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Digital Competencies and Self-Efficacy of Elementary School Heads in Leading Technology-Challenged School

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***Abstract*: This research investigates the digital competencies and self-efficacy of elementary school heads in Samar, Philippines, responding to the increasing demand for digital integration within educational frameworks. As information and communication technologies (ICT) continue to evolve rapidly and play an essential role in the education sector, this study aims to evaluate the existing levels of digital competencies and self-efficacy among school heads and examine how these skills correlate with their demographic characteristics. Utilizing a descriptive correlational research design, the study delves into the relationships between the demographic profiles, digital competencies, and self-efficacy of school heads across various districts within the Catbalogan City Division of Department of Education. The findings reveal a notable positive correlation between the profile of the school head-respondents and their digital competencies specifically in age. The result of the study is consistent with Laouni (2023) who studied about the school principals with similar findings that as the principals get older, they do not exhibit digital competence, particularly in utilizing modern educational technologies and online communication tools. Furthermore, a significant relationship is found in the level of digital self-efficacy and the number of years as school head. This could mean that experienced school heads in the Division of Catbalogan City do not give up using digital tools as they lead their respective stations. In addition, the school location of the school head-respondents displays a significant positive relationship with the dimension on self-regulation relative to digital self-efficacy. This suggests that school heads in certain geographic areas may benefit from more supportive environments that enhance their self-regulatory skills, which in turn boosts their confidence in using digital tools effectively. Moreover, the findings on the correlation between digital competency and digital self-efficacy (DSE) among the school head-respondents illustrate that respondents' digital competence in technical skills is not significant. Indicating that school head-respondents are not that confident in their technical skills relative to the use of digital tools or technology in their leadership, planning, and implementation in the educational setting. This investigation underscores the pressing need for customized professional development initiatives aimed at enhancing the digital capabilities of school administrators. By improving these skills, educational outcomes can be significantly elevated, fostering a more technology-enriched learning environment for students. The study advocates the implementation of a comprehensive, technology-focused training program designed to equip educational leaders with the essential skills required to navigate the challenges brought about by the digital transformation occurring in education today.**

***Keywords*: Digital competencies, self-efficacy, digital integration, school heads.**

1. Introduction

One of the most significant key elements at the turn of the 21st century is the necessity to embrace rapid change and cultivate in oneself the skill of comprehending and navigating the ever-evolving field of digitalization. As the pace of technological advancement continues to accelerate, the ability to continuously learn, adapt, perform tasks, solve problems, and manage information and communication technologies (ICT) and digital media has become increasingly crucial for individuals, organizations, and societies. In the context of an organization where there is a huge number of multipliers among learned individuals, it is fitting to mention that schools serve as prime institutions that vividly yield tangible results in adapting the objectives, processes, and implementation along with the great responsibility of employing "digitalized knowledge" (Pettersson, 2017). There is a clear understanding that it is not only students who should embrace digitalized knowledge, but also teachers and school heads or principals.

Essentially, the school community should develop and enhance digital competencies to attain quality education since the learning environments have been moved to utilize computers, the internet, projection, and interactive whiteboards (Apsorn et al., 2019). All mentioned ways to make the teaching-learning process easier and more effective would lead to lifelong learning. As has been reported by the European Council, digital competence is one of the skills for lifelong learning (European Union, 2018). Digital competence has been defined by Ferrari (2012) as: the set of knowledge, skills, attitudes, abilities, strategies, and awareness that are required when using ICT [information and communication technologies] and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly,

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ethically, reflectively for work, leisure, participation, learning and socializing'.

In the Philippines, there is undoubtedly an excessive effort to develop both digital competencies and efficacies in the educational system, particularly in the accessibility facet of those from rural areas (Tomaro & Mutiarin, 2018). Nevertheless, ICT integration must be continuously pursued in the teaching-learning activities among teachers and students as this is one of the government's goal in the country (Kubota et al., 2018,) and this enables the creation of rich teaching and learning environments (Caker & Yildirim, 2013) that will lead to an efficient delivery of the lesson and an effective quality education among students. Thus, school heads should lead the school community with digital competencies and efficacies to attain lifelong learning among the graduates of schools. While there is a recognized need for digital competencies and efficacies within the educational system in the Philippines, particularly in rural areas, there remains a significant research gap concerning the specific digital competencies and efficacies of elementary school heads in Samar. This gap is critical, as effective leadership in the digital age requires heads to not only possess these skills but also to effectively implement them in guiding their school communities. Without a clearer understanding of the current digital capabilities of these leaders, it is challenging to develop targeted intervention programs that can enhance their effectiveness and ultimately improve educational outcomes. Educational leadership and technology play a crucial role in shaping the future of education, particularly in regions like Samar. Implementing an intervention program in this context is essential for several reasons that would benefit the entire school system.

