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Digital Era Readiness and Leadership and Management Competencies of School Heads in the Schools Division of Marinduque

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Abstract: ***This study focuses on the digital era readiness in terms of digital leadership and digital skills and school leadership and management competencies of school heads in the Schools Division of Marinduque which is anchored on the undeniable need for competent school leadership and management that can effectively satisfy the complex and multi-layered requirements of the Education 4.0 era. This validates the need for anything 'new' in school leadership and management capacity of school heads, particularly in terms of their ability to effectively lead transformation in schools.***

The study employed 176 elementary and 46 secondary school heads during School Year 2020-2021 and used quantitative research design with frequency, ranking, mean and Mann-Whitney, Kruskal-Wallis and Spearman-Rho as statistical tools. An online researcher-made questionnaire was used in the gathering of data.

Result of the study reveals that school heads are approaching readiness (3.92) in the digital era of Education 4.0 as manifested by their digital leadership (3.94) and digital skills (3.90). They also exhibited moderate proficiency (4.04) in the execution of their leadership and management competencies in five domains as expected in the Philippine Professional Standards for School Heads (PPSSH). Meanwhile, a significant relationship (P-value: 0.000) was noted between their digital era readiness and their leadership and management competencies.

In view of the results, it is highly recommended to strengthen the leadership and management preparation and competencies of school heads aligned with the domains and strands of PPSSH by including the use of digital technology not just to enhance their educational leadership content delivery but to transform the content itself.

Keywords: Digital Era, Digital Leadership, Digital Skills, Education 4.0, Philippine Professional Standards for School Heads (PPSSH)

I. INTRODUCTION

Rapid advances in technology appear to be affecting every aspect of one's lives, including leadership and educational institutions around the world. The social, economic, ecological, and cultural components of existence have all been revolutionized by innovative technology. Education 4.0 is meant to satisfy these new expectations, allowing the education sector to remain current and effective in the face of rapid change. In the Philippines, the Department of Education faces tremendous changes and challenges in preparing students for changing educational demands in the era of Education 4.0, as schools are at the heart of education, has given new impetus to educational transformation.

As a main driver of change in school reform, school administrators face the challenging task of developing an effective learning ecosystem to prepare students for the Industrial Revolution 4.0. External pressures must be balanced against the crucial need to reorganize and reengineer schools in terms of teaching and learning. As a result, the ability to act, rather than the ability to think, is the most important quality for effective school leadership and management. The success or failure of these initiatives will determine not only the destiny of the learners, but also the future of the entire country. As a result, there is an undeniable need for competent school leadership and management that can effectively satisfy the complex and multi-layered requirements of the Education 4.0 era. This validates the need for anything 'new' in school leadership capacity, particularly in terms of their ability to effectively lead transformation in schools. Exceptional technology leadership calls for excellent people skills, communication skills and technology skills. A school leader must make use of digital leadership and management skills to assist an organization in utilizing fast-changing technology in decision-making, policy-making and facilitate changes in school as well as incorporate and utilize diverse solutions in teaching, learning and school administration.

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The challenge for the Department of Education (DepEd) as reflected on its mission and vision is on how to produce graduates with creative ideas and relevant skills to operate in this digital world, while contributing to the organizational functioning through leadership, management, and supervisory functions of the school heads. DepEd focused itself towards the transformation of education through the DepEd Computerization Program (DCP), following the legal duty of promoting the right of all citizens to take proper actions in making education accessible to everyone The aim is to provide public schools with the right skills to improve their education and learning processes and meet the challenges of the 21st century (DepEd Order No. 78, s. 2010).

In addition, DepEd's Accelerated DepEd Computerization Program (DCP) paved the way for the creation of Public Schools of the Future, the Digital Rise Program. This was launched on March 12, 2019 during the 1st DepEd Cyber Expo which aims to promote and solidify the innovation and digitization project that will support the K-12 Curriculum's needed requirements in delivering a quality, accessible, relevant, and liberating education for all. The key success of this program targets the different components and facets of skills development which will enable the technological advancement of infrastructure and info-structure. Alongside of which is the empowerment training program in using ICT effectively in any type of learning environment which is the most essential ingredient in making this transformational framework revolutionize the traditional practices of Philippine education.

Furthermore, changes brought about by various national and global frameworks such as the K–12 Basic Education Program, ASEAN Integration, globalization, and the changing character of 21st century learners prompted DepEd's commitment to support school heads so that they can perform their roles in schools, including improving teacher quality and, as a result, learner achievement, resulting in the issuance of National Implementation of the Philippine Professional Standards for School Heads (PPSSH), (DepEd Order No. 024 s. 2020).

Although the necessity for good school leadership and management in the era of Education 4.0 is widely recognized, there is far less certainty regarding which leadership and management practices are most likely to achieve positive results. Indeed, to equip school leaders with the necessary competencies to lead school change, a reliable and valid model to identify those important leadership and management competencies that may enable school leaders to evaluate school improvement and effectiveness is required.

Despite the fact that multiple studies have proven that school leaders' leadership promotes the integration of educational technology, which has a positive impact on student success, there is a scarcity of research on school leaders' digital leadership. Accordingly, it is the role of school administrators to become active technology leaders who are the driving force behind technology integration in schools.

This situation has demanded a greater examination of school leaders' competencies in this era of Education 4.0, as school leadership and management are strong predictors of effective school change.

To this aim, the question is whether Filipino school leaders, notably those from the Schools Division of Marinduque, are adequately competent to lead school change and successfully transform the school system.

These scenarios prompted the researcher to conduct this study to determine the digital era readiness of elementary and secondary school heads through the investigation of their digital leadership and digital skills, their leadership and management competencies, the SBM level of practice and its relationship with one another to come up with a school leadership and management competency model in the digital era of Education 4.0 towards an effective and efficient management of schools in the Schools Division of Marinduque given the current educational landscape in the Philippines today.

A. Statement of the Problem

1) What is the level of school heads' digital era readiness in terms of the following when grouped according to their demographic profile:

a) Digital leadership;

- Leadership and Vision;
- Teaching and Learning;
- Productivity and Professional Practice;
- Support, Management and Operations;
- Assessment and Evaluation; and
- Social, Legal and Ethical Issues?

b) Digital skills?

2) How may the level of school heads' leadership and management competencies be described in terms of the following Philippine Professional Standard for School Heads (PPSSH) domains when grouped according to their demographic profile:

- Leading strategically;
- Managing school operations and resources;
- Focusing on teaching and learning;
- Developing self and others; and
- Building connections?

3) Is there a significant relationship between the school heads' digital era readiness and their leadership and management competencies; and

4) Based on the results of the study, what model could be proposed to meet the changing education needs in school leadership and management in the digital era of Education 4.0?

II. METHODOLOGY

A. Research Design

This study used quantitative design. The study adopted the descriptive-correlational type of research as it primarily aims to determine the digital era readiness of elementary and secondary school heads in terms of their digital leadership and digital skills and their leadership and management competence as described in the Philippine Professional Standards for School Heads (PPSSH). It is descriptive because the study answers the following concerns: describe the demographic profile of elementary and secondary school heads and determine their digital era readiness and their leadership and managerial competencies as indicated in Philippine Professional Standards for School Heads (PPSSH) and it is correlational because it described the relationship among the demographic profile of the school heads and their digital era readiness, and their school leadership and management competencies.

