

Traditional e-Learning vs. Immersive Learning: A Perception Study among Maritime Students

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Abstract

e-Learning and immersive learning (i-Learning) are learning methods that focus on the use of technology in the field of education. e-Learning is a traditional learning that supports computer-based teaching while immersive learning is a new strategy that generates an inclusive and interactive learning environment in a virtual reality scene bringing students and trainees to a more experiential-learning workplace. The Philippines is struggling in the field of education because of the decreasing norms of education in the country's education scheme. This research assessed the gap between traditional e-Learning and i-Learning through a questionnaire provided to the second-year maritime students of the Philippine Merchant Marine Academy (PMMA) under deck and engine departments. The data showed that there is a difference between e-Learning and i-Learning but it seems to be not statistically significant. The respondents had perceived that both e-Learning and i-Learning are most advantageous at time-efficiency and least advantageous at cost-effectivity and i-Learning seems to be more interactive and realistic than e-Learning. The results had also shown that the greatest disadvantage of e-Learning is that the method seems to be boring and non-interactive; however, both methods seem to be perceived as expensive. The Connectivism Theory emphasizes that learning is most effective when the learner is willing to learn. It was concluded that either method is supplemental to acquire knowledge and can be used to help create a fair and quality system.

Keywords: *e-Learning, VR, Immersive Learning, Learning Management System*

Introduction

Keeping up through this fast-paced world can be troublesome. There are different aspects of the society that is continuously changing. According to Dr. Richard Wiseman, a British Psychologist, as cited in British Council (2009), the world's pace of life has increased to 10% since the mid-90s and by 20% in other locations. Over the years, the world had undergone a various set of changes. Throughout the discoveries, inventions, wars, and natural phenomena, the world had been in a constant state of change. One of the countries that had experienced this extensive set of changes is the Philippines. The Philippines has a vast history and had been influenced by an abundant number of nations. The country has faced and is still facing a lot of hardships within the society and one of them is education.

One of the struggles within the families in the Philippines is the lack of access to education; according to the Philippines' first multidimensional poverty index (MPI), access to education had been the biggest deprivation within Filipino households and had risen from 36.5% to 36.9% by 2016 and 2017, respectively (Multidimensional Poverty Peer Network, n.d; Valencia, 2018). This meant that 6 in 10 families, in 2016, and 5 in 10 families in 2017 lacked access to basic education. Education is one of the four dimensions of MPI. The remaining dimensions are health and nutrition, housing, and water and sanitation (Vergara, 2018). According to the Philippine Development Plan, 2017-2022, that was published by the National Economic and Development Authority (NEDA, 2017), human capital development is a necessary element to implement the plan; this reform was

implemented due to the declining educational standards in the Philippine education system during the first decade of the 21st century. In the recent report on International Assessment tests, the poor educational performance among Filipino students surfaced, wherein Philippines ranked only 34th among the 38 countries when it comes to Math while 43rd of the 46 countries in high school science (De la Cruz, 2019). Some of the recent education reforms even aspire to boost enrollment levels, graduation rates, and mean years of schooling in both elementary and secondary education, and to improve the quality of higher education (Macha, Mackie, & Magaziner, 2018).

Online learning has been a fast-growing aspect of today's age (Sun & Chen, 2016). Barnard (2017) had cited some key benefits of online learning: more affordable total costs; customizable and varied courses and instructions; accessible anywhere; convenient and flexible immediate results and feedback; and may access the best teachers. As much as online learning is both effective and easy-to-use, Bandard (2017) also mentioned that some barriers hinder online learning, these barriers are lack of accreditation and learner's self-discipline, low retention and completion rates and require good time-management skills, and lack of social aspects of the regular classes.

On the other hand, virtual reality (VR) is described as believable, immersive, computer-generated, and interactive (Lowood, 2019). VR also introduces experiential learning where the learner gets the first-hand experience on the subject through virtual reality. Experiential learning increases this retention rate and it may benefit learners through the following: accelerates learning; provides a safe learning environment; bridges the gap between theory and practice; increases engagement levels; and, assessment of complex learning is easier (Specht, 1985). Virtual reality may also be collaborative which enhances the social aspects of learning like: learn to work with all types of people; the variety of insights, student is actively involved, and personal feedback is encouraged (Barnard, 2017).