It can be understood that Samar faces significant challenges related to access to educational resources and technology. According to the Philippine Statistics Authority (2020), many schools in rural areas lack basic infrastructure, which hampers effective learning. An intervention program could provide resources and training that bridge these gaps, promoting equality in educational opportunities. Likewise, the integration of technology into the curriculum is essential for modern education. As noted by the International Society for Technology in Education (ISTE, 2017), educators must be equipped with the skills to incorporate digital tools into their teaching. An intervention program can facilitate this integration, making learning more engaging and relevant for students. School heads, on the other hand, must religiously attend to continuous professional development, which is crucial for educators and school leaders to keep pace with technological advancements. According to Darling-Hammond et al. (2017), ongoing training improves school leaders' and teachers' effectiveness in the classroom. An intervention program can provide targeted professional development opportunities, helping school heads and educators to remain current in their practices, ultimately honing the students with the skills necessary to combat challenges and compete with the academic world in the Industrial 4.0.

Henceforth, this study aimed to assess the digital competencies and self-efficacies of school heads despite some technological challenges in the discharge of their duties and responsibilities vis-à-vis the implementation of the Department of Education (DepEd) orders.

2. Methodology

A. Research Design

This study employed a quantitative method approach, specifically the descriptive correlational design, as defined by authors like McBurney and White (2009) and Salkind (2010). A descriptive correlational design is ideal for studying the relationships between two variables. This design enabled the researcher to analyze if there is a correlation between the demographic profile (age, gender, educational attainment, no. of years as school head, school location, and geographical location of s and the level of digital competencies of school heads; demographic profile and the level of self-efficacy of school heads; and the relationship between the level of digital competencies and self-efficacy of school heads. Researcher-made questionnaire was utilized to gather the data from the 50 elementary school heads (total population) of Catbalogan City Division of DepEd.

B. Research Instrumentation

This study employed a quantitative method approach, specifically the descriptive correlational design, as defined by authors like McBurney and White (2009) and Salkind (2010). A descriptive correlational design is ideal for studying the relationships between two variables. This design enabled the researcher to analyze if there is a correlation between the demographic profile (age, gender, educational attainment, no. of years as school head, school location, and geographical location of s and the level of digital competencies of school heads; demographic profile and the level of self-efficacy of school heads; and the relationship between the level of digital competencies and self-efficacy of school heads. Researcher-made questionnaire was utilized to gather the data from the 50 elementary school heads (total population) of Catbalogan City Division of DepEd.

C. Data Gathering

At the start of data collection, the researcher submitted a formal letter to the highest authority of the Catbalogan City Division, the Schools Division Superintendent, requesting permission to conduct data gathering among the elementary school heads. Once permission was granted, the approved communication letter was forwarded to the District Supervisor overseeing the elementary school heads. After being authorized, the researcher commenced the data gathering by personally asking consent to the fifty (50) school heads for the conduct of data gathering. The researcher explained to the respected elementary school heads the purpose of the study and its possible end goal. After the confirmation of the respondents' approval for their participation, the researcher informed the respondents of the confidentiality of their answers, and they were given a consent letter where their signatures were affixed. The respondents were asked whether they would answer the indicators by themselves or with assistance from the researcher.

Whatever the respondent's choice may be it would be respected. Much consideration is placed on respecting the respondents to earn their utmost trust (Mirza et al., 2023). They were assured that their responses would be disposed after the completion of the study. After the distribution of instruments to fifty (50) elementary school heads, only forty-five (45) were able to return the tool, and it gave the researcher the 90% retrieval rate.

3. Results and Discussion

This section provides a tabular presentation of the gathered and analyzed data which offers a comprehensive overview of the findings based on the objectives of the study. Data interpretation was presented to highlight key patterns and insights, facilitating a deeper understanding of the implications for educational leadership.

A. Age and Gender Distribution of the School Head-Respondents

Table 1

Age	Gender Category				Total	%
	Male		Female			
55 - 61	4	20.0	6	24.0	10	22.2
48 - 54	10	50.0	10	40.0	20	44.4
41 - 47	1	5.0	5	20.0	6	13.3
33 - 40	5	25.0	4	16.0	9	20.0
Total	**20**	**100.0**	**25**	**100.0**	**45**	**100.0**
Mean	**48.5**	-	**49.1**	-	**48.8**	-
SD	**7.8**	-	**6.7**	-	**7.1**	-
Percent	**44.4**	-	**55.6**	-	**100.0**	-

This information suggests the greater percentage of female respondents (55.6%) indicates a strong presence of women in leadership positions in schools. This is an indication that female school heads are contributing greatly to educational leadership and decision-making in the DepEd, Catbalogan City Division.

B. Educational Background of the School Head-Respondents

Table 2

Specialization	Highest Educational Attainment				Total	Percent
	Phd/EdD	with Phd/EdD Units	Master Degree	Master's Units		
Non - Educational Management	0	1	4	2	7	15.56
Educational Management	1	6	13	18	38	84.44
Total	**1**	**7**	**17**	**20**	**45**	**100.0**
Percentage	**2.2**	**15.6**	**37.8**	**44.4**	**100.0**	-

The findings presented in Table 2 emphasize the critical role of higher education in shaping the leadership abilities of school heads. Higher education equips these leaders with the knowledge, skills, and expertise necessary to address the dynamic challenges of managing educational institutions. In particular, the data underscores the importance of fostering scholarly growth, especially in specialized fields like Educational Management, which provide targeted insights into effective leadership practices. This focus not only reflects the current competencies of school heads but also sets a benchmark for the expectations placed on future leaders. Supporting academic advancement in such areas ensures a robust pipeline of well-prepared individuals capable of leading schools toward excellence and innovation in education.