B. Research Locale

The study was conducted in the Schools Division of Marinduque, one of the seven (7) schools division in MIMAROPA Region, to 176 elementary schools and 46 secondary schools from the nine districts in the whole division. These schools are found in the six municipalities of the Province of Marinduque (Figure 2). Each municipality has one district except for the Municipality of Boac, having two districts (Boac North and Boac South) and the municipality of Santa Cruz which is composed of three districts namely; Santa Cruz East, Santa Cruz North and Santa Cruz South, for a total of nine districts in the whole Division.

The Schools Division of Marinduque is the research locale of the study as this highlighted the efforts and synergy of elementary and secondary school heads in making their schools a potential place for every learner through their leadership and management competencies embedded in their digital era readiness.

The study utilized an online self-made questionnaire/checklist as the main instrument to generate data from the target respondents adapted from the related studies reviewed. The online survey-questionnaire was composed of three parts.

1) Part 1 is the School Heads' Digital Era Readiness Checklist. This part described the level of digital era readiness of school heads in terms of their digital leadership and digital skills. Digital Leadership is composed of six sub-sections. Each section is made up of 10 indicators while Digital Skills is composed of 25 indicators with a total of 95 indicators.

2) Part 2 is the School Heads' Leadership and Management Competencies Checklist. This part described the level of leadership and management competencies of school heads as indicated in the Philippine Professional Standards for School Heads (PPSSH).

This part is composed of five domains with seven strands for Domain 1, six strands for Domain 2, eight strands for Domain 3 and Domain 4 and five strands for Domain 5 with a total of 34 strands

C. Data Gathering Procedure

In preparation for the conduct of the study, a letter of request was sent to the Schools Division Superintendent for her approval to conduct the study in the Schools Division of Marinduque. The approved letter request was then sent to the nine (9) Public Schools District Supervisors to allow the school heads to participate in the study.

Pre-testing was done to check if the items in the survey-questionnaire were clear and understandable to a group of school heads who were not included in the actual administration. This was done to evaluate the reliability and validity of the survey instrument prior to the final use to the target elementary and secondary school heads.

A reliability test was conducted to the 10 private schools' school heads in the Schools Division of Marinduque and resulted to a Chronbach's Alpha result of 0.972586875 which proved to be reliable.

To test the validity of the instrument used, the questionnaire was validated by a group of experts in Philippine Professional Standards for School Heads (PPSSH) and Information Technology (IT). The Chief of School Governance and Operations Division (SGOD), Education Program Supervisor on Special Programs and Projects (SGOD), Division Math Supervisor, Division English Supervisor and Division Information Technology Officer comprised the team of experts who examined the questionnaire for the improvement of the instrument before its final use in the research study.

This study employed the use of a survey-questionnaire developed by the researcher with the informed consent of all the respondents. The research questions were addressed through an electronic web-based self-reported survey. The web-based survey through Google Forms using the link *https://tinyurl.com/2021Alcantara* consisted of 2 parts with 85 questions for digital era readiness subdivided into 60 questions for digital leadership and 25 questions for digital skills and 34 questions comprising the 5 domains and strands under leadership and management competencies with a total of 129 questions. The respondents selected the statement that best described their actual practice and beliefs.

The target respondents were informed that the Google Form link will be open from April to May 2021. Responses were then downloaded in a Microsoft Excel Format after the link was closed for data analysis.

After the gathering of data, results were analyzed using frequency, percentage, mean, rank and Spearman-Rho, Mann-Whitney, and Krussal-Wallis.

III. RESULTS AND DISCUSSION

Table 1.1
School Heads' Digital Leadership in Terms of Leadership and Vision

I. Leadership and Vision	Mean	VD	Rank
1. Facilitate the shared development by all stakeholders of a vision for technology use and widely communicate that vision	3.68	AR	9.5
2. Maintain an inclusive and cohesive process to develop, implement and monitor a dynamic, long range and systemic technology to achieve that vision	3.71	AR	8
3. Foster and nurture a culture of responsive risk-taking	4.20	AR	3
4. Use data in making leadership decisions	4.23	AR	2
5. Advocate for research-based effective practices in use of technology	4.00	AR	6
6. Advocate for policies, programs and funding opportunities that support the implementation of the school technology plan	3.68	AR	9.5
7. Ensure that all components of the school or district technology plan are aligned to and integrated with school improvement plans	3.89	AR	7
8. Has mindful approach towards the effects of digital technologies in the organization	4.17	AR	4.5
9. Invest in own personal exploration and use of new digital tools	4.34	AR	1
10. Lead a proper way of using digital technology in schools	4.17	AR	4.5
Average Mean	**4.01**	**AR**	

Legend: R – Ready
DR – Developing Readiness
NR – Not Ready
AR – Approaching Readiness
BR – Beginning Readiness

Table 1.1 presents the digital era readiness of school heads in terms of the first indicator under digital leadership which is *leadership and vision*. It shows how the school heads' mean for every indicator with verbal description and were ranked according to their responses.

Upon analysis of the data, it only shows that to become digital era ready, school heads ranks first in investing in own personal exploration and the use of new digital tools with a mean of 4.34 which falls under *approaching readiness* while facilitating the shared development by all stakeholders of a vision for technology use and widely communicate that vision and advocating for policies, programs and funding opportunities that support the implementation of the school technology plan both with a mean of 3.68 and still falls under *approaching readiness* ranked last. Furthermore, the first indicator has an average mean of 4.01 and can be verbally described as approaching readiness.

Further analysis of the data reveals that the school heads' first step in their preparation for the digital era is by having an insight on the needs of the organization and individuals in a digital education landscape thereby investing first in different digital tools and see how digital tools, networks and associated structural changes impact on their organization and the work people do and can thereby make appropriate critical decisions.

The findings also show that for educational leaders to become catalysts for inspiring a shared vision for comprehensive technology integration and foster an environment and culture conducive to realizing that vision is an affirmation of the study of Hamzah (2014), that a principal's leadership is a key influence on the school's effectiveness. Furthermore, the fundamental role of the technology leader, is to define the relationship between technology, vision, and school mission, as well as educational policy. Lin's (2016) results that principals were less effective in developing visionary leadership, a digital age learning culture, and systemic transformation are supported by this research.

Table 1.2
Digital Leadership of Schools Heads in Terms of Teaching and Learning

II. Teaching and Learning	Mean	VD	Rank
1. Identify, use, evaluate, and promote appropriate technologies to enhance and support instruction and standards-based curriculum leading to high levels of student achievement	3.91	AR	6
2. Facilitate and support collaborative technology-enriched learning environments conducive to innovation for improved learning	3.96	AR	3.5
3. Provide for learner-centered environments that use technology to meet the individual and diverse needs of learners	3.87	AR	7
4. Facilitate the use of technologies to support and enhance instructional methods that develop higher-level thinking, decision-making and problem-solving skills	3.95	AR	5
5. Encourage teachers to use technology in ways that support collaborative learning environments	4.42	AR	1
6. Promote student use of technology that promote analysis, synthesis and evaluation	3.86	AR	8
7. Employ a variety of strategies to ensure that faculty can clearly articulate how technology is to be integrated across curricular areas	3.99	AR	2
8. Ensure that students have adequate access to appropriate technologies that support learning goals	3.65	AR	10
9. Observe students in the classroom and then provide feedback to teachers regarding effective uses of technology in the learning environment	3.84	AR	9
10. Promote a better and greater use of e-teaching and learning	3.96	AR	3.5
Average Mean	**3.94**	**AR**	

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Table 1.2 presents the digital era readiness of school heads in terms of the second indicator under digital leadership which is teaching and learning. It shows how the school heads' mean for every indicator with verbal description and were ranked according to their responses.

