

Teachers' Digital Orientation and Pupils' Learning Performance



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ABSTRACT: In today's fast-changing world, technology has become an important part of teaching and learning. This study aimed to assess the digital orientation of teachers and their relationship with pupils' learning performance. Specifically, it evaluated teachers' access to technology, digital literacy, creative use of technology, and their perceptions. A correlational and causal-comparative design with documentary analysis was employed, targeting 154 teachers from two central schools which were selected through stratified random sampling. Data were gathered using a validated and reliability tested questionnaire and analyzed using Mean, Standard Deviation, Pearson Product Moment Correlation Coefficient, and Multiple Linear Regression. Results showed that teachers' digital orientation and skill on creative use of technology have the most significant impact on pupils' learning performance. Access to technology, digital literacy, and techno-centric perceptions showed no significant direct effect. The study concludes that the way teachers apply technology in lessons is more crucial than simply having access to it. It is recommended that continuous training programs be provided to enhance teachers' ability to integrate technology effectively in the classroom.

KEYWORDS: digital literacy, learning performance, pupils, teachers, techno-centric capability

I. INTRODUCTION

In today's fast-changing digital world, technology plays a vital role in various aspects of life, including education. Technology has helped many advancements across different fields globally over the last two decades (Hillyer, 2023). Schools are increasingly incorporating technological tools like computers, interactive whiteboards, specialized software, and internet connectivity to enrich the learning experience for pupils. Using technology in education has changed traditional teaching methods, giving teachers new tools and resources to improve learning for pupils. Technology helps teachers make lessons more interactive and engaging, customize teaching to fit different pupils' needs, and find lots of information and educational materials. This shift towards using more technology in education creates a more dynamic and cooperative learning environment and helps pupils develop important digital skills for the future.

According to the 2023 UNESCO Global Education Monitoring Report technology helps pupils from far areas when meeting in person is hard to do. However, the report also says that many countries, especially developing ones like the Philippines, still struggle with access to fast internet, gadgets, and other resources. In 2022, the internet speed in the Philippines improved, reaching 25.12 Mbps in December, up from 19.2 Mbps in 2021. According to Kang (2023), the Philippines still has the slowest internet speed compared to other countries, ranking fifth among ASEAN neighbors and below the global average of 36.74 Mbps. Aside from the slow internet connection, the country also experiences a lack of books, computers, and advanced ICT materials that aid teaching and learning.

In 2019, The Department of Education, Region 7 represented by Isiah Wagas, an education program supervisor expressed this in an article published at SunStar Cebu that about 5,000 schools do not even have electricity to begin with (Bai, 2023). Furthermore, some teachers are hesitant to switch to more modern teaching strategies for the belief that their traditional ways have delivered the learning outcomes expected of them. Thalberg, (2019) and Mendoza (2022) believed that this can be caused by varied factors, one of which is the teachers' lack of knowledge or training on the proper use of these technologies.

Like Thalberg (2019) and Mendoza (2022), Hughes (2023), confirmed that teachers struggle with adapting to new learning modalities and paperless lesson delivery. Despite the clear benefits of technology in education, the shift to digital

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teaching exposed significant gaps in teachers' techno-centric capabilities. Even with training and workshops, some teachers found it challenging to use new digital tools, create engaging lessons, and maintain pupil interest. This highlights the need for continuous practice and support in integrating technology into teaching, as unforeseen challenges may arise in the future.

Moreover, in exploring Teachers' Digital Orientation and Pupils' Learning Performance, several research gaps need to be addressed. Firstly, it is unclear how access to technology impacts a teacher's ability to use it effectively. This includes examining whether some teachers have better access to technology than others and if this unequal access affects their ability to incorporate technology into their teaching methods. Secondly, there is a need to assess teachers' digital literacy and its connection to their techno-centric capability. Understanding how proficient teachers are with digital tools and online platforms is crucial for improving teaching strategies. Thirdly, there is a gap in understanding how teachers use technology creatively and innovatively. It is important to investigate whether teachers who employ technology in more creative ways have a positive impact on their pupils' academic performance. Lastly, the research gap extends to understanding the impact of teachers' techno-centric perceptions on pupils' academic performance. Teachers' perceptions towards technology play a significant role in shaping their teaching methods.