C. Number of Years of the Respondents as School-Heads

Table 3

No. of Years as School Heads	Frequency	Percent
23 – 27	2	4.4
18 – 22	3	6.7
13 – 17	6	13.3
9 – 12	12	26.7
4 – 8	17	37.8
≤ 3	5	11.1
Total	**45**	**100.0**
Mean	**9.3**	-
SD	**5.9**	-

The results reveal patterns of leadership in Catbalogan City Division. The institutions in this area can develop leadership pipelines to enhance the presence of more experienced school heads as well as the development of younger leaders.

D. School Location of the School Head-Respondents

Table 4

School Location	Frequency	Percent
Central School	9	20%
Carline	10	22.22%
Upland	13	28.89%
Coastal	13	28.89%
Total	**45**	**100.00**

The findings demonstrate how geographic location shapes the culture of education leadership. Regional contexts, including social-economic conditions, cultural factors, and resource availability, lead school heads to different but unique predicaments in different areas. These dynamics highlight the necessity of region-specific, tailored, and flexible education policies and programs in support of leaders. By focusing on the unique needs of each geographical region, such initiatives may enable the heads of schools to tackle localized challenges while creating equal access to education of a good quality across regions. This not only elevates policymaking, emphasizing inclusion and responsiveness but also underscores the key role of leadership in driving educational outcomes in diverse contexts.

E. Geographical Location of the School Head-Respondents' Home Address

The data indicate a moderate presence of school leaders in urban settings, which may afford them different resources and challenges compared to their counterparts in rural or coastal areas. Conversely, the 15.6% residing in coastal areas and the minimal 4.4% in upland barangays highlight potential disparities in access to educational resources and support, as school heads in these locations may face unique challenges

related to their geographical context, such as limited infrastructure or support networks.

Table 5

Home Address Geo Location	Frequency	Percent
Central	9	20.0
Carline	27	60.0
Upland	2	4.4
Coastal	7	15.6
Total	**45**	**100.0**

F. Level of Digital Competency of the School Head-Respondents Along with Technical Skills

Table 6

Level of Digital Competency		Frequency	Percent
17 - 20	Highly Competent	34	75.6
13 - 16	Competent	0	0.0
9 - 12	Developing Competent	10	22.2
4 - 8	Not Competent	1	2.2
Total		**45**	**100.0**

The data illustrated in Table 6 indicates the levels of digital competency among school head-respondents regarding their technical skills. Out of a total of 45 respondents, a significant majority, 34 individuals (75.6%), are classified as "Highly Competent," indicating strong proficiency in digital skills. Additionally, 10 respondents (22.2%) fall into the "Developing Competent" category, suggesting they possess basic skills but require further enhancement. Only one (1) respondent (2.2%) is categorized as "Not Competent," highlighting a minimal presence of inadequate digital skills among the group. Overall, the data reflects a predominantly high level of digital competency among school heads, indicating their readiness to engage with technology effectively in their roles.

G. Level of Digital Competency of the School Head-Respondents Along Digital Leadership and Strategies

Table 7

Level of Digital Competency		Frequency	Percent
17 - 20	Highly Competent	39	86.7
13 - 16	Competent	0	0.0
9 - 12	Developing Competent	6	13.3
4 - 8	Not Competent		
Total		**45**	**100.0**

The positive result of this dimension in digital leadership and strategies could be encouraging teachers and students to live up to the expectations of the school head particularly in promoting and integrating technology into the educational process. The strong role of the school head in digital leadership creates a smooth workflow among teachers with some innovations in the use of technology to realize the vision, mission, and goal of the school (Nawaz et al., 2023). This leadership can foster a culture of innovation, where teachers feel supported in exploring new digital tools and methodologies. By effectively modeling digital competencies, school heads can inspire their staff to embrace technology, thereby enhancing teaching practices and student engagement

H. Level of Digital Competency of the School Head-Respondents Along with Instructional Technology

Table 8

Level of Digital Competency		Frequency	Percent
17 - 20	Highly Competent	29	64.45
13 - 16	Competent	0	0.0
9 - 12	Developing Competent	15	33.3
4 - 8	Not Competent	1	2.2
Total		**45**	**100.0**

These findings were genuinely significant in the discharge of the school heads' duties and responsibilities to effectively manage their schools, particularly in supporting and encouraging their teachers to utilize technology in the delivery of instructions. Gamao and Melchor (2024) proved that it is important to have school heads who are digitally competent in instructional technology for it correlates to the proficiency of teachers in utilizing digital tools.

