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Teachers' Perceptions on ICT Infrastructure, Technical and Administrative Support and ICT Self-Efficacy

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ABSTRACT

This study endeavored to determine the perceptions of schools' ICT infrastructure and technical support in relation to self-efficacy of public school teachers in the District of Tangub during the school year 2022-2023.

The quantitative-correlational research design was utilized. Standard questionnaires with modifications were employed in the data gathering processes. The study gathered data from 80 public school teachers from the different public elementary schools in the District of Tangub. Data analysis were done using the weighted average mean. Inferential statistics were treated with Spearman rho correlation.

The instructors assessed the technical and administrative assistance, as well as the IT infrastructure, in their particular schools as being fairly competent. They stated that their degree of ICT self-efficacy was ordinary. The teachers' ICT self-efficacy was substantially correlated with the schools' ICT infrastructure and administrative and technical assistance. The importance of the enabling circumstances, such as technical and administrative assistance, in helping instructors feel confident about using technology into the teaching and learning processes was underlined. To guarantee that instructors apply their ICT skills and expertise and integrate them into the classroom, schools need to pay close attention and place more focus on the infrastructural, technical, and administrative assistance. These circumstances have to be highly suitable to improve and guarantee that teachers may effectively complete their instructional functions integrating ICT.

KEYWORDS: *ICT Infrastructure, Technical and Administrative Support, ICT Self-Efficacy*

INTRODUCTION

Educational institutions have been investing profoundly in the education system to open a wider scope of ICT and create a dynamic ICT environment for learning. In the quest to become a technological literate society, learning institutions are integrating technology into the curriculum to boost the teaching-learning practices. The ICT has been found as an effective tool to improve the teaching-learning process (Bakar, Ayub, Luan & Sabudin) [1]. It has the ability to transform and create innovative pedagogical approaches in the instructional process (Luan, Atan & Sabudin) [2]. Schools have sought the teachers to work in the midst of the latest ICT and to be sufficiently equipped in utilizing ICT for instructional purposes (Luan & Teo) [3]. Chai [4] identified ICT infrastructure, and technical support as conditions to influence teachers' use of ICT and how they perceived themselves as competent in the use of ICT. Successful implementation of technology

integration in teaching depends on several factors, such as infrastructure (Eksail and Afari) [5]. Additionally, the teachers' lack of ICT training was pointed out as one of the factors affecting ICT integration in education (Turgut and Aslan) [6]. It was therefore the objective of the study to determine the extent of relevance of ICT infrastructure and technical and administrative support on the ICT self-efficacy of teachers.

STATEMENT OF THE PROBLEM

This study endeavored to determine the perceptions of schools' ICT infrastructure and technical support in relation to self-efficacy of public school teachers in the District of Tangub during the school year 2022-2023.

METHODOLOGY

The quantitative-correlational research design was utilized. Standard questionnaires with modifications were employed in the data gathering processes. The study gathered data from 80 public school teachers from the different public elementary schools in the District of Tangub. Data analysis were done using the weighted average mean. Inferential statistics were treated with Spearman rho correlation.

RESULTS AND DISCUSSIONS

ICT infrastructure encompasses all the devices, networks, protocols and procedures that are employed in the telecoms or information technology fields to foster interaction amongst different stakeholders. This includes hardware or physical servers, networks, data centers, facilities, and related equipment, which is used to develop, test, operate, monitor, manager and support ICT services. Vanderlinde and van Braak [7] described ICT infrastructure as the availability and sustainability of the ICT tools such as hardware, software, and peripheral equipment provided in the school. In Pelgrum's study [8], ICT infrastructure denotes the availability of equipment, software, internet access and other similar resources in the school.