This study aimed to find out the difference between traditional e-Learning and immersive learning through the perception of Filipino Maritime students in the Philippine Merchant Marine Academy (PMMA). With the continuous emergence and development of new technology, this research would be engaging for learners who aspire to use technology as a supplemental tool for learning. This had been chosen to research because of its uniqueness through the emergence of e-Learning and its enhanced versions. There is only a selected number of researches or none at all where e-Learning and immersive learning had been involved. This study may also contribute to developing a quality educational management system in line with today's continuously growing technological age. Additionally, this may help in creating and improving, not only quality education, but a fair learning management system.

Objectives

This research would like to determine the difference between traditional e-Learning and i-Learning through the perception of Filipino Maritime students in the Philippine Merchant Marine Academy.

The study aims to specifically answer the following questions:

1. What is the demographic profile of the respondents in terms of:
 - a. Gender
 - b. Department

2. What are the devices most commonly used by the respondents? Particularly:
 - a. Smartphone
 - b. tablet
 - c. Laptop
 - d. PC/Mac
 - e. Game consoles
 - f. Smart watch
 - g. Others

3. What are the advantages of e-Learning and i-Learning? In terms of:
 - a. cost-effectiveness
 - b. interactivity
 - c. Time-efficiency
 - d. realistic

4. What are the disadvantages of e-Learning and i-Learning? In terms of:

a. Understandability	c. Expensiveness
b. Boring	d. interactive

5. Is there a significant difference between e-Learning and i-Learning? In terms of the following:
 - a. This method minimizes the risks (Risk Reduction).
 - b. This method provides guided tours than being taught in a chalk and board scenario (Interactive).
 - c. This method is more fun than a traditional learning environment (Enjoyment).
 - d. This method helps retain more knowledge than the usual classroom environment (Retention).

6. This method would be preferable to be used to teach all of the subjects (Applicability to all subjects).

Theoretical Framework

This research would like to find the difference between traditional e-Learning and i-Learning through the perception of Filipino maritime students. e-Learning methods could be used as a supplemental tool for education. The Hermann Ebbinghaus forgetting curve stated that a learner's absorption rate is at 100% on the first day and loses 50-80% on the second day (Hu et al., 2013), and the retention rate decreases as time passes by, resulting in just 2-3% at the end of thirty days (Barnard, 2017).

According to Siemens (2005), "chaos is a new reality for knowledge workers," as gaining knowledge has started to become obsolete in this digital age. Thus, an alternative learning theory was developed by George Siemens (2005) that may help learners of today adapt to the rapidly changing and developing modern age. Various educational designs had been implemented over the years; one of these is "connectivism." Connectivism Theory is learning theory putting emphasis on the individual as a starting point of learning in the learning cycle (Siemens, 2005, as cited in Kop & Hill, 2008); however, the role of network, especially in the digital age is also vital (Siemen, 2005, para. 8, as cited in Kop & Hill). An individual immersed in a learning community or "nodes" (Downes, 2008, as cited in Kop & Hill, 2008) decides on choices that are based on "rapidly altering

foundations,” founded on an impact of learning as a goal.

With the advancement of technology, a new concept of “schooling, teaching, and learning” was introduced: education 4.0 (Montealegre, 2019). It is one of the technological breakthroughs of this modern age that is the result of various researches and scoping reviews that had been conducted to see the future of education with technology. Additionally, Dadios et al. (2018) mentioned that the country craves for a “solid basic foundation of sustained learning,” and to be able to implement this, the country should be able to bridge the existing technological and knowledge gaps.

The research aims to determine the difference between e-Learning and i-Learning through the perception of Filipino Maritime Students. The research is based on Connectivism Learning Theory that aspires to make learning a “network phenomenon, influenced, aided, and enhanced by socialization, technology, diversity, the strength of ties, and context of occurrence” (Mackness & Schofen, 2012). Additionally, Education 4.0 aims to establish a system with a holistic approach to education aligning with the continuous emergence of technology (“Preparing for Education 4.0,” n.d). With these components, this research may be able to contribute to creating a quality and equitable educational system.

Conceptual Framework

The study targeted to determine the difference between traditional e-Learning and i-Learning through the perception of Filipino maritime students of the Philippine Merchant Marine Academy (PMMA) on Educational Designs. Indicated below is a figure to represent the variables used.

