DIGITAL TECHNOLOGY IMPLEMENTATION AND ORGANIZATIONAL PERFORMANCE OF HIGHER EDUCATIONAL INSTITUTIONS IN MARINDUQUE

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Abstract

The educational institution is one of the areas that integrate the use of digital technology in providing quality services to its stakeholders. Likewise, in the mission of the institution understudy on the pursuit of venturing into new frontiers of educational evolution and of entering in the era of the Industrial Revolution, it is timely to assess its digital management of the educational institutions. The evaluation of the extent and impact of this innovation in the educational system drives the researcher to undertake a study on Digital Technology Implementation and Organizational Performance of Higher Educational Institutions (HEIs) in Marinduque. The regular faculty members including the Dean and Department Heads of the institution were the respondents of the study. The study utilized the descriptive and qualitative type of research in assessing the implementation digital technologies and organizational performance of Higher Educational Institution in Marinduque. It was found out that there is a significant difference in the implementation of digital technologies among HEIs in terms of infrastructure, information system, and people. It is revealed also that there is a significant relationship between the performance of HEIs and digital technology implementation. Based on the findings, a framework for Digital Technology Implementation was proposed.

Keywords: Digital technology, digital technology implementation, organizational performance, infrastructure, information system, people, instruction, research, extension, administration

INTRODUCTION

Higher Education Institutions (HEIs) have been permeated by the technological advancement that the Industrial Revolution 4.0 brings with it, and forces institutions to deal with a digital transformation in all dimensions. Digital transformation describes how your organization embraces, utilizes, and remains adaptable to technology that allows you to operate more efficiently and effectively.

Third-world countries, particularly the Philippines, face issues with the integration of technology in education due to insufficient financial resources, a lack of training for faculty and staff, and a lack of human capital (Dotong et al., 2016). The cited challenges may affect the business operations as to the low level of digital technology implementation and capabilities of

technological resources are crucial in the smooth implementation of the different activities particularly in the learning environment.

Likewise, the majority of schools are adopting the idea of incorporating digital technology into the teaching and learning process in the modern educational environment because they believe it is the best method to provide their stakeholders with effective and high-quality services. Some of the problems that many higher education institutions are facing are addressed through the automation process and the deployment of technological platforms. The developments that require attention include those related to learning management systems, office automation, research repositories, online and distance learning, and the like. The transformation in the educational landscape that has been mentioned would affect how well organizations function and provide education. Additionally, this would respond to Sustainable Goal No. 4 of the United Nations, which states that to guarantee high standards of education for all students and encourage lifelong learning, it is necessary to address the proportionately low rates of communication technology proficiency among both young people and adults. For pedagogical purposes, there is widespread access to computers and the Internet (United Nations, 2019). As a result, it is time to adopt the best practices on technological innovations involving education processes.

Statement of the Problem

This research aimed to assess the level of implementation of digital technologies and organizational performance of Higher Educational Institutions in Marinduque and explores the relationship between digital management efficiency and organizational performance. Likewise, intends to develop a framework that would enhance the Digital Technology Implementation of HEIs.

Specifically, it sought answers to the following questions:

1. What is the level of implementation of Digital Technologies in Higher Educational Institutions in terms of:
    1.1 Infrastructure;
    1.2 Information System;
    1.3 People?
2. Is there a significant difference in the level of implementation of Digital Technologies in Higher Educational Institutions when grouped according to Infrastructure, Information System, and People?
3. What is the level of organizational performance of the Higher Educational Institutions when categorized as to HEI's functions:
    3.1 Instruction;
    3.2 Research;
    3.3 Extension;
    3.4 Administration?
4. Is there a significant relationship between Organizational Performance and Digital Technology Implementation?

5. What framework should be developed that would enhance the Digital Technology Implementation of HEIs?

METHODOLOGY

The study utilized a descriptive method of research in assessing the implementation of digital technologies and the organizational performance of Higher Educational Institutions in Marinduque. The study also utilized a qualitative method of research to gather an in-depth understanding of a particular phenomenon or situation. The Higher Educational Institutions in Marinduque served as the locale of the study. The respondents of this study were the regular faculty members in the said HEI's who were selected using a purposive sampling technique. These respondents were chosen because they have direct access to or usage of digital technology resources to carry out their duties and responsibilities in the school's operation. A total of 85 faculty members served as the respondents of the study. A validated instrument was used in gathering the data needed for the study. To attain the necessary output, the data were analyzed with the use of different statistical tools such as Frequency, Percentage, and Mean. Likewise, Analysis of Variance (ANOVA) was used to determine the significant differences in the implementation of Digital Technologies, and Spearman's Rho was employed to test if there is a significant relationship between organizational performance and digital technology implementation. In this study, the data were analyzed using the Statistical Package for Social Science v.23 (SPSS 23). Furthermore, the data gathered were scaled using the "five-point-scale system", "four-point-scale system" and "three-point-scale system" or Likert Scale System.