In Table 1, it can be observed that the participants noted that their ICT infrastructure was adequate inasmuch as their schools inspire teachers to use ICT during teaching to create an ICT based teaching culture as indicated by the weighted average mean of 3.88; encourage teachers to use subject-specific digital teaching aids in teaching with WAM of 3.59; and periodic monitoring of the ICT tools to ensure its efficient utilization of 3.56 WAM. However, the overall mean of 3.26 suggests that in general their respective schools have fairly adequate ICT infrastructure. The presence of fairly adequate ICT infrastructure may result to teachers' not fully and effectively utilizing educational or ICT in their teaching and learning processes. As denoted by Krysa [9] as cited by Moses et al [10], limited software act as one of the antecedents that prevents the use of computers as an instructional tool. In addition, Shiue [11] collaborated the idea that ICT infrastructure can be one of the factors that influence the technology use among the teachers.

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Table 1. Participants' Perceptions on ICT Infrastructure

Statements	Weighted Average Mean	Interpretations
1. ICT tools like hardware, software and peripheral equipment are provided in the school.	3.10	Fairly Adequate
2. There is periodic monitoring of the ICT tools to ensure its efficient utilization.	3.56	Adequate
3. The school encourages teachers to use subject-specific digital teaching aids in teaching.	3.69	Adequate
4. The school inspires teachers to use ICT during teaching to create an ICT based teaching culture.	3.88	Adequate
5. The school keeps budget for the implementation and maintenance of ICT infrastructure.	2.53	Fairly Adequate
6. The school has enough ICT tools and facilities to support ICT integrated pedagogy.	2.80	Fairly Adequate
Overall Mean	3.26	Fairly Adequate

Legend: 4.21 – 5.00 Very Adequate (VA) 3.41 – 4.20 Adequate (A)
2.61 – 3.40 Fairly Adequate (FA) 1.81 – 2.60 Less Adequate (LA)
1.00 – 1.80 Least Adequate (LeA)

In terms of technical support, the overall mean of 3.25 denotes "fairly adequate." This suggests that the teachers experienced fairly adequate technical support as can be seen by the assistance extended to them in terms of access, operation and troubleshooting of hardware, software and network resources with a weighted average mean of 3.23; and the provision of continuous ICT training to teachers with 3.40 weighted average mean. Teachers may have received trainings and professional enhancement but focused on the application and integration of technology in the teaching and learning processes, and not necessarily on troubleshooting of hardware and software which are more of the technical aspects. Technology support has an encouraging impact on the teachers' use of ICT according to Moses et al. [10], and their integration of ICT into the teaching-learning practices as well (Dexter, Seashore & Anderson) [12]. Hence, it is just vital to provide guidance, support and services as parts of the technology applications (Haslaman, Mumcu & Usluel) [13]. Technical support is essential for technology use throughout the curriculum because the lack of it may create difficulties and result in diminished support for the curriculum (Resta) [14].

Table 2. Participants' Perceptions on Technical and Administrative Support

Statements	Weighted Average Mean	Interpretations
1. The school provides specialized skill personnel to support and assist teachers in implementing technology into instruction.	3.10	Fairly Adequate
2. There is assistance in the access, operation and troubleshooting of hardware, software, and network resources.	3.23	Fairly Adequate

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3.	The school is conscious about ICT training for teachers.	3.18	Fairly Adequate
4.	The school provides continuous ICT training to teachers.	3.40	Fairly Adequate
5.	The school encourages teachers to participate in ICT training initiatives.	3.42	Adequate
6.	The school is adequately staffed with trained teachers capable of effective ICT integration.	3.17	Fairly Adequate
	Overall Mean	3.25	Fairly Adequate

Legend: 4.21 – 5.00 Very Adequate (VA) 3.41 – 4.20 Adequate (A)
2.61 – 3.40 Fairly Adequate (FA) 1.81 – 2.60 Less Adequate (LA)
1.00 – 1.80 Least Adequate (LeA)

Teachers are the key actors implementing and integrating at ICT (Ju Joo et al) [15]; (Shonfeld, et al.) [16]. The successful integration of ICT in education depends on teachers' personal readiness to use technological tools (Hatlevik) [17]. Self-efficacy in teaching with ICT provides a foundation for personal comfort in the classroom.