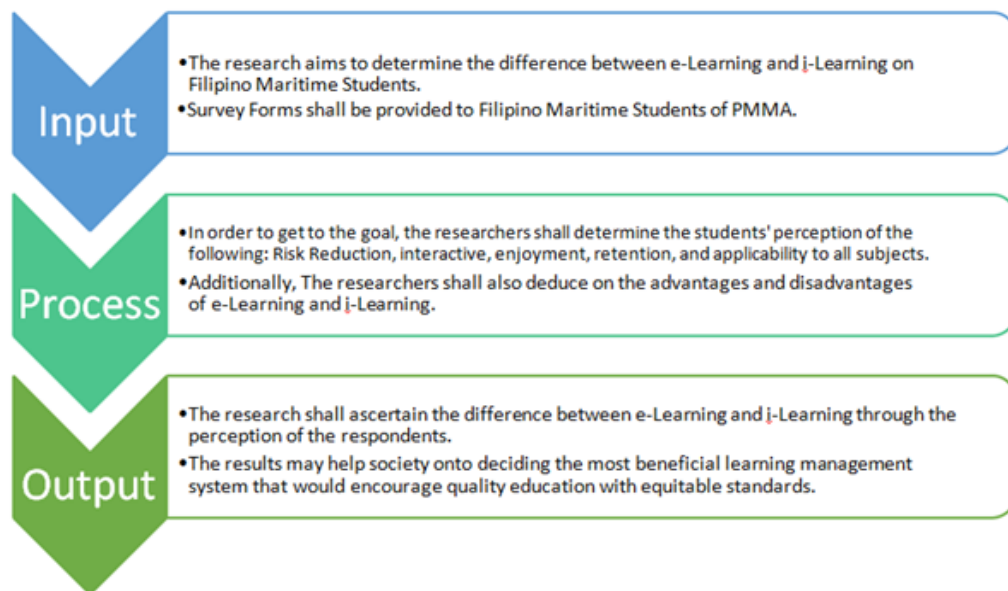


Figure 1. Difference between traditional e-Learning and i-Learning through the perception of Filipino Maritime students

This research determined the difference between traditional e-Learning and i-Learning through the perception of Filipino maritime students on Educational Designs. e-Learning is operationally defined as a comprehensive solution for education that provides competency management

systems with a modularized design that can be accessed through various electronic gadgets such as computers, laptops, tablets, and smartphones. On the other hand, i-Learning is identified as immersive learning. This term is used for a new method for education that creates an integrative and interactive environment for learners. This can also be distinguished as an educational approach to motivate students to learn by using video game design and game elements in learning environments.

This study aimed to acquire the different perceptions of students through a survey. The data collated on the survey was statistically analyzed and interpreted to find out the difference between the traditional e-Learning and immersive learning based on their perceptions. Furthermore, the survey also assessed the perception of students on the advantages and disadvantages of e-Learning and i-Learning.

Methodology

Participants

The participants of this study consisted of 192 maritime students of the Philippine Marine Merchant Academy within deck and engine departments. The research employed convenience sampling method to collect the necessary data.

Maritime students were chosen to be respondents of this research because the maritime focuses on researches on maritime institutions. Maritime industries had also frequently used simulators and various technologies to teach and train their students. These technologies help them to have an overview of what to expect once they board a real ship. This is beneficial for the students who have a brief background on technology-based learning.

Procedure

The study was conducted using a survey form that was answered by the respondents. The data was gathered at the Philippine Merchant Marine Academy (PMMA) in San Narciso, Zambales. Before the distribution of the survey questionnaires, the researchers provided a brief discussion about e-Learning and i-Learning. Once accomplished, the questionnaires were returned immediately to the researchers. The researchers encoded the data that was statistically analyzed.

The following are the statistical treatment provided to analyze the data:

Descriptive Statistics

This statistic had been used to identify the frequency and percentages of the following objectives:

1. What is the demographic profile of the respondents in terms of:
 - a. Gender
 - b. Department
2. What are the devices most commonly used by the respondents? Particularly :
 - a. Smartphone
 - b. Tablet
 - c. Laptop
 - d. PC/MAC

- e. Game consoles
 - f. Smart watch
 - g. Others
3. What are the advantages of e-Learning and i-Learning? In terms of:
- a. Cost-effectiveness
 - b. Interactivity
 - c. time-efficiency
 - d. realistic
4. What are the disadvantages of e-Learning and i-Learning? In terms of:
- a. Understandability
 - b. Boring
 - c. Expensiveness
 - d. Non-interactivity

Multivariate Analysis of Variance (MANOVA)

This statistic had been particularly used to determine the difference between e-Learning and i-Learning among the perception of maritime students within the following terms:

- a. This method minimizes the risks (Risk Reduction).
- b. This method provides guided tours than being taught in a chalk and board scenario (Interactive).
- c. This method is more fun than a traditional learning environment (Enjoyability).
- d. This method helps retain more knowledge than the usual classroom environment (Retention).
- e. This method would be preferable to be used to teach all of the subjects (Applicability to all subjects).