Thus, this study aimed to investigate the impact of teachers' techno-centric capabilities on pupils' academic performance. By exploring how teachers utilize technology in their instructional strategies, this study sought to identify best practices and potential areas for improvement. The results would offer valuable perspectives on how teachers could use technology to improve their teaching approaches, ultimately leading to better learning outcomes for pupils. In the 21st century, where digital literacy is crucial, this study would contribute to the ongoing efforts to equip teachers with the necessary skills to effectively integrate technology into their classrooms.

This study was supported by Bandura's Social Learning Theory (1977). As expressed by Bandura, most human behavior is picked up through modeling, imitation, and observation (Kurt,2020). The Theory of Social Learning combines imitation and observation to explain how people act. Based on the theory, people learn socially in addition to learning educationally. This means that rather than only gaining knowledge from books, it can also be learned from classmates, parents, instructors, coaches, and so on (Main,2022). Addressing Teachers' Techno-centric Capability and Pupils' Academic Performance, this theory helped understand how teachers' confidence in their technological skills and how they demonstrate technology use affect pupils' academic performance. By looking at the social and cognitive factors that influenced teachers' techno-centric capabilities, it became clear how these factors impacted pupils' success.

In the context of this study, academic performance as determined by various approaches is the main focus, following DepEd Order (DO) No. 8, s. 2015 A system to assess pupils based on three main components was established by an order titled Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program. Written works, performance tasks, and quarterly exams make up the structure. In these components, every subject has a different percent weight highlighted.

Accordingly, to assess pupils' understanding at different points in each quarter. The summative assessment continues to take the shape of performance tasks and written tests every quarter. Quizzes and lengthy/unit examinations with written assignments will be used to evaluate pupils' fundamental knowledge and comprehension. The limits of the cognitive process should be covered by the distribution of points (DepEd Order No. 8, s. 2015). However, performance tasks are related to assessment tasks that let pupils demonstrate their knowledge and may be used in various contexts. Among the performance tasks, could be demonstrations, group presentations, speaking, and exploration systems. It is important that written work might be considered to be performance tasks (DepEd Order No. 8, s. 2015).

II. METHODOLOGY

This study employed a correlational and causal design with documentary analysis, using a quantitative approach to explore the relationship between teachers' techno-centric capability and pupils' academic performance. The correlational design examined the degree to which teachers' techno-centric skills are associated with variations in pupils' academic outcomes. According to Creswell and Creswell (2018), correlational research seeks to identify relationships between variables without inferring causation.

Additionally, the causal design determined whether teachers' use of technology has a direct impact on pupils' performance. Causal research, as explained by Spector (2019), involves manipulating one variable (the cause) to observe changes in another variable (the effect), thus establishing a cause-and-effect relationship under controlled conditions.

This combination of designs was particularly suitable for exploring the connections between teachers' techno-centric capability and pupils' academic performance within City Central School and West City Central School, located in the Cagayan de Oro City division, for the school year 2023-2024.

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The following statistical tools were used to analyze the data for each problem. Problems 1 and 2 utilized Mean and Standard Deviation in analyzing level of teachers' techno-centric capability specifically and pupils' academic performance. Problem 3 utilized Pearson Product Moment Correlation Coefficient or Pearson r to analyze the significant relationship between the independent variables and the dependent variables based on its significant level and critical value. Problem 4 used Multiple Linear Regression analysis to determine which of the independent variables influenced, either singly or in combination, the pupils' academic performance.

III. RESULTS AND DISCUSSION

Problem 1. What is the level of teachers' digital orientation in terms of:

- 1.1. access to technology;
- 1.2. digital literacy;
- 1.3. creative use of technology; and
- 1.4. techno-centric perceptions?