I. Level of Digital Competency of the School Head-Digital Along with Communication and Collaboration

Table 9

Level of Digital Competency		Frequency	Percent
17 - 20	Highly Competent	40	88.9
13 - 16	Competent	0	0.0
9 - 12	Developing Competent	5	11.1
4 - 8	Not Competent	0	0.0
Total		**45**	**100.0**

The result proves that elementary school heads in the Division of Catbalogan City are competent enough to communicate and collaborate using digital tools. These must be the qualities that school heads must possess as what has been confirmed by Rasdiana et al. (2024) that the core of technology leadership of principals is the ability to effectively use digital tools in communication to stakeholders - internal and external.

J. Level of Digital Competency of the School Head-Digital Along with Problem Solving and Innovation

Table 10

Level of Digital Competency		Frequency	Percent
17 - 20	Highly Competent	30	66.7
13 - 16	Competent	0	0.0
9 - 12	Developing Competent	14	31.1
4 - 8	Not Competent	1	2.2
Total		**45**	**100.0**

Targeted professional development programs could be beneficial in addressing the needs of the "Developing Competent" group of school head-respondents, equipping them

with the necessary tools and strategies to enhance their problem-solving abilities. Though there is an existence of difficulty and low-level training in the use of technology (Basilotta et al., 2022), it is crucial to implement comprehensive training that focuses not only on technical skills but also on fostering a mindset of innovation and adaptability. By investing in the continuous improvement of digital competencies, school leaders can foster a culture of innovation within their school, ultimately leading to more effective educational practices and better outcomes for students.

K. Level of Digital Competency of the School Head-Digital Along with Ethical and Legal Use of Technology

Table 11

Level of Digital Competency		Frequency	Percent
17 - 20	Highly Competent	21	46.7
13 - 16	Competent	15	33.3
9 - 12	Developing Competent	8	17.8
4 - 8	Not Competent	1	2.2
Total		**45**	**100.0**

The findings would show that school heads do know how to use technology ethically and legally. They knew the boundaries of technology use particularly the other negative consequences (Song, 2021) like using the AI and other sources online. This understanding is vital in fostering a responsible digital environment within their schools. By demonstrating ethical technology use, school leaders set a positive example for teachers and students alike, promoting a culture of integrity in digital engagement.

L. Level of Digital Self-Efficacy of the School Head-Respondents Along with Confidence in Using Technology

Table 12

Level of Digital Self-Efficacy		Frequency	Percent
17 - 20	Strongly Confident	21	46.7
13 - 16	Confident	19	42.2
9 - 12	Somewhat Confident	5	11.1
4 - 8	Not Confident	0	0.0
Total		**45**	**100.0**

The data indicates a predominantly positive outlook on digital self-efficacy among school heads, with the majority expressing strong or confident feelings about their technological capabilities. This strong confidence in digital self-efficacy tends to enable the school heads to explore more on digital platforms such as but not limited to Facebook applications, AI apps, and software apps like Microsoft Offices. This has been confirmed and conversely discussed in the study of Berkowsky and van Deursen (2016) that the absence of digital self-efficacy would lead to blocking digital skills. Hence, it is becoming essential that school leaders should enhance their knowledge and interest in the use of digital tools. This can further be explained in the context of the personal willingness of individuals to complete their tasks, especially when facing challenges along digitalization (Rosales et al., 2024).

M. Level of Digital Self-Efficacy of the School Head-Respondents Along with Ability to Lead Digital Integrations

Table 13

Level of Digital Self-Efficacy		Frequency	Percent
17 - 20	Strongly Confident	3	6.7
13 - 16	Confident	25	55.6
9 - 12	Somewhat Confident	13	28.9
4 - 8	Not Confident	4	8.9
Total		**45**	**100.0**

The relationship between school heads' confidence and their ability to lead digital initiatives is complex. A lack of confidence among school leaders can create a trickle-down effect, potentially leading to lower motivation and engagement among teachers regarding technology use. Conversely, when school heads actively promote a culture of digital integration and provide support for their staff, it can enhance the overall confidence and competence of the teaching team, ultimately benefiting student learning outcomes.

N. Level of Digital Self-Efficacy of the School Head-Respondents Along with Self-Regulation and Adaptability

Table 14

Level of Digital Self-Efficacy		Frequency	Percent
17 - 20	Strongly Confident	19	42.2
13 - 16	Confident	19	42.2
9 - 12	Somewhat Confident	7	15.6
4 - 8	Not Confident	0	0.0
Total		**45**	**100.0**

The findings reveal that school heads in Catbalogan City Division are not only aware of their digital skills but also exhibit a robust belief in their ability to self-regulate and adapt to new technologies, which aligns closely with Bandura's Self-Efficacy Theory (1977). According to Bandura, self-efficacy refers to an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments. The substantial proportion of respondents categorized as "Strongly Confident" and "Confident" underscores a strong sense of self-efficacy, indicating that these school heads believe they can effectively manage their digital competencies and navigate the challenges posed by emerging technologies.