MANOVA had been specifically used to this study due to the number of variables used during the research. The MANOVA is used to take into account the multiple continuous dependent variables and bundle them into a weighted linear combination or composite variable. This statistic determines the difference between groups or levels of the variables. MANOVA essentially tests whether the independent grouping variable simultaneously explains a statistically significant amount of variance in the dependent variable (Tabachnick & Fidell, 2012).

Results and Discussion

This research would like to determine the difference between traditional e-Learning and i-Learning through the perception of Filipino Maritime students. The following figures are the results of the study conducted.

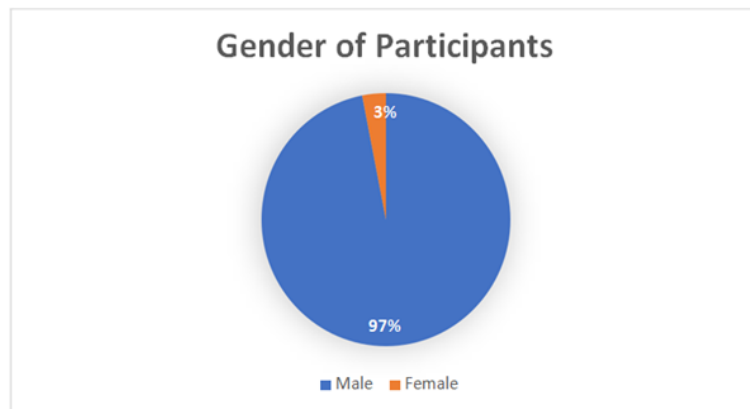


Figure 2.1 Gender of the respondents

Indicated in the figure above is the gender of the 192 respondents during the survey. Almost all (96.4%) of the participants were males and 3.1% were females. The percentage of women seafarers are in constant increase but still at a small percentage. The International Transport Workers' Federation's current statistics represent that women make up only an estimated 2% of the world's maritime workforce (Dragomir & Surugiu, 2013).

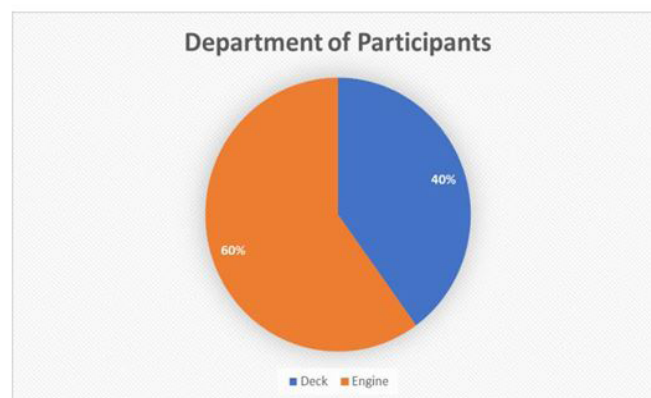


Figure 2.2 Departments of the students

The researchers employed the convenience sampling technique. The result (Figure 2.2) shows that among the 192 students, 60% of them are from the engine department while the remaining 40% are students under the deck department.

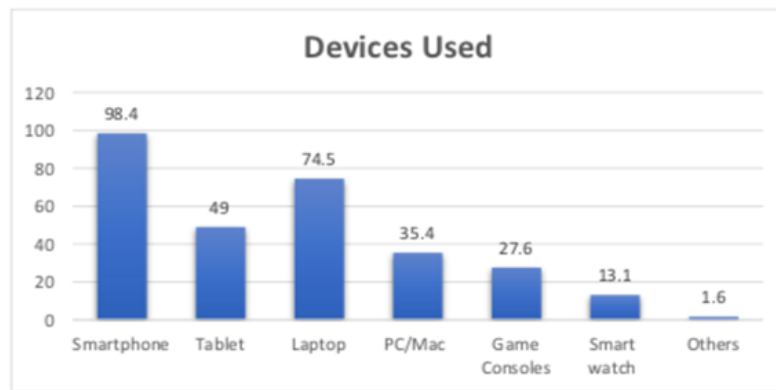


Figure 2.3. Devices commonly used by the respondents

Figure 2.3 shows devices that were commonly used by the participants. It indicates that smartphones (98.4%) had been the most commonly used device among maritime students. Laptop (74.5%) is the second gadget most commonly used by these students. The other remaining devices are tablet (49.4%), PC/Mac (35.4%), game consoles (27.6%), Smart Watch (13.1%) as second to the least number of devices used by the students, and with the least number of device/s used are categorized under “Others” that includes virtual reality (VR) and other devices not included.