The table reveals that to become digital era ready, school heads prioritize first in encouraging the teachers to use technology in ways that support collaborative learning environment with a mean of 4.42 which falls under *approaching readiness* while ensuring that students have adequate access to appropriate technologies that support learning goals with a mean of 3.65 and still falls under *approaching readiness* ranked last. Furthermore, the second indicator under digital leadership has an average mean of 3.94 and can be verbally described as approaching readiness.

According to Hoedi and Wahyudi (2017), one of the school principal's responsibilities as a technology leader is to provide professional development opportunities for teachers and staff that emphasize the use of technology and enable its integration into a collaborative atmosphere. This contradicts Ghamrawi's (2013) study, which identified a slew of obstacles to effective ICT integration in schools, with school leadership topping the list. Furthermore, Hoedi and Wahyudi (2017) reveals that school leaders still have a low level of ICT implementation competency within the school leadership paradigm. They argued that head teachers needed support and formal training in order to integrate ICT into their administrative and decision-making activities, not just for teaching and learning. The study further validates the study of Lin (2016) which shows principals' utilized hybrid ways to support the teachers' communication and collaboration and personalized professional development.

The outcome also demonstrates that this is in line with the Philippine government's policy on the use of ICT to encourage educational communities to adopt a 21st-century learning methodology. Without a doubt, school leaders have an impact on digital era practices and advances that are ingrained in students' learning processes as well as staff and teacher experiences.

Table 1.3
Digital Leadership of School Heads in Terms of Productivity and Professional Practice

III. Productivity and Professional Practice	Mean	VD	Rank
1. Engage in sustained, job-related professional learning using technology resources	3.96	AR	9
2. Maintain awareness of emerging technologies and their potential uses in education	4.16	AR	3
3. Use technology to advance organizational improvement	4.09	AR	4
4. Use technology to communicate with students, parents, and community members	4.28	AR	1
5. Ensure that professional development is based on evaluations of staff knowledge, skill, and performance in using technology	4.08	AR	5
6. Establish programs or procedures to ensure continuous learning for all staff in the use of technology to improve productivity	4.06	AR	6
7. Encourage teachers to access online learning material to share with students in the classroom	4.27	AR	2
8. Interact through various digital technologies and identify appropriate digital communication tools in context	3.98	AR	8
9. Use digital tools and technologies for collaboration	4.00	AR	7
10. Organize technology-competence training among teachers, students, and parents	3.71	AR	10
Average Mean	**4.01**	**AR**	

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BR – Beginning Readiness

Table 1.3 presents the digital era readiness of school heads in terms of professional productivity and practice. It shows how the school heads' mean for every indicator with verbal description and were ranked according to their responses.

The table reveals that to become digital era ready, school heads primarily use technology to communicate with students, parents and community members with a mean of 4.28 which falls under *approaching readiness* while organizing technology-competence training among teachers, students, and parents with a mean of 3.71 which still falls under *approaching readiness* ranked last. Furthermore, the second indicator under digital leadership has an average mean of 4.06 and can be verbally described as approaching readiness.

Results show that school heads are utilizing technology in transferring information to the school's clientele: the teachers, learners, parents, and other stakeholders. The Department of Education highly encourages transparency in the department by disseminating information from the Central Office down to the schools. As stated in Republic Act 9155, communication channels shall strengthen and facilitate flow of information and expand linkages with NGAs, LGUs and NGOs for effective governance. Schools make use of the Electronic School Report Card (ESRC) as a tool for advocating the school situation context and performance to internal and external stakeholders.

Furthermore, leaders in the digital environment not only interact virtually but have personal contact with their followers. Digital communication is essential not only for the internal construction of information and communication but also for interaction with external audience, in the Philippine Education setting, the stakeholders. School leaders need to have a well-established communication strategy for the digital generation and transmission of information, use of social networks and the Internet. It is important for the school heads to have a constant connection with the, to have a two-way connection so as the internal and external stakeholders are informed of current and future activities or any other information worth sharing by the school.

Sheinger (2014) backs up this finding, describing digital leadership as "giving direction, convincing individuals, initiating sustainable change through access to information, and creating relationships in order to foresee changes that will be crucial to future school performance." Leaders must learn to anticipate students' and employees' learning demands, as well as their desire for information from stakeholders. He emphasizes it even more as he outlines the seven pillars of digital leadership, with public relations focusing on how leaders can build a foundation of positive public relations associated with their schools and create a much-needed level of transparency, as well as how leaders can use social media tools to create a positive brand presence that emphasizes the positive aspects of school culture, increases community pride, and helps to attract/retain families when they are looking for a new school. However, further analysis reveals that when it comes to school leaders' preparation, organizing technology-competence trainings among teachers, students, and other stakeholders is still on par. Most research on technology and training in the second decade of the twenty-first century has focused primarily on teacher preparation in using technology in the classroom rather than school administrators' preparation, skills, knowledge, and related leadership, according to Shepherd and Taylor (2015), leaving a research gap concerting the skills and preparation of school administrators to become digital leaders. Furthermore, the International Society for Technology in Education (ISTE, 2018) reiterated this sentiment, adding that because administrators wield so much power within the school, their thoughts and opinions on technology integration are crucial. As a result, it is vital that administrators are appropriately educated to serve as digital instructional leaders and that they act in such a way that technology is integrated into every part of the school.

Table 1.4

Digital Leadership of School Heads in Terms of Support, Management and Operations

IV. Support, Management and Operations	Mean	VD	Rank
1. Monitor the implementation of policies and procedures ensuring the compatibility of technologies	3.90	AR	3
2. Implement and use integrated technology-based management and operations systems	3.78	AR	6
3. Advocate for financial and human resources to ensure the complete and sustained implementation of the school or district technology plan	3.70	AR	8.5
4. Integrate strategic plans, technology plans, and other improvement plans and policies to align effort and leverage resources	3.75	AR	7
5. Implement procedures to drive continuous improvements of technology systems and to support technology replacement cycles	3.70	AR	8.5
6. Employ a variety of strategies to recognize or reward staff who use technology in innovative ways	3.83	AR	4
7. Provide safe and healthy physical environments in which staff use technology	4.13	AR	1
8. Develop guidelines and staff development to facilitate sharing of work and resources across commonly used formats and platforms	3.97	AR	2
9. Use technology-based systems to manage and evaluate daily campus operations	3.69	AR	10
10. Seek out new ways that technology might be used to improve the efficiency of school or district operations or to extend the capabilities of the school or district /division organization	3.81	AR	5
Average Mean	**3.83**	**AR**	

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Table 1.4 summarizes the digital leadership of school heads in terms of support, management, and operations. It shows the school heads' mean for every indicator with verbal description and were ranked according to their responses.

The table reveals that to ensure the integration of technology to support productive systems for learning and administration, school heads primarily provide safe and healthy physical environments in which staff use technology with a mean of 4.13 which falls under *approaching readiness* while using technology-based systems to manage and evaluate daily campus operations with a mean of 3.71 which still falls under *approaching readiness* ranked last. Furthermore, the fourth component under digital leadership has an average mean of 3.83 and can be verbally described as *approaching readiness.*

The study's findings support DepEd's mission to protect and promote every Filipino's right to a quality, equitable, culture-based, and comprehensive basic education in which students learn in a child-friendly, gender-sensitive, safe, and motivating environment, teachers facilitate learning and constantly nurture every learner, and administrators and staff provide an enabling and supportive environment for effective learning.