Table 1: Overall Teachers' Digital Orientation

Variable	Mean	SD	Description	Interpretation
Access to technology	3.68	0.56	Often	High
Digital Literacy	3.80	0.56	Often	High
Creative use of technology	3.62	0.55	Often	High
Techno-centric perceptions	4.27	0.53	Always	Extremely High
Overall Mean	3.84	0.55	Often	High

Note: 4.21-5.00 Extremely High 3.41-4.20 High 2.61-3.40 Moderate 1.81-2.60 Low 1.00-1.80 Extremely Low

Table 1 shows the overall teachers' digital orientation. It registered an overall Mean of 3.84 with SD=0.55, described as Often and interpreted as High Level. This data indicates that teachers possess a strong ability to utilize and integrate technology, enhancing the enjoyment, engagement, and productivity of their teaching and learning sessions with pupils. A key aspect of a teacher's role is to adapt and embrace change, as it is an inevitable part of the educational landscape. Consequently, they must consistently seek opportunities for professional development and stay informed about various elements necessary for fulfilling their responsibilities.

Technology has helped many advancements across different fields globally over the last two decades (Hillyer, 2023). Schools are increasingly incorporating technological tools like computers, interactive whiteboards, specialized software, and internet connectivity to enrich the learning experience for pupils. Using technology in education has changed traditional teaching methods, giving teachers new tools and resources to improve learning for pupils. Technology helps teachers make lessons more interactive and engaging, customize teaching to fit different pupils' needs, and find lots of information and educational materials. This shift towards using more technology in education creates a more dynamic and cooperative learning environment and helps pupils develop important digital skills for the future.

In the same table, the highest rated variable is Techno-Centric Perceptions with the Mean of 4.27 with SD=0.53, described as Always and interpreted as Extremely High Level. These findings suggest that teachers are receptive to acquiring new knowledge and skills, particularly concerning technological advancements that can assist them and their pupils in their educational endeavors and interactions. It is essential for teachers to adopt a proactive mindset, as this will motivate them to pursue the necessary knowledge and skills, ultimately benefiting both themselves and their pupils.

Teachers' perceptions of technology affect how they use it in teaching. Those with a positive mindset are more likely to explore and use digital tools, while some still underutilize them despite knowing their benefits. This emphasizes the need for schools to create a supportive environment that encourages teachers to embrace educational technology. Promoting continuous learning can help both teachers and pupils fully benefit from technological advancements in education (McGovern, 2024).

Meanwhile, the lowest rated variable is *Creative use of Technology* with the Mean of 3.62 with SD=0.55, with the description of Often and the interpretation of High Level. The findings indicate that there remains considerable opportunity for teachers to enhance their knowledge and skills in effectively leveraging technology within classroom discussions. Time

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management emerges as a crucial factor that can influence teachers in these contexts. Integrating innovative and suitable technology into teaching and learning methodologies may require a significant investment of time. While an abundance of online resources exists, finding materials that align with, contextualize, and localize to pupils' needs can pose challenges, particularly when considering the diverse abilities and capacities of learners.

In the conduct of the study of Damanik and Widodo (2024), they explored the link between digital literacy, teaching creativity, and teachers' professional performance. They found that digital literacy significantly impact teaching quality and performance. The study proposed a model showing that improving digital literacy could enhance teaching creativity and, in turn, teacher performance. This indicates that supporting teachers in developing their digital skills could lead to better educational outcomes.

Problem 2. What is the pupils' level of learning performance for School Year 2023-2024?