RESULTS AND DISCUSSION

This research aimed to assess the level of implementation of Digital Technologies and Organizational Performance of Higher Educational Institutions in Marinduque and explores the relationship between digital management efficiency and organizational performance. Likewise, intends to develop a framework that would enhance the Digital Technology Implementation of HEIs. This study sought to answer the following: 1) The level of implementation of Digital Technologies in Higher Educational Institutions in terms of: 1.1 Infrastructure; 1.2 Information Systems and 1.3 People; 2) Significant difference in the level of implementation of Digital Technologies in Higher Educational Institutions when grouped according to Infrastructure, Information System, and People; 3) Level of organizational performance of the Higher Educational Institutions when categorized as to HEI's functions: 3.1 Instruction; 3.2 Research 3.3 Extension and 3.4 Administration; 4) Significant relationship between the Organizational Performance and Digital Technology Implementation and 5) Framework that should be developed that would enhance the Digital Technology Implementation of HEIs.

Based on the data gathered, the following findings were drawn.

1. The level of digital technology implementation showed the following:

1.1. In terms of Infrastructure

1.1.1 The use of Digital Infrastructures in the delivery of their service in instruction got a mean of 3.10, and a verbal interpretation of **"To a Moderate Extent".** While in the delivery of their service in Research, the result shows a Grand mean of 1.64 with a verbal description of **"To the Least Extent"** and in Extension result shows a Grand mean of 1.58 with a verbal description of **"To the Least Extent."**

1.1.2 In the summary of how frequently HEIs are using Digital technologies in the delivery of their service in instruction, HEIs obtained a grand mean of 2.35 with a verbal description of **"To a Moderate Extent"**. In Research, the results show a grand mean of 1.25 with a verbal description of **"To the Least Extent"** and in Extension result shows a grand mean of 1.26 with a verbal description of **"To the Least Extent".**

1.2 In terms of Information System

1.2.1 It is revealed in the summary of when the HEIs are using Information Systems in the delivery of their services. In Instruction, HEIs obtain a grand mean of 2.2 with a verbal description of **"To Some Extent"**. In Research, it revealed the grand mean of 1.3 with a verbal description of **"To the Least Extent"** and a grand mean of 1.2 with a verbal description of **"To the Least Extent"** in Extension.

1.2.2 In the summary of how frequently HEIs are using Information Systems, it revealed a grand mean of 1.7 with a verbal description of **"To the Least Extent"** in the delivery of Instruction. It is revealed also that Research obtained a grand mean of 1.2 with a verbal description **of "To the Least Extent"** as well as in Extension with a grand mean of 1.1 and a verbal description of **"To the Least Extent".**

1.3. In terms of People

The study assessed the frequency of training received by the faculty and how frequently they are being monitored and evaluated in the use of digital technologies in the delivery of their services.

1.3.1 Based on the data gathered, it revealed that in Instruction, 54 or 63.5% of the Faculty received training in the use of Digital Technologies in Instruction **once a semester.** The remaining 26 or 30.6% received training **twice a semester** and 5 or 5.9% **never** received training.

1.3.2 It showed also that in Research or 22.59 % received training in the use of Digital Technologies **once a semester.** The remaining 6 or 7.1% received training **twice a semester** and the majority of 57 or 67.1 % **never** received training.

1.3.3 In Extension, 15 or 17.6 % of the Faculty received training in the use of Digital Technologies **once a semester**. The remaining 4 or 4.7% received training **twice a semester** and the majority of 66 or 77.6 % **never** received training.

1.3.4   As a result of the frequency of monitoring and evaluation about the progress and effectiveness of the implemented digital technologies in the delivery of services in Instruction, findings revealed that 59 or 69.4 % of the Faculty are being monitored and evaluated s in the use of Digital Technologies **once a semester**. The remaining 3 or 3.5 % received training **twice a semester** and 23 or 27.1 % are **never** monitored and evaluated.