DepEd Order No. 78, s. 2010 or the Guidelines on the Implementation of the DepEd Computerization Program (DCP) ensures the compliance of schools in terms of a healthy and safe physical environments in which both the teachers, students, and school heads on the use of technology. However, further analysis on the use of technology-based systems to manage and evaluate daily campus operations which ranked least among the 10 indicators can be attributed to the fact that DepEd has come up with various technology-based systems to help in the daily management of schools. These are Learners' Information System (LIS), Basic Education Information System (BEIS), Learning Resources Management and Development System (LRMDS), Enterprise Human Resource Information System (EHRIS), Program Management Information System (PMIS), DepEd Partnership Database System (DPDS) and the Learning Management System (LMS). Several electronic versions were also introduced such as the use of Enhanced School-Based Management (E-SBM) Assessment Tool, Electronic School Report Card (ESRC), and Electronic Self-Assessment Tool (E-SAT) among others. Recently, Educational Technology Unit (ETU) was created under the framework Office of the Undersecretary of Administration's Public Schools of the Future, the Digital Rise Program of the Department of Education which aims to promote and solidify the innovation and digitization project that will support the needed requirements of the K-12 Curriculum.

Table 1.5
Digital Leadership of School Heads in terms of Assessment and Evaluation

V. Assessment and Evaluation	Mean	VD	Rank
1. Evaluate how effectively technology is used for professional tasks	3.89	AR	5
2. Use technology to communicate findings from schools or district data analyses to improve campus administrative procedures	4.05	AR	2
3. Use a variety of methods to evaluate staff knowledge, skill and performance using technology	3.87	AR	6
4. Use technology to collect and analyze a variety of school or district data	4.12	AR	1
5. Use technology-based systems to manage and evaluate student information	3.95	AR	3
6. Evaluate how effective technology is used to support student learning	3.81	AR	8
7. Use technology to evaluate administrative and operational systems	3.81	AR	7
8. Use learning analytics to predict students' future performance	3.44	AR	10
9. Use learning analytics to maintain teachers and learners' continuous improvement	3.56	AR	9
10. Use technology to communicate information in a variety of formats on student learning and achievement to colleagues, parents, teachers, district/ division office personnel	3.91	AR	4
Average Mean	**3.84**	**AR**	

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BR – Beginning Readiness

Table 1.5 summarizes the digital leadership of school heads in terms of assessment and evaluation. It shows how the school heads' mean for every indicator with verbal description and were ranked according to their responses.

The table reveals that to ensure the use of technology to plan and implement comprehensive systems of effective assessment and evaluation, school heads primarily use technology to collect and analyze a variety of school or district data with a mean of 4.12 which falls under *approaching readiness* while the use learning analytics to predict students' future performance with a mean of 3.71 which still falls under *approaching readiness* ranked last. Furthermore, the fifth component under digital leadership has an average mean of 3.84 and can be verbally described as *approaching readiness.*

Several reports per day containing school data is being collected within the school or district going to the Schools Division Office, Regional Office and Central Office. These are collected, consolidated, and analyzed for different purposes. According to Ciolacu et. al. (2017), one of the essential elements of Education 4.0, is the use of learning analytics to forecast students' future performance and maintain continual progress. In this light, school administrators' capacity to comprehend educational data can be considered as a skill that will help schools move to Education 4.0. The responses of the school heads in the Schools Division of Marinduque contradict Richardson et.al. (2012) which found that educators lacked technical capabilities. The researchers discovered that without fundamental data analysis skills, principals cannot advise teachers on how to use data effectively. The researchers found that demonstrating the utility of the data is critical to gaining teachers' support and cooperation in the implementation of technology. In addition, they found that principals need training in the principles of applied research, strategic planning and evaluation in order to use student and school data and they feel that more is needed in principal certification programs and professional growth plans to improve the skills necessary for proper data-based leadership.

Table 1.6
Digital Leadership of School Heads in terms of Social, Legal and Ethical Issues

VI. Social, Legal and Ethical Issues	Mean	VD	Rank
1. Monitor and ensure that staff and students do not violate software licensing agreements	3.73	AR	9
2. Ensure that all staff understand and adhere to copyright laws	4.02	AR	5
3. Ensure that students understand and adhere to copyright laws	3.78	AR	8
4. Establish procedures for staff to ensure privacy, security and online safety related to the use of technology	3.82	AR	7
5. Establish procedures for students to ensure privacy, security, and online safety related to the use of technology	3.65	AR	10
6. Follow the rules and norms of behavior in the process of using digital technologies and communication in digital environments	4.03	AR	4
7. Follow digital ethics	4.16	AR	1
8. Select technology resources that respect learners' diversity	4.06	AR	3
9. Promote the responsible use of technology, respect for Indigenous People (IP)) and fair use	4.07	AR	2
10. Facilitate the teachers and learners use of technology that addresses their social needs and cultural identity and promotes their interaction with the global community	3.95	AR	6
Average Mean	**3.93**	**AR**	

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Table 1.6 summarizes the digital leadership of school heads in terms of social, legal, and ethical issues. It shows the school heads' mean for every indicator with verbal description and were ranked according to their responses.

The table discloses that for school heads to understand the social, legal and ethical issues related to technology and responsible decision making related to these issues, they basically follow digital ethics with a mean of 4.16 which falls under *approaching readiness* while the establishing procedures for students to ensure privacy, security, and online safety related to the use of technology with a mean of 3.71 which still falls under *approaching readiness* ranked last. Furthermore, the sixth component under digital leadership has an average mean of 3.93 and can be verbally described as *approaching readiness*. This shows how these school heads project integrity and professionalism in their practice. Technology brings ethical issues to the forefront and from an ethical standpoint, digitization of society pushes the boundaries of our abilities and offers all sorts of opportunities, but also challenges our moral boundaries. The fact is to be told that social and ethical issues arise when society becomes digitized.

However, a closer examination of the data reveals that the school heads of the Schools Division of Marinduque are excellent school leaders, serving as role models for professionalism, ethical, and moral leadership. They also project integrity by promoting and supporting an environment in which teachers, non-teaching staff, and students do "what is right." They are aware of the social, ethical, legal, and human issues surrounding the use of technology in schools and assist teachers in putting that knowledge into practice. Furthermore, they advocate for the creation of methodologies and professional development for addressing social, ethical, and legal concerns, as well as responsible technology use, at the school/classroom level.

The study conducted by Weng and Tang (2014) supported the findings, stating that Education 4.0 school managers are expected to have knowledge and proficiency in digital ethics, digital citizenship, and digital security challenges.