Table 2 on the next page shows the Pupils' Overall Learning Performance. It registered an overall Mean of 86.36 with SD=3.09, and interpreted as Very Satisfactory Level. This data implies that the performance gained by the pupils was at second highest level of academic performance. Moreover, 30% of the pupils' performance were at Satisfactory level, 26% of the pupils were at Outstanding Level, 23% of the pupils were at Fairly Satisfactory Level and 21% of the pupils were at Very Satisfactory Level. Considering that there are pupils performing at critical levels, specifically achieving a moderately satisfactory standard, this data suggests that teachers may want to introduce supplementary measures such as intervention programs and remedial classes. While it is possible that these pupils have garnered enough points to fulfill the requirements, they may also possess skills that require further development, which could affect their performance as they advance to higher levels of education. Consequently, it is essential for teachers to remain vigilant and considerate of pupils facing challenges.

Delaney (2024) emphasized that learning performance was crucial for the development of pupils as they transitioned into adulthood. Those who did well in school were more likely to achieve success in their future careers. Teachers played a central role in influencing pupils' academic performance by fostering their understanding of key concepts and encouraging a desire to succeed. Additionally, various factors, both intellectual and non-intellectual, contribute to predicting how well pupils would perform academically. This shows that the role of teachers extend beyond just delivering lessons, as they also help shape pupils' academic awareness and motivation.

Table 2: Pupils' Overall Learning Performance

Level of Academic Performance	Frequency	Percentage	Mean	SD	Interpretation
Outstanding	40	26	86.38	3.09	Very Satisfactory
Very Satisfactory	33	21			
Satisfactory	46	30			
Fairly Satisfactory	35	23			
Did Not Meet Expectations	0	0			
Total	154	100.00			

Note: 90-100 Outstanding 85 – 89 Very Satisfactory 80 – 84 Satisfactory
75 – 79 Fairly Satisfactory 74 & below Did not Meet Expectations

According to Fenn (2019), learning performance is essential for both the teachers and the pupils as it will have them the view of the things, they need to give more focus in the next school year in order to have much better rating. Academic performance will also help the teachers on things to prepare and do better should they plan for intervention programs or remedial classes to help struggling pupils. Gloria and Benjamin (2020) added that this will also help the school heads identify the teachers who need more assistance and guidance for improvements and much better work performance.

Problem 3. Is there a significant relationship between the teachers' digital orientation and pupils' learning performance?

Table 3 shows the Test Correlation on digital orientation and learning performance. There were four (4) sub-variables under teachers' techno-centric capability tested towards the learning performance of the pupils in this study. For *Access to technology*, it registered a computed r-value of 0.459 and corresponding p-value of 0.001 with the interpretation of Low Positive Correlation. The computed p-value is less than the p-critical value at 0.05 level of significance. Thus, the null hypothesis is rejected. The findings suggest a significant correlation between teachers' access to technology and the academic achievement of

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their pupils. Although this correlation is modestly positive, the favorable effects on pupil outcomes underscore the necessity of prioritizing this access. Additionally, there are numerous further advantages that teachers can explore for both themselves and their pupils, contributing to enhanced growth, development, and overall success.

Table 3: Test Correlation on Digital Orientation and Learning Performance

Variables	r-value	p-value	Level of Correlation	Decision	Interpretation
Access to technology	0.459	0.001	Low Positive Correlation	Reject Ho	Significant
Digital Literacy	0.417	0.011	Low Positive Correlation	Reject Ho	Significant
Creative use of technology	0.635	0.001	Moderate Positive Correlation	Reject Ho	Significant
Techno-centric perceptions	0.434	0.014	Low Positive Correlation	Reject Ho	Significant

Note: 0.91 - 1.00 Very High Positive Correlation 0.71 – 0.90 High Positive Correlation
 0.51 – 0.70 Moderate Positive Correlation 0.31 – 0.50 Low Positive Correlation
 0.00 – 0.30 Negligible Positive Correlation *Significant when computed p-value <0.05*

Access to technology helps teachers create engaging lessons and improve student learning. When educators have the necessary tools, they can enhance their teaching methods and support pupils more effectively. Providing training and resources allows teachers to develop their digital skills and confidently integrate technology into their classrooms. This helps maximize the benefits of digital tools for both teachers and students. Snyder (2024) emphasized that teachers with greater confidence in using technology are more effective in improving student performance.