O. Level of Digital Self-Efficacy of the School Head-Respondents Along with Confidence in Using Technology

Table 15

Level of Digital Self-Efficacy		Frequency	Percent
17 - 20	Strongly Confident	21	46.7
13 - 16	Confident	19	42.2
9 - 12	Somewhat Confident	5	11.1
4 - 8	Not Confident	0	0.0
Total		**45**	**100.0**

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technological capabilities. This strong confidence in digital self-efficacy tends to enable the school heads to explore more on digital platforms such as but not limited to Facebook applications, AI apps, and software apps like Microsoft Offices. This has been confirmed and conversely discussed in the study of Berkowsky and van Deursen (2016) that the absence of digital self-efficacy would lead to blocking digital skills. Hence, it is becoming essential that school leaders should enhance their knowledge and interest in the use of digital tools. This can further be explained in the context of the personal willingness of individuals to complete their tasks, especially when facing challenges along digitalization (Rosales et al., 2024).

P. Level of Digital Self-Efficacy of the School Head-Respondents Along with Problem-Solving Confidence

Table 16

Level of Digital Self-Efficacy		Frequency	Percent
17 - 20	Strongly Confident	13	28.9
13 - 16	Confident	0	0.0
9 - 12	Somewhat Confident	24	53.3
4 - 8	Not Confident	8	17.8
Total		**45**	**100.0**

For the education sector, this means there is an urgent demand for professional development that prepares school leaders around practical digital skills and problem solving. By providing mentorship opportunities through peer learning and collaboration, it is likely that it can better reach the 17.8% of school heads who classify themselves as "Not Confident," while at the same time supporting the "Strongly Confident" school heads. This tailored approach could help school leaders to use digital tools more effectively, potentially providing a pathway to embedding technology in classrooms, data-driven decision-making, and more effective school leadership and management.

Q. Level of Digital Self-Efficacy of the School Head-Respondents Along with Efficacy in Digital Setting

Table 17

Level of Digital Self-Efficacy		Frequency	Percent
17 - 20	Strongly Confident	28	62.2
13 - 16	Confident	11	24.4
9 - 12	Somewhat Confident	6	13.3
4 - 8	Not Confident	0	0.0
Total		**45**	**100.0**

The data reveals that school head-respondents foresee themselves as capable of implementing technology-driven strategies to enhance teaching and learning processes. This confidence is crucial as it empowers them to take proactive steps in leading their schools toward a more digitally integrated future. Though DSE may seem to be subjective (Peiffer et al., 2020), it still has an impact on their leadership roles.

R. Relationship Between School Head's Level of Digital Competency and their Profile

The data include several variables, such as age, sex, educational attainment, years of service as a school head, school location, and others, along with their corresponding correlation coefficients (r) and p-values. Remarkably, the age of the respondents shows a weak negative correlation (r = -0.329) with a p-value of 0.017, indicating a statistically significant relationship; this suggests that as age increases, digital competency may decrease. All other variables are not significantly related as presented in the table. The result of the study is consistent with Laouni (2023), who studied about the school principals with similar findings, that as the principals get older, they do not exhibit digital competence, particularly in utilizing modern educational technologies and online communication tools. This trend suggests that older principals may struggle to keep up with rapid technological advancements, which can hinder their ability to implement effective digital strategies in their schools. The lack of familiarity with new platforms may affect their decision-making and leadership in fostering a digital learning environment.

Table 18

Profile	Technical Skills		Digital Leadership and Strategies		Instruction Technology		Digital Communication and Collaboration		Problem Solving and Innovation		Ethical and Legal Use of Technology	
	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value
Age[1]	-.329[s]	.017	-.047[ns]	.737	-.219[ns]	.113	.043[ns]	.760	-.213[ns]	.122	-.117[ns]	.374
Sex[2]	2.067[ns]	0.292	1.534[ns]	.841	1.354[ns]	.633	.548[ns]	.642	1.241[ns]	.733	1.455[ns]	.879
Educ. Attainment[1]	-.143[ns]	.312	-.134[ns]	.348	-.058[ns]	.683	-.178[ns]	.211	-.269[ns]	.057	-.167[ns]	.215
Specialization[2]	1.112[ns]	0.933	1.534[ns]	.841	4.184[ns]	.999	1.657[ns]	1.000	5.198[ns]	.844	8.840[ns]	.655
No. of Years as SH[1]	0.000[ns]	1.000	-.138[ns]	.314	-.192[ns]	.155	-.195[ns]	.153	-.184[ns]	.174	-.176[ns]	.174
School Location[2]	7.091[ns]	0.242	1.112[ns]	.933	4.524[ns]	.695	1.372[ns]	.851	8.039[ns]	.159	10.497[s]	.225
Geo Location[2]	6.439[ns]	0.486	2.826[ns]	.470	7.401[ns]	.329	.889[ns]	1.000	5.755[ns]	.617	6.570[ns]	.866

Significant at 0.05 significance level
1 – Kendall's Tau, 2 – Fisher's Exact Test, s-significant, ns-not significant