1.3.5   The data also showed that 12 or 14.1 % of the Faculty are being monitored and evaluated s in the use of Digital Technologies in Research **once a semester**. The remaining 3 or 3.5 % received training **twice a semester** and the majority of 70 or 82% are **never** monitored and evaluated.

1.3.6   Moreover in Extension, data revealed that 12.0 or 14.1% of the Faculty are being monitored and evaluated s in the use of Digital Technologies **once a semester**. The remaining 3 or 3.5 % received training **twice a semester** and the majority of 70 or 82.4 % are **never** monitored and evaluated.

2. Results in the Significant Differences in the Implementation of Digital Technologies when grouped according to Infrastructure, Information System, and People revealed the following:

2.1 In terms of Infrastructure

The findings revealed that there is a significant difference in how long Digital Technologies are used in Instruction, Research, and Extension among the 4 HEIs in the Province at 0.01 level of significance. Results revealed also that there is a significant difference in how frequently HEIs used Digital Technologies in Instruction, Research, and Extension at an alpha level of 0.01.

2.2 In terms of Information System

Findings revealed that there is a significant difference in how long the Information Systems are used among the HEIs in Instruction, Research, and Extension at an alpha level of 0.01. Likewise, there is a significant difference in how frequently HEIs used Information Systems in Instruction, Research, and Extension at an alpha level of 0.01.

2.3 In terms of People

Results revealed that there is a significant difference in the frequency of Training received by the Faculty on the use of Digital Technology to be used in Instruction, Research, and Extension at an alpha level of 0.01 Also, data revealed that there is a significant difference in the Frequency of Monitoring and Evaluation of the Progress and Effectiveness of the implementation of Digital Technology in the delivery of services in Instruction, Research and Extension at an alpha level of 0.01.

3. Level of Organizational Performance of HEIs showed the following:

3.1 Instruction

3.1.1. It revealed that there is a 30.3% increase in the number of enrollees in the year 2020 and a 22.7% increase in the year 2021. It also shows that the highest number of enrollees is from HEI-1 with 18,494 or 76.4%. It is followed by HEI-3 with 3,400 or 14.0%. The remaining 1,559 or 6.4% is from HEI -4 and 3,400 or 3.2% is from HEI-2.

3.1.2 Results showed the average passing rate of each HEIs in the Licensure Examination from 2019, 2021, and 2022. HEI-1 got the highest average rate of 66.8%, followed by HEI-3 second to the highest with the average rate of 65.6%. Third to the highest is HEI-4 with an average rate of 30.1% and last to the highest is HEI-2 with an average rate of 30.0%. It also revealed that the year 2022 got the highest average passing rate of 52.4%. Likewise, it also shows that there is a yearly increase in the average passing rate among HEIs.

3.1.3 The result showed the HEI's employment rate of graduates within the first two (2) years after graduation. It revealed that 79.9% of graduates are employed within the first 2 years after their graduation.

3.1.4 All of the HEIs that participated in this study are recognized by the Commission of Higher Education. HEI is SUC Level III Accredited and the majority of the programs and accredited by the AACUP. Likewise, HEI-1 and HEI-4 have Certification of ISO 9001:2015. HEI-2 and HEI-4 are planning to apply for accreditation by the PAASCU.

3.2 Research

3.2.1 The data gathered revealed that among the HEIs, only HEI-1 has the results in the Research function from 2019-2021. In the year 2019, there is 60 research outputs completed, 61 research completed in the year 2020, and 62 research completed in the year 2021. In the Percentage of research outputs presented in national, regional, and international fora within the year, the study found that 100% is presented in the year 2019, 100.56% was presented in the year 2020, and 101.10% was presented in the year 2021. It also found that 11 research outputs are utilized by the industry or by other beneficiaries in the year 2019-2021.

3.2.2 Based on the interview with the faculty among HEI-1, HEI-2, and HEI-3, they are more focused on the function of Instruction. It can be seen also in the result of the implementation of digital technology in terms of Infrastructure, Information Systems, and People that they are utilizing technologies in the delivery of their services in Instruction.

