed in time. They also expressed satisfaction with the over-all thesis defense process.

Results, as tabulated in Table 3, show that there is no significant difference in the respondents' satisfaction with their research experience at UPHSL CME as indicated by the predictor variables of QS (.910), SD (.567), IC (.374), SI (.965) and TD (.395). All the p-values were higher than the test of significance at 0.05 suggesting no significant difference in the respondents' satisfaction with their research experience in the college. This means that regardless of their degree program, the respondents found their research experience to be satisfying and favorable.

Table 3. Difference in the respondents' satisfaction with research experience when grouped according to their degree program (BSMarE and BS MT)

	QSAve	SDAve	ICAve	SIAve	TDAve
Mann-Whitney U	3313.500	3175.500	3082.500	3334.500	3099.000
Wilcoxon W	5458.500	8531.500	8438.500	5479.500	8455.000
Z	-.113	-.572	-.899	-0.044	-.851
Asymp. Sig. (2-tailed)	.910	.567	.374	.965	.395
Significant @ 0.05					

In terms of improving the research experience, the respondents agree to six (6) recommendations, as shown in Table 4. These recommendations were drawn from verbal suggestions made by CME students during the survey design stage. The results imply that fixed and regular consultation is necessary for better research know-how and productivity followed by

pre-defense examination process (mock defense) which will serve as preparation before the actual

oral defense. Other recommendations, as shown, should be looked into by the school management in order to escalate research practices for the students thereby increasing their research productivity.

Table 4. Student Recommendations to Improve the CME Research Experience

Recommendations	Mean	Interpretation
1. The quality of supervision by thesis adviser may be improved if there are fixed and regular consultation meetings with the adviser.	3.44	Agree
2. To improve the thesis defense process, a pre-defense examination should be scheduled to cover the first part of the thesis.	3.42	Agree
3. Two semesters of research course should be adopted (in lieu of the current one semester course).	3.36	Agree
4. Additional computer access should be made available for research work.	3.36	Agree
5. There should be a limit on the number of advisees assigned to a thesis adviser.	3.33	Agree
6. Research projects should be done individually and not by groups.	3.23	Agree

Conclusions

Results of this research showed that respondents were satisfied with the Quality of Supervision by their thesis adviser (QS), Skill Development (SD), Intellectual Climate (IC), Support Infrastructure (SI), and Thesis Defense Process (TD). Regardless of the respondents' degree program, they found their research experience to be satisfying and favorable.

In terms of improving the research experience, the respondents agreed to six (6) recommendations. School authorities and decision makers are advised to consider adopting any or all of the following recommendations: the quality of supervision by thesis adviser may be improved if there are fixed and regular consultation meetings with the adviser; to improve the thesis defense process, a pre-defense examination should be scheduled to cover the first part of the thesis; two semesters of research course should be adopted (in lieu of the current one semester course); additional computer access should be made available for research work; there should be a limit on the number of advisees assigned to a thesis adviser; research projects should be done individually and not by groups.

Future Directions

Further research on the link between research by college maritime students and faculty research may be undertaken. Further studies should investigate in greater detail the factors affecting research experiences as well as try to uncover other explanatory variables. Another possible research angle could be to investigate factors influencing the intellectual climate (IC) settings as well as measures to improve research support infrastructure (SI). Research on the link between undergraduate research projects and professional advancement is also recommended to gauge the relevance of undergraduate research to alumni's profession.

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