For *Digital Literacy*, it registered a computed r-value of 0.417 and corresponding p-value of 0.011 with the interpretation of Low Positive Correlation. The computed p-value is less than the p-critical value at 0.05 level of significance. Thus, the null hypothesis was rejected. These findings suggest that the integration of digital literacy by educators is positively correlated with the learning performance of their pupils. Although this correlation is weak, its positive in nature warrants significant attention and consideration. Moreover, teachers can explore additional advantages of technology that could foster greater growth, development, and improved outcomes for both them and their pupils.

Teachers' digital literacy enhances lesson delivery and pupil learning. Developing digital skills helps teachers create engaging lessons and maximize technology's benefits. While the effect may be small, improving digital literacy supports better teaching methods and pupil outcomes. Providing training and resources ensures teachers can effectively integrate technology into their classrooms. Leksansern et al. (2023) emphasized that strong digital skills are essential for teachers to enhance both their teaching and pupils' academic success.

For *Creative use of Technology*, it registered a computed r-value of 0.635 and corresponding p-value of 0.001 with the interpretation of Moderate Positive Correlation. The computed p-value is less than the p-critical value at 0.05 level of significance. Thus, the null hypothesis is rejected. The research indicates that the creative application of technology by teachers is positively correlated with pupils' learning performance. This beneficial correlation warrants increased attention and action due to the significant advantages it brings, particularly from a positive perspective. To foster greater growth, development, and favorable outcomes, teachers should further explore this area to better understand the benefits it offers to both themselves and their pupils.

Benlaghrissi and Ouahidi (2024) investigated the impact of combining technology-assisted learning with project-based learning. Their study showed that using combining technology for projects significantly improved pupils' speaking and creative skills compared to traditional methods. This suggested that integrating modern technology with hands-on projects enhanced pupils' language skills, engagement and even on their creativity. Teachers who creatively used technology-based tools in project-based learning achieved better results in pupil performance.

For *Techno-centric Perceptions*, it registered a computed r-value of 0.434 and corresponding p-value of 0.014 with the interpretation of Low Positive Correlation. The computed p-value is less than the p-critical value at 0.05 level of significance. Thus, the null hypothesis was rejected. The findings suggest that pupils' learning performance is positively influenced by their perceptions of technology-oriented professors. While this relationship may demonstrate a modest positive correlation, the beneficial impact on pupils warrants careful consideration and emphasis. Additionally, teachers have the opportunity to explore further advantages for both themselves and their pupils, potentially leading to enhanced growth, development, and outcomes.

Marmoah et al. (2024) stated that the teachers believed that improved digital literacy among them can have positive effect on their performance as well as on their pupils. The teachers further believed that planning, implementing, and evaluating digital literacy training programs will make more enhancements for the teachers. The study found significant improvements in

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teachers' digital skills following these programs. This demonstrated that well-designed training programs could effectively boost teachers' digital literacy and enhance their teaching practices.

Problem 4. Which of the independent variable/s influence/s singly or in combination the pupils' learning performance?

Table 4: Regression Analysis on Digital Orientation and Academic Performance

Variables	UC		SC		t-value	Sig. (P-value)	Decision
	B	SE	B				
Constant	0.4723	0.4066	0.2778		4.4954	0.001	
Access to technology	0.2247	0.1512	0.1012		1.7531	0.132	Accept Ho
Digital literacy	0.0656	0.0712	0.0989		1.2293	0.402	Accept Ho
Creative use of technology	0.8499	0.8952	0.7681		4.4688	0.001	Reject Ho
Techno-centric perceptions	0.1864	0.0863	0.1872		1.9232	0.136	Accept Ho
	R	R ²	Adjusted R ²		f-value	Sig. (P-value)	Decision
Model	0.548	0.417	0.387		9.427	0.001	Reject Ho

Note: UC = Unstandardized Coefficients SC = Standardized Coefficients Dependent Variable = Work Performance
Significant when computed p-value <0.05.