3.2.3 The study conducted also showed that among the HEIs, there are only results from HEI-1. The remaining HEIs are more focused on the Instruction function. The result shows that HEI-1 has a total of 3,313 trainees weighted by the length of training in the year 2019. In the year 2020, it has a total of 3,678.5, and 3,327 in the year 2021. Likewise, it reveals that in the year 2019, there is 88.52% in the percentage of partners rate the training course/s and advisory services as satisfactory or higher in terms of quality and relevance. In the year 2020, there is a result of 89.55% and 89.88% in 2021. Moreover, there are a total of 23 partnerships with LGUs, industries, NGOs, NGAs, SMEs, and other stakeholders as a result of extension activities in the year 2019-2021.

3.3 Extension

3.3.1 The result showed that among the HEIs, there are only results from HEI-1. The remaining HEIs are more focused on the Instruction function. The result shows that HEI-1 has a total of 3,313 trainees weighted by the length of training in the year 2019. In the year 2020, it has a total of 3,678.5, and 3,327 in the year 2021. The result revealed that in HEI-1, in the year 2019, there is 88.52% in the percentage of partners rate the training course/s and advisory services as satisfactory or higher in terms of quality and relevance. In the year 2020, there is a result of 89.55% and 89.88% in 2021.

3.3.2 HEI-1 has a total of 23 partnerships with LGUs, industries, NGOs, NGAs, SMEs, and other stakeholders as a result of extension activities in the year 2019-2021.

3.3.3 The result showed that HEI-1 has a stronger performance in the Extension Function compared to the other HEIs. The consistently high ratings from partners and the number of partnerships indicate that HEI-1 is successfully fulfilling its role in engaging with the community and industry partners. On the other hand, the lack of data from the other HEIs regarding their Extension Function suggests that they may not be as actively involved in this aspect of institutional performance.

3.4 Administration

Findings revealed that HEI Administration is providing training and monitoring the progress of the use of digital technologies in HEIs, especially in the instruction function. However, it is also important to note that the implementation of digital technologies should not be limited to instruction only but should also be extended to research and extension functions. This will allow HEIs to have more efficient and effective processes and better engagement with their stakeholders.

4. Significant Relationship between the Performance of HEI and Implementation of Digital Technologies

4.1 Findings revealed that there is a weak and negative relationship and not statistically significant in the performance of HEIs in terms of Number of Enrollment, Percentage Passing in Licensure Exam and Employment of Graduates, and how long and how frequently HEIs have been using Digital Technologies in terms of Infrastructures in Instruction.

4.2 The result showed that there is a positive relationship in the performance of HEIs in terms of the Number of Enrollment and Percentage Passing Licensure Exams and how long and how frequently HEIs have been using Digital Technologies in terms of Infrastructures in Research and Extension.

4.3 The result showed that there is a negative relationship between the Performance of HEI in terms of the Employment of graduates and how long and how frequently HEIs have been using Digital Technologies in terms of Infrastructures both in Research and Extension.

4.4 The result showed that there is a positive relationship in the performance of HEIs in terms Number of Enrollments and Percentage Passing in Licensure Exams and how

long and how frequent HEIs have been using Digital Technologies in terms of Information Systems in Instruction, Research, and Extension.

4.5 The result showed there is a negative relationship in the Performance of HEI in terms of Employment of Graduates how long and how frequent HEIs have been using Digital Technologies in terms of Information Systems in Instruction, Research, and Extension.

4.6 Findings revealed that there is a weak and negative relationship in the performance of HEI as indicated by the number of enrollees, percentage passing in the Licensure Exam Employment of Graduate, and the frequency of training received by the Faculty in Instruction.

4.7 Findings revealed that there is a positive relationship between the performance of HEI as indicated by the number of enrollees and percentage passing in the Licensure Exam and the frequency of training received by the Faculty in Research and Extension.

4.8 Findings revealed also that there is a negative relationship between the performance of HEI as indicated by the Employment of Graduates and the frequency of training received by the Faculty both Research and Extension.

4.9 The result showed that there is a positive relationship as indicated by the Number of Enrollees and Percentage Passing in the Licensure Examination and the Frequency of Evaluation and Monitoring of the Progress and Effectiveness of the Implemented Digital Technologies in Instruction.

4.10 Results revealed that the frequency of Monitoring and Evaluation of the Implemented Digital Technologies in Instruction is not statistically significant if the Performance of HEI in terms of Employment of Graduate.