Table 1.7
Digital Skills of School Heads

Digital Skills	Mean	VD	Rank
1. Evaluate and choose suitable connection method to access the Internet	3.96	AR	10
1. Evaluate, choose, and use appropriate search engines	3.73	AR	23
2. Evaluate online information for relevance, bias, validity, reliability, and sufficiency	3.76	AR	21
3. Publish materials in the web using any publishing tools	3.12	DR	25
4. Use e-mail account for exchanging information with colleagues, teachers, learners, parents, and other stakeholders	4.25	AR	2
5. Download and save data (images, files, softwares, etc)	4.46	AR	1
6. Can purchase materials online	3.97	AR	7.5
7. Recognize ownership of digital information and guard against digital theft and plagiarism	3.86	AR	14
8. Can enhance the level of security settings to protect personal information online	3.81	AR	17
9. Use appropriate tools and utilities to protect the computer from viruses	3.91	AR	12
10. Edit documents using collaboration software	3.79	AR	20
11. Participate in a discussion forum in the internet	4.12	AR	5
12. Participate in social networking	3.83	AR	15
13. Download and install software in a computer	3.79	AR	18.5
14. Download and upload curriculum resources from/to websites or learning platforms for students' use	3.96	AR	9
15. Proficient in using different online data system (EBEIS, LIS, EHRIS, LRMDS, DPDS)	3.97	AR	7.5
16. Know how to use the internet to efficiently find credible information and resources	4.23	AR	3
17. Know how to evaluate quality digital instructional curricula	3.74	AR	22
18. Know how to successfully facilitate online discussion/orientation/training/ learning development activities	3.82	AR	16
19. Can take / attend online courses	4.08	AR	6
20. Know how to use online communication platforms	4.17	AR	4
21. Know how to use digital collaboration tools (ex. Google Docs, Google Slides, Google Sheets, Google Forms etc.)	3.95	AR	11
22. Know how to store/ retrieve data and information using online storage	3.79	AR	18.5
23. Make and use digital presentations	3.86	AR	13
25. Effectively use Software Productivity Tools	3.48	AR	24
Average Mean	3.90	AR	

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Legend: R – Ready
DR – Developing Readiness
NR – Not Ready
AR – Approaching Readiness
BR – Beginning Readiness

Table 1.7 summarizes the digital era readiness of school heads in terms of digital skills It shows the school heads' mean for every indicator with verbal description and were ranked according to their responses.

The table discloses that among the listed 25 digital skills, downloading and saving data (images, files, software, etc.) with a mean of 4.46 ranks first which falls under *approaching readiness* while publishing materials in the web using any publishing tools with a mean of 3.12 which falls under *developing readiness* ranked last. Furthermore, the digital skills of the school heads have an average mean of 3.90 and can be verbally described as *approaching readiness*. This only means that school heads of the Schools Division of Marinduque are equipped with skills and are well-versed that they can effectively model and support technology initiatives in their respective schools.

The findings of the study contradict those of Nwagwu (2018), who found that only a few school heads had gained much knowledge and skills related to ICT usage and purposes, while many school heads were having significant difficulties and problems implementing ICT for school administrative purposes. This research also covers a research need identified by McLeod, Richardson, and Sauers (2015) in their study of administrators' readiness to lead in a digital learning environment.

Table 1.8
Summary of Digital Era Readiness of School Heads According to Digital Leadership and Digital Skills

A. Digital Leadership	Mean	Verbal Description	Rank
1. Leadership and Vision	4.01	Approaching Readiness	2
2. Teaching and Learning	3.94	Approaching Readiness	3
3. Productivity and Professional Practice	4.06	Approaching Readiness	1
4. Support, Management and Operations	3.83	Approaching Readiness	6
5. Assessment and Evaluation	3.84	Approaching Readiness	5
6. Social, Legal and Ethical Issues	3.93	Approaching Readiness	4
A. Digital Leadership	3.94	Approaching Readiness	
B. Digital Skills	3.90	Approaching Readiness	
C. Digital Era Readiness	3.92	Approaching Readiness	

Table 1.8 exhibits the summary of digital era readiness of school heads in terms of digital leadership subdivided into 6 indicators and digital skills. It shows the school heads' mean for every indicator with verbal description and were ranked accordingly.

The table discloses that among 6 indicators for digital leadership, productivity, and professional practice with a mean of 4.06 ranks first which falls under *approaching readiness* while Support, Management and Operations with a mean of 3.83 which still falls under *approaching readiness* ranked last. Furthermore, the combined mean for digital leadership of 3.94 compared with the average mean for digital skills of the school heads of 3.90 with a combined average of 3.92 for digital era readiness and can be verbally described as *approaching readiness*. This only means that school heads of the Schools Division of Marinduque have higher digital leadership execution when compared with the result of their digital skills.

Further analysis of the result shows that school heads carry out their digital leadership more than exercising their digital skills. The most crucial aspect of school is leadership. School leaders should take seriously the emergence of the Industrial Revolution 4.0 age in global leadership. Given the significance of IR 4.0, it is only fitting that school leaders include digital technology into their leadership practices. Technology plays a much larger role in the digital era than it did for previous generations has made today. Digital leadership execution and digital skills coupled with recent technological advances has led to the expansion of technology in education. Without a doubt, technology will be a crucial part of the education in the digital era.

The findings of the study back up what Speedy and Brown (2014) said about the function of digital leadership in school management, stating that it is thought that digital leadership plays a critical role in assisting school leaders in their leadership and management roles.

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The study further manifests the study of Kadiyono et al. (2020) where they stated that that to become a professional school leader, it requires personality, management, entrepreneurship, supervision, and social skills. The ability to face the era of Industry Revolution 4.0 is demonstrated by the ability of managers to deal with technology and entrepreneurial skills. School leaders' efforts to improve their skills consist of further education, participation in various training courses, seminars, workshops, and various support activities. Collaboration from different parties especially policy makers is needed to enable school leaders become professional and quality leaders.

Part II. School Heads' Leadership and Management Competencies (Philippine Professional Standards for School Heads – PPSSH)

Table 2.1
School Heads Proficiency in Leading Strategically (Domain 1)of Philippine Professional Standards for Schools Heads (PPSSH)

Strands	Mean	Verbal Description	Rank
1.1 Vision, mission and core values	3.96	More Proficient	3
1.2 School Planning and implementation	4.04	More Proficient	1
1.3 Policy implementation and review	3.96	More Proficient	3
1.4 Research and innovation	3.29	Moderately Proficient	7
1.5 Program design and implementation	3.69	More Proficient	6
1.6 Learners' voice	3.96	More Proficient	3
1.7 Monitoring and evaluation processes and tools	3.88	More Proficient	5
Average Mean	3.83	More Proficient	

Table 2.1 exhibits the proficiency of school heads in the Schools Division of Marinduque in 7 strands under Domain 1 of Philippine Professional Standards for School Heads (PPSSH). It shows the school heads' mean for each strand with verbal description and were ranked accordingly.

The table discloses that among 7 strands under the first domain, school planning and implementation with a mean of 4.04 ranks first which can be described as *more proficient* while research and innovation with a mean of 3.29 which falls under *moderately proficient* category ranked last. The table further reveals the average mean of 3.83 for Domain 1 which is *more proficient.*

This simply implies that school heads in the Schools Division of Marinduque have committed to a strategic course of action in line with institutional goals in order to maximize organization performance. They also demonstrated a thorough awareness of the current state of the school and were able to identify and analyze key sources of information.

The school leadership competencies were evaluated moderately proficient, indicating that the school heads demonstrated expertise in directing the school. The school leaders effectively guided the school through the planning stages of various programs, projects, and activities (PAPs) until they were implemented in accordance with institutional goals and policies. Their approach to school leadership has clearly resulted in them sharing their best practices with other principals and including the entire school community in the development and implementation of school plans.

Significant findings, however, show that school leaders only perform well in terms of research and innovation. This has implications for the promotion of a research culture in the Schools Division of Marinduque in order to facilitate data-driven and evidence-based innovations that improve school performance and foster continuous improvement.

The findings of the study support Kin and Kareen's (2019) assertion that school leadership quality is one of the most important drivers of student outcomes, and that effective school administration is strongly reliant on school leaders' professional competencies.