S. Relationship Between School Head's Level of Digital Self-Efficacy and Their Profile

Table 19

Profile	Confidence		Ability		Self-Regulation		Problem		Efficacy	
	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value	r/χ^2-value	p-value
Age[1]	-.228[ns]	.089	-.100[ns]	.450	-.138[ns]	.298	-.118[ns]	.376	-.262[ns]	.050
Se[x][2]	.646[ns]	.830	2.958[ns]	.421	1.030[ns]	.726	1.116[ns]	.658	2.741[ns]	.322
Educ. Attainment[1]	-.056[ns]	.682	.069[ns]	.610	-.110[ns]	.419	-.112[ns]	.411	-.090[ns]	.513
Specialization[2]	4.835[ns]	.632	7.167[ns]	.707	3.300[ns]	.902	3.310[ns]	.924	4.449[ns]	.703
No. of Years as SH[1]	-.190[ns]	.149	-.211[ns]	.103	-.183[ns]	.161	-.107[ns]	.409	-.260[s]	.047
School Location[2]	5.956[ns]	.418	6.057[ns]	.776	13.029[s]	.023	4.087[ns]	.700	6.366[ns]	.373
Geo Location[2]	6.041[ns]	.373	4.928[ns]	.933	6.836[ns]	.278	2.392[ns]	.961	3.600[ns]	.769

Significant at 0.05 significance level
1 – Kendall's Tau, 2 – Fisher's Exact Test, s-significant, ns-not significant

On the contrary, in the study among the Morrocan principals, Laouni (2023) puts forth that the more the principals get older, they become less digitally confident in managing their schools. However, this situation is different from the elementary school heads in the Division of Catbalogan City who felt that they were more capable of managing their schools with the use of digital tools (messenger, Google Forms and Microsoft) because of their experience. This holds true that elementary school leaders in the Division are more confident with their capability in exploring and navigating digital tools for they could accept and utilize digitization despite of age factor, for age equates to more

experiences not only in life but in leading a school and its components.

Furthermore, the school location of the school head-respondents displays a significant positive relationship with the dimension on self-regulation relative to the DSE of the respondents (13.029, p=0.023). This suggests that school heads in certain geographic areas may benefit from more supportive environments that enhance their self-regulatory skills, which in turn boosts their confidence in using digital tools effectively. The implications of this finding are profound, as it indicates that location may play a crucial role in shaping the professional development opportunities available to school leaders.

Additionally, schools situated in urban areas may have greater access to resources and training programs, fostering a culture of continuous improvement and adaptability. In contrast, heads of schools in rural or less-resourced areas might face challenges that hinder their ability to develop strong self-regulation skills. This experience of the elementary school heads in Catbalogan City division relates to the theory of David Kolb, the Experiential Learning Theory (1984) in which case, they have the concrete experience of being able to create reports that require them to extract their knowledge with the availability of internet. As such, during the Reflective Observation phase, school heads reflect on their experiences using digital tools, identifying both successes and areas for improvement. They share insights about what worked well in their reporting processes and where they faced obstacles.

Moving to Abstract Conceptualization, they begin to draw conclusions about the importance of digital competencies and how these skills can enhance their leadership effectiveness. They may conceptualize strategies for integrating technology into their daily practices, recognizing that improved digital skills can lead to better communication and collaboration with teachers and students.

Finally, in the Active Experimentation phase, these school heads apply their new insights by implementing innovative digital practices in their schools. For instance, they might introduce online platforms for teacher collaboration or utilize digital resources for professional development. Through this cycle of experiential learning, they not only improve their own self-efficacy but also contribute to a more tech-savvy and adaptive school environment, ultimately enhancing the educational experience for their students.

T. Relationship Between School Head's Level of Digital Competency and their Level of Digital Self-Efficacy

The findings on the correlation between digital competency and digital self-efficacy (DSE) among the school head-respondents illustrate that respondents' digital competence in technical skills is not significant (0.252 with a p-value of 0.079), indicating that school head-respondents are not that confident in their technical skills relative to the use of digital tools or technology in their leadership, planning, and implementation in the educational setting. This result may have the biggest impact in the overall effectiveness of digital initiatives within their schools. When school leaders lack confidence in their technical abilities, they may hesitate to adopt new technologies or fully integrate them into their educational practices. This reluctance can hinder innovation, limit professional development opportunities for teachers, and ultimately affect student engagement and learning outcomes. Therefore, addressing this gap in digital self-efficacy is crucial for empowering school heads to lead more effectively in an increasingly digital educational landscape.

Table 20

Level of Digital Competencies	Level of Digital Self-Efficacy									
	Confidence		Ability		Self-Regulation		Problem		Efficacy	
	r-value	p-value	r-value	p-value	r-value	p-value	r-value	p-value	r-value	p-value
Technical Skills	.252ns	.079	-.087	.538	.316s	.027	.201	.158	.197	.169
Digital Leadership and Strategies	.470s	.001	.362s	.011	.527s	.000	.419s	.004	.609s	.000
Instruction Technology	.474s	.001	.558s	.000	.630s	.000	.511s	.000	.451s	.002
Digital Communication and Collaboration	.508s	.000	.541s	.000	.537s	.000	.531s	.000	.592s	.000
Problem Solving and Innovation	.673s	.000	.293s	.038	.640s	.000	.520s	.000	.491s	.001
Ethical and Legal Use of Technology	.660s	.000	.352s	.009	.593s	.000	.541s	.000	.410s	.003