4.11 Findings revealed that there is a positive relationship as indicated by the Number of Enrollees and Percentage Passing in the Licensure Examination and the Frequency of Evaluation and Monitoring of the Progress and Effectiveness of the Implemented Digital Technologies in Research and Extension.

4.12 Results revealed that the frequency of Monitoring and Evaluation of the Implemented Digital Technologies in Research and Extension has a negative relationship with the Performance of HEI in terms of Employment of Graduates.

5. Proposed Digital Technology Implementation Framework

Figure 1

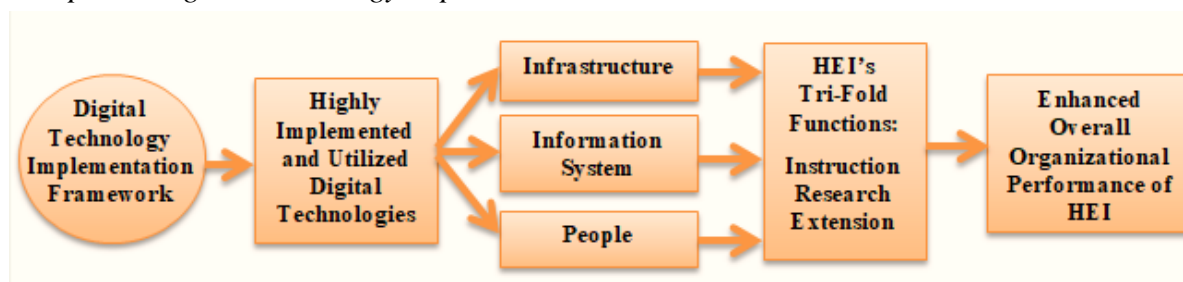*Proposed Digital Technology Implementation Framework*

Figure 1 shows the proposed Digital Technology Implementation framework that is conceptualized based on the findings of the study. The framework incorporates the Implementation and Utilization of Digital Technologies in terms of Infrastructures, Information Systems, and People in the HEI's functions of Instruction, Research, and Extension that would enhance the organizational performance.

Infrastructure: The infrastructure component of the framework includes the physical and technical infrastructure that is required to support the implementation of digital technology. This includes hardware, software, networks, and other resources necessary to support the effective use of digital technology in the HEI.

Information System: The information system component of the framework includes the digital systems and tools that are used to manage and process information within the HEI. This includes systems for managing student records, financial information, research data, and other important information.

People: People are at the heart of any Digital Technology Implementation, and it is important to ensure that faculty, staff, and students are engaged and have the necessary skills to use digital technology effectively. This may involve providing training and professional development opportunities, as well as creating a culture of innovation and collaboration.

Instruction: Digital Technology can enhance the teaching and learning experience, and it's important to incorporate it into instruction in a way that aligns with the goals and objectives of the institution. This may involve the use of learning management systems, online courses, and digital resources to support student engagement and learning outcomes.

Research: Digital technology can support research by enabling collaboration and data sharing, as well as providing access to research tools and resources. This may involve the development of digital repositories, data analytics platforms, and virtual research environments.

Extension: Digital technology can also support the extension function of the institution by enabling engagement with external stakeholders, such as industry partners and community organizations. This may involve the use of digital marketing tools, social media, and online events to reach a wider audience and enhance the impact of the institution's activities.

Overall, this framework is designed to provide a holistic approach to digital technology implementation that incorporates the people, infrastructure, and information systems required to support the various functions of a Higher Educational Institution.

CONCLUSION

Based on the data, it can be concluded that among the infrastructures and personnel of HEIs, digital technologies are used most frequently in instruction and least frequently in research and extension. Digital technologies are used to some extent in instruction and to a lesser amount

in research and extension in terms of information systems. The null hypothesis is disproved since there are notable variations in how digital technologies are applied across HEIs in terms of infrastructure, information systems, and personnel. The institutional effectiveness of HEIs in Marinduque is excellent in the teaching function and fair in the research and extension functions. Further, HEI-1 is actively performing in Tri-Fold Functions, while the other HEIs are more focused on the Instruction function. There is also a significant relationship between the performance of HEIs in Instruction and the use of Digital Technologies in terms of Infrastructure, Information Systems, and People. The Digital Technology Implementation Framework was proposed to improve the implementation and performance of the HEIs in Marinduque.

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