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Table 2.2
School Heads Proficiency in Managing School Operations and Resources (Domain 2) of the Philippine Professional Standards for School Heads (PPSSH)

Strands	Mean	Verbal Description	Rank
2.1 Records management	4.11	More Proficient	4
2.2 Financial management	4.25	More Proficient	1
2.3 School facilities and equipment	4.12	More Proficient	3
2.4 Management of staff	4.21	More Proficient	2
2.5 School safety for disaster preparedness, mitigation and resiliency	4.08	More Proficient	5
2.6 Emerging opportunities and challenges	3.99	More Proficient	6
Average Mean	4.13	More Proficient	

Table 2.2 presents the proficiency of school heads in the Schools Division of Marinduque in seven strands under Domain 2 of Philippine Professional Standards for School Heads (PPSSH). It shows the school heads' mean for each strand with verbal description and were ranked accordingly.

The table discloses that among six strands under the second domain, financial management with a mean of 4.25 ranks first which can be described as *more proficient* while emerging opportunities and challenges with a mean of 3.99 which still falls under *more proficient* category ranked last. The table further reveals the average mean of 4.13 for domain 2 which is *more proficient.*

This simply means that the heads of schools in Marinduque's Schools Division have confirmed their commitment to maintaining efficiency, effectiveness, and justice in the discharge of functions in order to maximize the organization's operations and resources. It also means they are familiar with and follow laws, policies, guidelines, and issuances pertaining to the management of human, financial, and material resources, as well as promoting a culture of transparency and accountability in schools to ensure the continued delivery of basic education services.

This further means that their ability to manage school operations is the result of a comprehensive process of adopting best practices that are consistent with the regulations against common malpractices. Their knowledge and understanding of rules, guidelines, and issuances in managing funds such as allocation, procurement, distribution, and liquidation reveals their efficient and effective administration of finances linked to the school plan.

However, their ability to respond to the requirements of students, teachers, and other stakeholders in terms of establishing opportunities and challenges to promote equality and fairness in addressing the needs of students, teachers, and other stakeholders has to be improved.

Thus, the constant correct and prescribed practices will impact to better performance of the school through the improving capacities of school heads such as in using appropriate technology in the management and operations, developing a school budget which is consistent with School Improvement Plan (SIP) and Annual Implementation Plan (AIP), managing the implementation, monitoring and review of the School Improvement Plan (SIP) and Annual Implementation Plan (AIP) and other action plans, taking the lead in the design of a school physical plant and facilities improvement plan in consultation with an expert/s and institutionalizing best practices in managing and monitoring school operations.

The result of the study conforms with the study conducted by Valenzuela and Buenvenida (2021) on managing school operations and resources in the Schools Division of Laguna where the school heads are very knowledgeable and skillful in financial management in terms of knowledge and adherence to the guidelines, policies, and issuances, ensuring that the fund allocation and procurement are aligned with the school plan which is a requirement to ensure efficient and effective school operation.

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Table 2.3
School Heads Proficiency in Focusing on Teaching and Learning (Domain 3) of Philippine Professional Standards for School Heads (PPSSH)

Strands	Mean	Verbal Description	Rank
3.1 School-based review, contextualization, and implementation of learning standards	4.01	More Proficient	8
3.2 Teaching standards and pedagogies	4.05	More Proficient	5
3.3 Teacher performance feedback	4.08	More Proficient	4
3.4 Learner achievement and other performance indicators	4.04	More Proficient	7
3.5 Learning assessment	4.09	More Proficient	3
3.6 Learning environment	4.13	More Proficient	1.5
3.7 Career awareness and opportunities	4.05	More Proficient	6
3.8 Learner discipline	4.13	More Proficient	1.5
Average Mean	4.07	More Proficient	

Table 2.3 presents the proficiency of school heads in the Schools Division of Marinduque in eight strands under Domain 3 of Philippine Professional Standards for School Heads (PPSSH). It shows the school heads' mean for each strand with verbal description and were ranked accordingly.

The table discloses that among eight strands under the third domain, learning environment and learning discipline with a mean of 4.13 both ranked first which can be described as *more proficient* while school-based review, contextualization and implementation of learning standards with a mean of 4.01 which still falls under *more proficient* category ranked last. The table further reveals the average mean of 4.07 for domain 3 is *more proficient.*

This only means that school heads in the Schools Division of Marinduque reaffirms the work of school heads in promoting quality teaching and learning. This validates the school heads commitment in providing instructional leadership towards improving competence among teachers and outcomes among learners.

This implies that the school heads instructional leadership has something to do with the performance of the school as it urges the mandate of 70/30 instructional supervision and administration. School heads fulfilled their role of instructional leadership by providing instructional supervision and technical aid to instructors, which resulted in improved student performance. The provision of technical assistance on instruction relating to curricular practice and performance, as well as the construction of a learner-centered environment that enables access to inclusive, quality, relevant, and liberating education, are both clearly demonstrated.

However, the results reveal that they are the least effective in reviewing, contextualizing, and implementing learning standards to help teachers make the material relevant for students.

The findings of the study are consistent with the study of Bantolo and Arenga (2021) on school heads' competencies and performance on schools, which found that school heads religiously performed well in meeting the needs of all types of learners in the school community by localizing and contextualizing content to make it more meaningful to the learners and applicable to real-life situations in the community.

Table 2.4
School Heads Proficiency in Developing Self and Others (Domain 4) of Philippine Professional Standards for School Heads

Strands	**Mean**	**Verbal Description**	**Rank**
4.1 Personal and professional development	4.23	More Proficient	1
4.2 Professional reflection and learning	4.17	More Proficient	2
4.3 Professional networks	4.02	More Proficient	8
4.4 Performance management	4.08	More Proficient	6
4.5 Professional development of school personnel	4.09	More Proficient	4.5
4.6 Leadership development in individuals and teams	4.09	More Proficient	4.5
4.7 General welfare and human resources	4.15	More Proficient	3
4.8 Rewards and recognition	4.04	More Proficient	7
Average Mean	**4.11**	**More Proficient**	

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Table 2.4 presents the proficiency of school heads in the Schools Division of Marinduque in eight strands under Domain 4 of Philippine Professional Standards for School Heads (PPSSH). It shows the school heads' mean for each strand with verbal description and were ranked accordingly.

The table discloses that among eight strands under the fourth domain, personal and professional development with a mean of 4.23 ranked first which can be described as *more proficient* while professional networks with a mean of 4.02 which also falls under *more proficient* category ranked last. The table further reveals the average mean of 4.11 for domain 4 is *more proficient.*

This simply means that school leaders in the School Division of Marinduque realize their responsibility in developing themselves and others, and they reaffirm their commitment to guaranteeing the effectiveness of people and teams.

This also implies the school leaders' responsibility as technology leaders, which involves involving teachers in technology-focused professional development and technology integration in student learning activities. Similarly, allowing teachers and staff to participate in professional development that highlights the use of technology and supports its integration into student learning is a good idea.

Furthermore, it is thought that a good leader's first concern is the school system; as a result, in the era of Education 4.0, school leaders must be nimble and adapt their leadership practice to suit the expectations of learners, stakeholders, and the school system. School leaders can only become effective leaders if they can acquire new information, skills, and talents through systematic and ongoing professional development programs or interventions, especially when the demand for educational excellence grows.