Significant at 0.05 significance level

However, the Problem Solving and Innovation dimension has the strongest positive relationship with confidence in digital self-efficacy (.673s, p=.000) of school head-respondents. This goes to show that as school heads develop their skills in problem-solving and innovation, their confidence in utilizing digital tools effectively significantly increases. This strong correlation suggests that fostering these competencies is crucial for enhancing leaders' self-efficacy in a digital environment. It implies that school heads who are adept at navigating challenges and innovating solutions are more likely to feel empowered in their digital practices, which can lead to more effective integration of technology in their schools. This can be likened to the study among the school administrators of Sakarya, İzmit and İstanbul where school administrators are able to lead their school's using technology like the submission of lesson plans through e-mails, communicate using messenger platform, and share resources using Google Drives (Ugur & Koc, 2019).

4. Conclusion

The researcher had to run down the results of the study to unfurl the significant data as presented in the previous chapter. A conclusion was derived from yielding substantial recommendations that would benefit those who have similar concerns.

1. This research highlights the critical role of digital competency among school heads in fostering effective educational environments. As the landscape of education continues to evolve with technological advancements, school leaders must not only embrace digital tools but also model their use to staff and students. The findings indicate that school heads who possess strong digital skills are better equipped to lead and implement innovative teaching strategies, enhance communication, and drive school improvement initiatives.
2. Furthermore, research indicates that as school heads age, they tend to show lower levels of digital

competence, especially in using modern educational technologies and online communication tools. This trend implies that older principals may find it challenging to keep pace with the fast evolution of technology, potentially impairing their ability to implement effective digital strategies in their schools. Their unfamiliarity with new platforms could negatively impact their decision-making and leadership in creating a digital learning environment (Laouni, 2023). In contrast, Laouni (2023) found in a study of Moroccan principals that as they age, they tend to become less confident in their digital management skills. However, this differs from the elementary school heads in the Division of Catbalogan City, who reported feeling more capable of using digital tools (such as Messenger, Google Forms, and Microsoft) to manage their schools, attributing this confidence to their experience.

3. This study indicates that school heads in specific geographic regions could benefit from more supportive environments that strengthen their self-regulatory skills, thereby increasing their confidence in effectively using digital tools. These findings have significant implications, suggesting that location may significantly influence the professional development opportunities accessible to school leaders. Moreover, schools located in urban areas often have better access to resources and training programs, promoting a culture of continuous improvement and adaptability. In contrast, school leaders in rural or under-resourced areas may encounter obstacles that impede their ability to cultivate strong self-regulation skills. This disparity highlights the necessity for targeted interventions and support systems designed to meet the specific needs of school heads according to their geographic context. Ultimately, improving self-regulation among school leaders in diverse settings could enhance the implementation of digital initiatives, positively impacting the overall educational landscape.
4. Furthermore, the study highlights the importance of offering professional development focused specifically on technical skills in digital competencies for school leaders. Educational institutions could invest in training programs that equip school heads to effectively tackle digital challenges. By emphasizing digital literacy, school leaders can greatly influence both teacher and student outcomes, preparing their institutions to meet the demands of the 21st century.

5. Recommendations

Based on the findings of this research, several key recommendations can be made to enhance the digital competency of school heads:

1. There could be an integration of digital competencies in leadership standards. Since school heads are expected to possess digital competencies, the Department of Education should include these as a fundamental component of leadership standards. This integration will highlight the significance of these skills in both the recruitment and evaluation of school leaders. Assign older school heads with colleagues who are digitally savvy or young leadership in education for permanent
2. Incorporating mentorship and peer support as a strategy to develop the digital competence and self-efficacy of school heads presents a sustainable and collaborative approach to professional growth. Since the result of this study shows that there are some competent school heads in Catbalogan City Division, they can serve as mentors for those who are still in developing and not competent level of their digital competence training and interaction. This peer support can serve to fill the gaps in knowledge gaps and encourage joint innovation. This recommendation emphasizes the creation of mentorship programs where experienced educational leaders share their knowledge and skills in digital technologies, instructional innovation, and leadership practices with their peers or less experienced school heads. Through structured peer support groups, participants can exchange best practices, solve problems collaboratively, and gain confidence in applying digital tools within their institutions. Such programs foster a culture of continuous learning and collective growth, enhancing digital leadership capabilities and promoting self-efficacy.
3. Significantly, in the context of geographically diverse or underserved areas, particularly rural schools, access to resources based on school location emerges as a critical recommendation. Making sure urban, rural, and remote schools in Catbalogan City Division of DepEd have equal access to digital tools, reliable internet connectivity, and professional development opportunities that fit their unique needs is key. Rural schools, for example, might find solutions like satellite internet or community-based teacher training, while urban schools might look to up the ante on advanced tech like social data analytics. Tackling site-specific challenges helps school heads ensure health and safety are honored so that they can confidently use digital tools, thus establishing a level of openness and innovation within their institutions.
4. The findings in this research suggest that elementary school heads in the Division of Catbalogan City could have technology-based training which will focus on improving digital technical skills such as but not limited to the use of digital devices (laptops, personal computers, tablets,) and software applications (word processors, spreadsheets, presentation tools). The researcher proposed technology-based training called as Project I-LEAD (Innovative Leadership and Empowerment Along Digitization) to school heads. The training program for school heads is structured to enhance essential digital competencies across various

components.