The teachers' ICT self-efficacy evaluation denoted that most of the teachers considered themselves to be average level of self-efficacy. This is evident in the overall mean of 3.25 which is interpreted as "average." Their average level of ICT self-efficacy emanates from their confidence to learn new and adopt innovative operational skills and confidence on their ability to evaluate ICT-based learning processes and products in accordance with curriculum standards. Teo [18] and Hatlevik [19] revealed a positive association between self-efficacy regarding the use of digital tools and the use of ICT for teaching purposes. In addition, Zee and Koomen [20] emphasized that the use of ICT in teaching is directly related to teachers' ICT self-efficacy. However, there are different levels of ICT self-efficacy, depending on whether it is related to ICT skills or to ICT use for instructional purposes (Hatlevik & Hatlevik) [21].

Table 3. Participants ICT Self-Efficacy

	Statements	Weighted Average Mean	Interpretations
1.	Feel confident working on a personal computer, smartphone, educational software and learning management system.	3.22	Average
2.	Feel confident to learn a new ICT operation skill.	3.40	Average
3.	Feel confident in connecting with students using the internet, email, web surfing and youTube.	2.95	Average
4.	Feel confident to develop e-educational content and circulate them among students.	2.80	Average
5.	Feel confident to evaluate learners' ICT-based learning processes and products appropriate to the curriculum.	3.04	Average

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6.	Use correct computer terminology when directing students' computer use.	2.52	Average
7.	Inspires students to participate in ICT integrated classes.	2.88	Average
8.	Plans online instructional processes considering learners' needs.	2.71	Average
9.	Is able to judge trustworthy educational information using ICT (Google, FB, WhatsApp, Twitter, etc.) and share among students.	2.83	Average
10.	Confident to improve teaching using latest ICT tools.	2.56	Average
	Overall Mean	2.89	Average

Legend: 4.21 – 5.00 Very High (VH) 3.41 – 4.20 High (H)
2.61 – 3.40 Average (A) 1.81 – 2.60 Low (L)
1.00 – 1.80 Very Low (VL)

Table 4. Tests for Significant Relationship Between the Teachers' Perceptions on ICT Infrastructure, Technical and Administrative Support and ICT Self-Efficacy

Variables	*Spearman rho* Correlation Coefficient	t-value of r	CV	Decision
ICT Infrastructure and ICT Self-Efficacy	0.377	3.59	1.99	Significant
Technical and Administrative Support and ICT Self-Efficacy	0.398	3.83	1.99	Significant

The Spearman rho correlation coefficient determination yielded the following r_s values: 0.377, and 0.398 which are all significant. The comparison of the t-values of r (3.59, and 3.83) and the critical t-value of 1.99 at 78 degrees of freedom strengthens the significance of r coefficients. Hence, there is a significant relationship between the schools' ICT infrastructure and technical and administrative support and the teachers' ICT self-efficacy.

Esfijani and Zamani [22] found that although teachers have adequate access to hardware in school and at home, they are unable to find software suitable for their teaching. Graham, et al. [23] reported that it is vital to understand why teachers are not integrating ICT into their classrooms to assist in searching for remedies and enhancing ICT adoption. They suggest a need to foster pedagogical changes and improve conceptual understanding in teaching a specific subject. Furthermore, staff training helps improve the teaching and learning processes, and E-learning improves students' skills for career perspectives.

Computer self-efficacy was noted by Loar [24] to be associated with positive learning processes and outcomes, including training effectiveness, perceived ease of use, and intentions to use computers.

CONCLUSIONS AND RECOMMENDATIONS

The instructors assessed the technical and administrative assistance, as well as the IT infrastructure, in their particular schools as being fairly competent. They stated that their degree of ICT self-efficacy was ordinary. The teachers' ICT self-efficacy was substantially correlated with the schools' ICT infrastructure and administrative and technical assistance. The importance of the enabling circumstances, such as technical and administrative assistance, in helping instructors feel confident about using technology into the teaching and learning processes was underlined. To guarantee that instructors apply their ICT skills and expertise and integrate them into the classroom, schools need to pay close attention and place more focus on the infrastructural, technical, and administrative assistance. These circumstances have to be highly suitable to improve and guarantee that teachers may effectively complete their instructional functions integrating ICT.

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