Moreover, DepEd recognizes the importance of professional standards in the continuing professional development and advancement of school heads based on the principles of career-long learning using DepEd Order No. 24 s. 2020 or the Philippine Professional Standards for School Heads (PPSSH). DepEd upholds that quality student learning is contingent upon quality teachers, who are supported by quality school leaders. However, professional networks ranked least as the school heads still need to improve in joining in various community of educators around the world. These communities may exist online e.g. *LinkedIn* where they can have a vibrant and ever-changing group of connections within which school heads and teachers share and learn. These professional networks reflect their values, passion and areas of expertise.

Result of the study agrees with Lin (2016) which showed principals utilized hybrid ways to support the teachers' communication and collaboration including formal meetings, group collaboration, trainings, social media, website, online learning, digital teaching, personalized professional development, peers' modeling, digital management, digital data collection and interpretation, digital citizenship promotion, and website filter.

Table 2.5
School Heads Proficiency in Building Connections (Domain 5)of Philippine Professional Standards for School Heads

Strands	Mean	Verbal Description	Rank
5.1 Management of diverse relationships	4.03	More Proficient	4
5.2 Management of school organizations	4.16	More Proficient	1.5
5.3 Inclusive practice	3.93	More Proficient	5
5.4 Communication	4.16	More Proficient	1.5
5.5. Community engagement	4.13	More Proficient	3
Average Mean	4.08	More Proficient	

Table 2.5 exhibits the proficiency of school heads in the Schools Division of Marinduque in five strands under Domain 5 of Philippine Professional Standards for School Heads (PPSSH). It shows the school heads' mean for each strand with verbal description and were ranked accordingly. The table discloses that among the five strands under the fifth domain, management of school organizations and communication with a mean of 4.16 both ranked first which can be described as *more proficient* while inclusive practice with a mean of 3.93 which also falls under *more proficient* category ranked last. The table further reveals the average mean of 4.08 for domain 5 is *more proficient.* This simply means that school leaders in the Schools Division of Marinduque have demonstrated their ability to engage stakeholders in programs aimed at improving school communities. This emphasizes their commitment to advocate for education as a shared obligation. Inculcating a deeper grasp of their vision, mission, and core values in developing connections with internal and external stakeholders, as shown in the table, school leaders demonstrate their duty and accountability. They also have abilities in relating to, dealing with, and forming relationships with others, and have been able to establish partnerships with individuals and organizations based on mutual trust, honesty and openness, respect, and a shared vision for achieving institutional goals.

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They also demonstrate their ability to communicate with teachers, learners, parents, and stakeholders using communication platforms to facilitate information sharing, collaboration, and support, as well as their knowledge and understanding of policies and guidelines in managing school organizations such as learner organizations, faculty clubs, and parent-teacher associations. However, they still need to increase their show of knowledge and comprehension of inclusive practices including gender sensitivity, physical and mental health awareness, and culture responsiveness, which will encourage awareness, acceptance, and self-respect.

Table 2.6
Summary of School Heads Proficiency in 5 Domains of Philippine Professional Standards for School Heads(PPSSH)

A. School Heads' Leadership and Management Competency Domains	Mean	Verbal Description	Rank
Domain 1: Leading Strategically	3.83	More Proficient	5
Domain 2: Managing School Operations and Resources	4.13	More Proficient	1
Domain 3: Focusing on Teaching and Learning	4.07	More Proficient	4
Domain 4: Developing Self and Others	4.11	More Proficient	2
Domain 5: Building Connections	4.08	More Proficient	3
Average Mean	4.04	More Proficient	

Table 2.6 summarizes the proficiency level of school heads in the Schools Division of Marinduque in the five domains of Philippine Professional Standards for School Heads (PPSSH). It shows the school heads' mean for each domain with verbal description and were ranked accordingly.

The table articulates that among the five domains of PPSH, managing school operations and resources with a mean of 4.13 ranked first which can be described as *more proficient* while leading strategically with a mean of 3.83 which also falls under more *proficient* category ranked last. The table further reveals the average mean of 4.05 which is *more proficient.*

This simply means that School Division of Marinduque's school leaders have established a culture of transparency and accountability in the continuous delivery of basic education services, as well as an understanding of and adherence to human, financial, and material resource management laws, policies, guidelines, and issuances. However, there is still room for improvement in terms of demonstrating a thorough understanding of the current state of the schools and implementing various collaborative strategies with internal and external stakeholders in order to respond appropriately to the schools' dynamic and rapidly changing needs. As a result, the preceding professional standards are a public declaration of school leaders' commitment to professional accountability, which will aid them in reflecting on and evaluating their own actions.

Table 3.1
Correlation Between Digital Era Readiness and School Leadership and Management Competencies

Digital Era Readiness					
Indicator	Spearman Rho Coefficient	Description	P value	Decision	Remarks
School Leadership Management and Competencies (PPSSH)	.558	Strong Positive Correlation	.000	Reject the Null Hypothesis	Significant

Table 3.1 presents the correlation between the school heads' digital era readiness and their leadership and management competencies as stated in the Philippine Professional Standards for School Heads (PPSSH). Result of the study reveals a strong positive correlation between the two variables with a computed p-value of .000 and Spearman-Rho coefficient of .558 rejecting the null hypothesis thus having a significant relationship or correlation between the two factors.

Furthermore, the findings of the study affirm those of Duncan (2011), who found that there is a knowledge gap between what principals should know and the skills they require. The dearth of technology courses in administration preparation, as well as few technology in-service courses expressly for administrators, was discovered to be the source of the skills and knowledge gap. Administrators also placed a high value on technological knowledge and skills to accomplish professional tasks, according to the findings.

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IV. SUMMARY OF FINDINGS

1) In describing the school heads' digital era readiness in terms of the following:

a) Digital Leadership in terms of:

- Leadership and Vision, school heads are under *approaching readiness*;
- Teaching and Learning, school heads are under *approaching readiness;*
- Professional Productivity and Practice, school heads are under *approaching readiness*;
- Support, Management and Operations, school heads are under *approaching readiness*;
- Assessment and Evaluation, school heads are under *approaching readiness;* and
- Social, Legal and Ethical Issues, school heads are under *approaching readiness*.

b) Digital skills, school heads are also under *approaching readiness.* Generally, school heads are *approaching readiness* in terms of the six indicators under digital leadership and in terms of digital skills.

2) In describing the school heads' leadership and management competencies in the five domains as stated in the Philippine Professional Standards for School Heads(PPSSH), the following findings are summarized as follows:

a) Leading strategically, school heads are *more proficient;*

b) Managing school operations and resources, school heads are *more proficient;*

c) Focusing on teaching and learning, school heads are *more proficient;*

d) Developing self and others, school heads are *more proficient; and*

e) Building connections, school heads are *more proficient.*

3) There is a significant relationship between the school heads' leadership and management competencies as indicated in the Philippine Professional Standards for School Heads (PPSSH) and their digital era readiness.

V. CONCLUSIONS

In the light of the foregoing findings of the study, the researcher concluded that:

1) School heads in the Schools Division of Marinduque are in the *approaching readiness* level when it comes to the digital era of Education 4.0 as manifested both by their digital leadership and digital skills.

2) School heads exhibit *more proficiency* in the execution of their leadership and management competencies in five domains as expected in the Philippine Professional Standards for School Heads (PPSSH).

VI. RECOMMENDATIONS

With continuous influence on education, technology is part of today's learning. School heads should not ignore technology. The role of the school head in this digital era towards Education 4.0 has changed from solely a school administrator to the multi-faceted role of curricular and technological leaders and maneuver their schools in improving technological literacy, teaching effectiveness, students' academic achievement and the over-all school leadership and management, therefore, in the light of the findings and the conclusion, the following recommendations may be recommended.