A. Project I-Lead

The findings in this research suggest that elementary school heads in the Division of Catbalogan City should have technology-based training that focuses on improving their Technical Skills, Digital Leadership and Strategies, Instruction Technology, Digital Communication and Collaboration and Problem-Solving Innovation, and Ethical and Legal Use of Technology.

The researcher made a training program for the elementary school heads of Catbalogan City Division that caters to the findings of this research. The technology-based training program will be called Project I-LEAD (Innovative Leadership and Empowerment Along Digitization) for School Heads. The training program for school heads is structured to enhance essential digital competencies across various components and that is based on the results and findings of this research.

Project Title: Project I-LEAD (Innovative Leadership and Empowerment Along Digitalization) FOR SCHOOL HEADS

1) Rationale

Project I-LEAD (Innovative Leadership and Empowerment Along Digitalization) emerges from the timely need to build the capacity of school heads for skills and competency in addressing educational leadership challenges and complexities in an age of digitization. Under the fast digital revolution in schools, effective school leadership determines how technology becomes a part, driving innovation as well as engaging the varied concerns of teachers, learners, and communities.

Most school heads have trouble in applying digital tools to solve problems, make decisions, and perform administrative duties. Project I-LEAD focuses on empowering school leaders by developing their digital capacities, enabling them to freely manage the needs of contemporary educational systems.

With the growing use of digital technologies and platforms by schools, the leaders need to be prepared to lead their schools through this process. Project I-LEAD aims at developing creative leadership patterns suitable for technology-based settings so that the heads of schools can drive their schools into a digital future of efficiency and flexibility.

Digital leadership is increasingly seen as an international priority, echoing the need for education leaders to shift towards the changing role of technology in teaching and learning. Project I-LEAD emphasizes the necessity of providing training and support in line with international standards and taking into consideration local contexts.

The project promotes sustainable leadership building so that heads of schools will be equipped to handle not only today's issues but also the ability to sponsor upcoming leaders throughout the digitalization journey.

2) Objectives

1. To advance school heads' proficiency in operating digital tools and applications for administration, instruction, and decision-making.
2. To enhance their ability to facilitate and implement technology-influenced instruction and learning initiatives.
3. To bolster school heads' self-assurance and competence in utilizing technology to address complex problems and create new solutions for school management and teaching delivery.
4. To equip school leaders with the information required to uphold ethical expectations in technology applications, responding to issues like privacy, security, and accessibility.

Table 21

MATRIX FOR TECHNOLOGY-BASED TRAINING PROGRAM FOR SCHOOL HEADS
Project I-LEAD (Innovative Leadership and Empowerment Along Digitalization for School Heads)
MATRIX OF ACTIVITIES

Components	Objectives	Content Focus	Time Frame	Expected Outputs
Technical Skills	To develop the technical proficiency of participants in utilizing digital tools and platforms, enabling them to effectively integrate technology into educational leadership practices, administrative tasks, and instructional strategies.	Familiarization with commonly used software applications like Microsoft Office Suite (Word, Excel, PowerPoint) and Google Workspace (Docs, Sheets, Slides).	Day 1 (Morning)	Improved Technical Skills
Digital Leadership and Strategies	To empower participants with the knowledge, skills, and confidence required to lead digital transformation in their schools, fostering innovation, collaboration, and ethical technology use to improve educational outcomes and operational efficiency.	Understanding the roles and responsibilities of a Digital Leader	Day 1 (Afternoon)	Technology-Integrated Action Plan
Instruction Technology	To Equip leaders with instructional technology strategies	Integration of Technology in Leadership	Day 2 (Morning)	Proficiency in creating and managing digital content for teaching (e.g., videos, online quizzes, presentations).
Digital Communication and Collaboration	To enhance digital communication and collaboration skills	Tools for Digital Communication (e.g., MS Teams, Zoom)	Day 2 (Afternoon)	Demonstration of effective collaboration tools, such as Microsoft Teams, Google Workspace, or other platforms, to streamline teamwork and project management.
Problem-Solving Innovation	To empower participants to develop innovative problem-solving skills through the effective use of digital tools and technologies, fostering their ability to analyze complex issues, design creative solutions, and implement digital strategies to enhance outcomes in their professional or organizational contexts.	Implementing digital solutions for administrative tasks (e.g., using management software for scheduling, budgets, and communication	Day 3 (Morning)	Mastery of specific digital technologies to implement innovative solutions (e.g., Learning Management Systems, data analytics tools).
Ethical and Legal Use of Technology	Ensure participants are aware of ethical and legal considerations in technology use.	Understanding data privacy laws such as RA 10173 or the Data Privacy Act of 2012 in the Philippine context	Day 3 (Afternoon)	Participants gain a clear understanding of ethical principles and legal responsibilities in using technology in the educational setting.

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