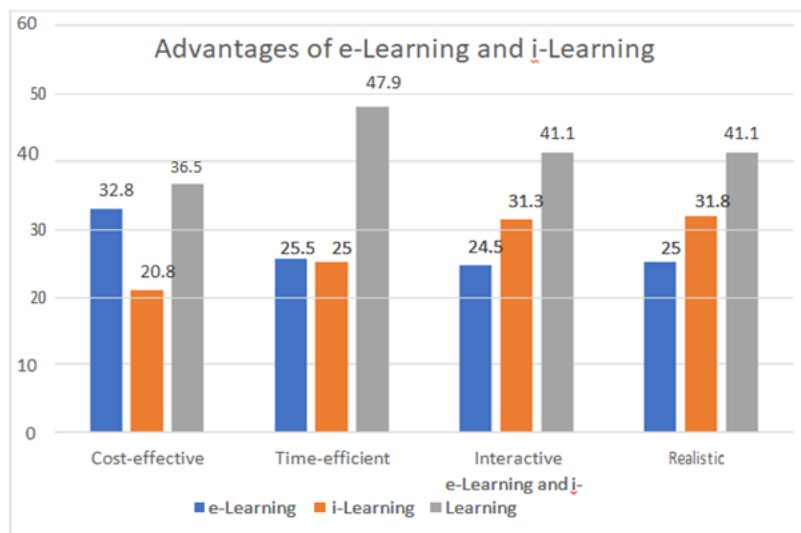


Figure 2.4. The Advantages of e-Learning and i-Learning

Shown in Figure 2.4 are answers given by the students when asked about the advantages of e-Learning and i-Learning. This indicated that time-efficiency is the most advantageous for both e-Learning and i-Learning with 47.9%. Both with 41.1% are interactive and realistic on e-Learning and i-Learning. Also, cost-effectiveness had been the least advantageous of the two factors. i-Learning seems to be more realistic (31.8%) and interactive (31.3%) than e-Learning as perceived by the students. e-Learning, however, is perceived as more cost-effective than i-Learning (32.8%). Lastly, time-efficiency is almost as high on both factors with e-Learning having a .5% difference than i-Learning.

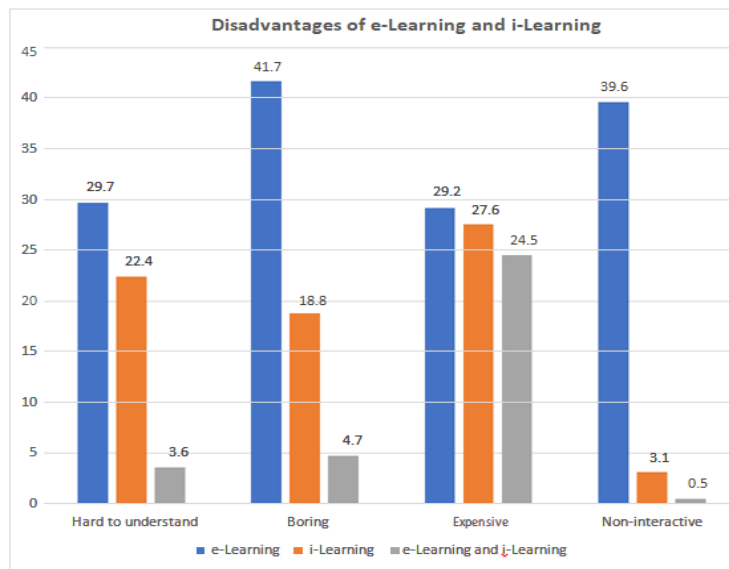


Figure 2.5. The Disadvantages of e-Learning and i-Learning

Figure 2.5 exhibits the disadvantages of e-Learning and i-Learning. Results represent that e-Learning is perceived as boring with 41.7% compared to i-Learning with only 18.8%. It is also non-interactive with 39.6% while i-Learning had 3.1%. e-Learning is also considered to be more expensive (29.2%) and harder to understand (29.7%) than i-Learning (expensive= 27.6% and hard to understand = 22.4%). The participants who perceived that both e-Learning and i-Learning are disadvantageous among the factors are of little percentages only. Particularly, hard to understand – 3.6%; boring – 4.7%; expensive – 24.5% and; non-interactive - .5%. The remaining percentages not counted are those who did not indicate that the factors are disadvantageous for their learning.