Table 4 presents the regression analysis on digital orientation variables towards learning performance. It is hypothesized that the four (4) predictors will be positively associated with learning performance. Results show that the 41.70% of the variance is explained by the four (4) predictors, $F = 9.427$, $p < .001$. Specifically, *Creative use of Technology* ($\beta = 0.7681$, $t\text{-value} = 4.4688$, $p\text{-value} = < .001$) greatly influences pupils' learning performance. It can be inferred that if the teacher is able to increase their digital orientation in terms of creative use of technology by 1% it will also increase the pupils' learning performance by 38%. This suggest that teacher's digital orientation on creative use of technology can have better academic performance for the pupils.

Teachers are equipped to integrate and align a diverse array of concepts and instructional strategies through the innovative application of technology, enhancing the teaching and learning experience for pupils, making it more enjoyable and engaging. An abundance of pre-prepared resources is readily accessible online, enabling teachers to select and utilize these materials as references. Nevertheless, to effectuate appropriate modifications, it is essential for teachers to consider the intellectual competence and capabilities of their pupils.

Creative integration of technology by teachers improves pupils' engagement as well as learning performance. When teachers effectively utilize digital tools, learning becomes more interactive and impactful. However, balancing technology with traditional teaching methods is essential to maximize its benefits. Providing adequate training and support enables teachers to optimize digital resources, ultimately improving student outcomes (Khlaif et al., 2023; Cornelius, 2024).

On the other hand, access to technology ($\beta = 0.2778$, $t\text{-value} = 1.7531$, $p\text{-value} = 0.132$), digital literacy ($\beta = 0.0989$, $t\text{-value} = 1.2293$, $p\text{-value} = 0.402$), and techno-centric perceptions ($\beta = 0.1872$, $t\text{-value} = 1.9232$, $p\text{-value} = 0.136$) are not significantly associated with pupils' academic performance. This suggests that teacher's digital orientation in terms of access to technology, digital technology and techno-centric perceptions have no bearing on the pupils' learning performance.

This means that in terms of techno-centric capability, they have no significant effect to the pupils' academic performance. This may be due to the fact that what really reaches the pupils' experience is the implementation of the planned activities and created instructional materials that are based on the creative use of technology. The teacher does not need to let the pupils feel if they are sad or appreciative towards technology use and integration during classes. What the pupils see and experience matters the most. However, the importance of these variables should not be taken for granted as they form special part on the teachers' mindset in making and planning activities and instructional materials that are aided with technology gadgets.

Technology in education is most effective when teachers use it thoughtfully in their lessons. Maier (2024) found that simply having digital tools does not guarantee better learning. Instead, well-planned activities that integrate technology in meaningful ways help pupils stay engaged and improve their learning performance. This shows that what truly matters is how teachers apply technology in their teaching, not just their access to it.

IV. CONCLUSIONS

Based on the findings, the following conclusions were drawn:

1. Teachers have the high potential to acquire new technological skills. They perceive technology as an aid in completing their daily task. Hence, they can improve their digital orientation once their creative use of technology is developed.
2. Pupils can improve their learning performance with the aid of technology.
3. Pupils learning performance significantly improves when teachers' skills in creative use of technology such as the utilization of productivity tools are well developed.
4. When teachers' skills in creative use of technology is improved, the learning performance of pupils increases.

V. RECOMMENDATIONS

The study pointed out suggestions and recommendations:

1. Schools may take the lead in providing appropriate support to improve teachers' skills in creative use of technology by implementing their ICT development plan.
2. Schools may provide opportunities for academic support through remedial programs and additional instructional materials.
3. Schools may utilize LAC sessions as an avenue for teachers' professional development to improve their skills on creative use of technology.
4. Teachers may be encouraged to use productivity tools in developing learning materials and integrate technology in instruction to improve learning outcomes of pupils.

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