A. For the Department of Education officials

1) In view of the results that school heads are still on the process of getting themselves ready in the Digital Era of Education 4.0, it is suggested that school heads preparation includes the use of digital technology not just to enhance their educational leadership content delivery but to transform the content itself.

2) In as much as technology evolves at an ever increasing pace and everyone rely more and more on digital access to data, information, curriculum and each other, technology leadership is important and educational leadership preparation programs must continue to seek ways to better serve the next generation of leaders.

3) In consideration of strengthening leadership and management preparation and competencies of school heads in the Digital Era, it is recommended for school heads to keep up with the rapidly evolving advances in information technology and determine the significance of the latest digital tools in performing their duties and functions.

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4) In view of the results of the school heads readiness in terms of digital leadership:

- Provide a direction on a more multi-faceted technology plan while providing additional resources thereby creating a proactive technology plan with a proactive vision crucial for lasting and effective technology integration. (Leadership and Vision)
- School leaders and technology leaders focus on the same collaborative vision of sound technology integration across the curriculum through a critical assessment of how much technology students have access and how often they access it and if they have the resources to access it. (Teaching and Learning)
- More trainings that will capacitate the school leaders and future school administrators may be conducted not only on the use of digital tools but also on how to better use digital technologies to improve course content to improve student achievement. (Productivity and Professional Practice)
- School leaders at all levels may look into their respective jurisdiction to identify the gaps in their technology needs and reflect on the current realities on how to improve school operations through the effective use of technology resources. (Support, Management and Operations)
- School leaders may device a plan on how to use technology directly to collect and analyze data and other information that can improve decision making and other management functions. (Assessment and Evaluation)
- School leaders may access more meaningful opportunities on how to understand the legal and ethical issues related to technology licensing and usage and by becoming a personal and professional code of ethics related to digital culture such as ensuring equitable access to digital resources and responsible social media interaction. Social, Legal and Ethical Issues

5) Since digital leadership represents all activities about technology in school, including organizational decisions in terms of managing the schools, effective digital technology integration must be incorporated in the facilitation of all stages of instruction and school management.

6) The Department may continuously promote students' achievement by understanding and responding to the larger context through the establishment of policies for legal and safe use of digital information and technology.

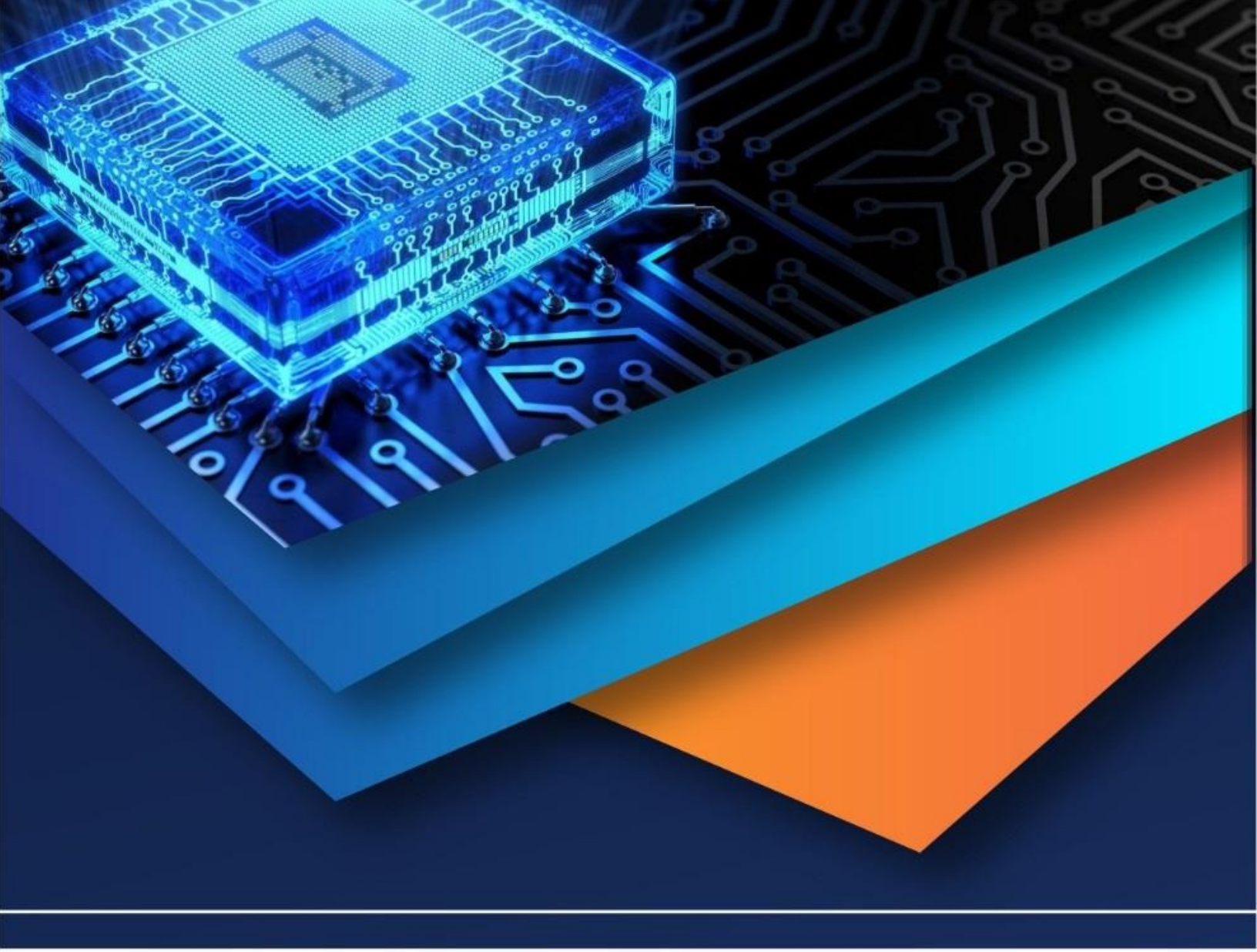
B. For the School Heads

1) Since results revealed that the school heads digital era readiness is still under the process of getting themselves ready in Education 4.0, it is strongly recommended that a comprehensive technology plan that would develop and articulate a shared vision for a comprehensive technology plan on how to advocate and sustain a digital age learning culture that provides instructional program conducive to the teaching and learning process including assessment of learners following social, legal and ethical standards, a long term staff professional development, collaboration with stakeholders and over-all improvement of the organization, operation, and resources for a safe and effective environment through the appropriate use of technology.

2) Taking into consideration on the results school heads proficiency in the 5 domains of the Philippine Professional Standards for School Heads (PPSSH), school heads may:

- Utilize the different research findings in facilitating data-driven and evidence-based innovations to improve school performance and promote a culture of research within their school or districts;
- Empower school personnel in managing emerging opportunities and challenges to ensure that quality and equity in addressing the needs of learners, school personnel and other stakeholders;
- Assist teachers and work with teams in the conduct of review, contextualization and implementation of learning standards in making the curriculum relevant to learners;
- Start participating and engage actively in professional networks within and across schools to maximize their potentials and enhance their practices; and
- Engage the wider school community to create a culture of inclusivity through practices of gender-sensitivity, physical and mental health awareness and culture responsiveness

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