Table 1.0. Descriptive Statistics of the Perception of Maritime students on e-Learning and i-Learning

	Descriptive Statistics			N
	Respondents	Mean	Std. Deviation	
Method minimizes risks during training	e-Learning	1.0573	.23301	192
	i-Learning	1.0521	.33535	192
	Total	1.0547	.28838	384
Provide guided tours compared to chalk and board scenario	e-Learning	1.0521	.22278	192
	i-Learning	1.0260	.31432	192
	Total	1.0391	.27238	384
More fun method than traditional learning environment	e-Learning	1.0833	.27711	192
	i-Learning	1.0469	.37303	192
	Total	1.0651	.32867	384
Method that retains knowledge	e-Learning	1.0573	.23301	192
	i-Learning	1.0156	.37565	192
	Total	1.0365	.31286	384
All subjects are taught in this method	e-Learning	1.1667	.40070	192
	i-Learning	1.1406	.48648	192
	Total	1.1536	.44527	384

Table 1.0 indicates that the mean and standard deviation of the respondents on their perception in e-Learning and i-Learning according to Risk Reduction, Interactive, Enjoyability, Retention, and Applicability to all subjects. The standard deviations shown stated that i-Learning seems to reduce risk (0.33535), provide guided tours (.31432), more fun (.37303), retain learning (.37565), and preferred to be taught in all subjects (.48648) than traditional e-Learning.

Table 1.2. Levene’s test of equality of Error Variances

	F	df1	df2	Sig.
Method minimizes risks during training	3.690	1	382	.055
Provide guided tours compared to chalk and board scenario	.821	1	382	.365
More fun method than traditional learning environment	.805	1	382	.370
Method that retains knowledge	2.518	1	382	.113
All subjects are taught in this method	2.014	1	382	.157

* Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Respondents

Meanwhile, Table 1.2 shows the differences between e-Learning and i-Learning according to the following: Risk Reduction, Interactive, Enjoyability, Retention, and Applicability to all subjects. The data appear to have no significant difference on e-Learning and i-Learning with an alpha level of 0.05, in terms of Risk Reduction ($p > 0.055$), Interactive ($p > 0.365$), Enjoyability ($p > .370$), Retention ($p > .113$), and Applicability to all subjects ($p > .157$).

Conclusion and Recommendations

The research would like to identify if there is a significant difference between e-Learning and i-Learning through the perception of Filipino Maritime students. The study had been conducted to 192 maritime students of the Philippine Merchant Marine Academy (PMMA).

In conclusion, the respondents had more males than females. The participants are maritime students of the Philippine Merchant Marine Academy under the deck and engine department, in which the respondents have more engine department students than deck department students. The most commonly used devices by the respondents are smartphones and laptops. Majority perceived that both e-Learning and i-Learning are most advantageous at time-efficiency and least advantageous at cost-effectiveness and the respondents also perceived that i-Learning is more interactive and realistic than e-Learning. The results had also shown that the greatest disadvantage of e-Learning is that the method seems to be boring and non-interactive but both methods seem to be perceived as expensive. Lastly, the data had found that there is a difference between e-Learning and i-Learning but seem to be not statistically significant. e-Learning and i-Learning are new methods to gain knowledge and both are helpful once the individual is properly informed

and committed to it. The Connectivism theory emphasizes that learning is most effective when the learner is willing to learn. Either method is supplemental to acquire knowledge and can be used to help create a fair and quality system.

The researchers recommend that a variety of respondents may help achieve a more significant data, since this study was limited to the perception of Filipino maritime students from PMMA. It is preferable to test a learning management system where more objective data could be gathered than just the perception of students. Future researchers could also focus on one particular factor to emphasize the importance of each factor. Lastly, the researchers recommend that more studies shall be created regarding this subject to help create a system in education with quality and that fits with the modern age but is still encouraging a fair selection and measurement of knowledge.

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