Improving Teachers' Technological Literacy through Five-Step Technology-Driven Instruction Strategy

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ABSTRACT

Technological literacy of teachers in the new normal is deemed necessary in adopting technology-driven instruction strategy to improve learning outcomes. This action research utilizing a purposive sampling aimed to determine teachers' technological literacy level through a five-step technology-driven instruction strategy. The level of teachers' technological literacy before and after implementing the five-step technology-driven instruction strategy is moderate and high. There is a significant difference in teachers' technological literacy before and after implementing a five-step technology-driven instruction strategy. This implies that the five-step technology-driven instruction strategy effectively improves teachers' technological literacy. On this basis, training on five-step technology-driven instruction of teachers may be utilized for teachers' effectiveness in the teaching-learning process using technology in the new normal set-up.

Keywords: teaching-learning, five-step technology-driven instruction, technological literacy, qualitative research, Philippines

INTRODUCTION

The world is challenged with difficulties adapting to new normal ways of education, and 90% of countries recorded teachers having trouble embracing digital learning programs from the natural way of teaching (UNESCO, 2020). The issues of teachers' lack of key skills and literacy in technology will possibly bring education quality into its lowest ebb (Nott, 2020). On the problems of teachers in the challenges of technology-driven instruction (Department of Education, 2020). Furthermore, in the local setting, the researcher has found out that the Electronic Self-Assessment Tool (e-SAT) result, 15 out of 28 or 54 % of teachers at School A-rated moderate under priority for development in promoting effective strategies in the positive use of ICT to facilitate teaching and learning process (Indicator 1.2). To bridge the gap of teachers from being moderate to proficient teachers of new normal modalities, the researcher conducted an intervention, Five-Step Technological process, to improve teachers' technological literacy in the learning delivery modalities.

In this context, the researcher wants to determine the improvement of the other hand, the most critical solution in improving teachers' technological literacy is to raise teachers' capacity in technology-driven instruction (Hasse, 2020).

As one of the ten significant contents for the learning continuity plan of the Department of Education is the readiness of teachers in continuing education amidst the pandemic, we need a concrete and comprehensive strategic plan to respond to teachers' technological literacy through a five-step technology-driven instruction strategy. This can be an effective tool in addressing problems of teachers in the new normal to improve and deliver quality education amidst the pandemic; thus, the researcher finds the urgency to conduct this study. The purpose of this study is to determine teachers' improvement on technological literacy through a five-step technology-driven instruction strategy.

This study sought to answer the questions namely:
1. What is the level of teachers' technological literacy before the implementation of the five-step technology-driven instruction strategy?
2. What is the level of teachers' technological literacy after the

implementation of the five-step technology-driven instruction strategy?

3. Is there a significant difference on the teachers' technological literacy before and after the implementation of five-step technology-driven instruction strategy?

METHODS

Research Design
In this study, the researcher utilized the action research quantitative method, administered pre-assessment and post-assessment. It employed a descriptive design to describe accurately, systematically, and answer the research questions of this study. The design helped the researcher gather significant data to gain understanding and knowledge on improving teachers' technological literacy before and after implementing a five-step technology-driven instruction strategy.

Participants of the Study
The participants of the study were 25 teachers using a purposive sampling method in identifying the appropriate respondents of the study (Dudovskiy, 2021). Only one group of participants underwent the five-step technology-driven instruction strategy. The respondents assessed teachers' technological literacy improvement before and after implementing a five-step technology-driven instruction strategy.

Data Gathering Methods
The researcher asked permission from the SDS and school head through a formal letter. After the approval proceeded to the conduct of the research by validation of the modified research instrument anchored from DepEd Order No. 35, s. 2016, after it reached the acceptable level of validation result, administration of pre-assessment to 25 teachers who were respondents of the study followed. The 25 respondents underwent the five-step technology-driven instruction strategy. Administration of post-assessment of teachers was done. After gathering all the information to determine the levels and significance difference of teachers'

technological literacy before and after implementing a five-step technology-driven instruction strategy, analysis and validation of the data using descriptive parameters for pre-assessment and post-assessment and post-assessment, and statistical tools.

Statistical Tools
The data collected were statistically treated and analyzed using Mean, Standard deviation, and t-test of significant difference.

Table 1
Descriptive Parameter Scale for Pre-Assessment Mean and Post-Assessment Mean

Mean Range	Description	Interpretation
4.20 – 5.00	Very High	This means that teachers' technological literacy is very much improved
3.40 – 4.19	High	This means that teachers' technological literacy is much improved
2.60 – 3.39	Average	This means that teachers' technological literacy is moderately improve
1.80 – 2.59	Low	This means that teachers' technological literacy is very less improved
1.00 – 1.79	Very Low	This means that teachers' technological literacy is least improved

Ethical Considerations

There were considerable ethical issues and concerns for the quantitative inquest of this study. The rights, confidentiality, and anonymity were considered in this study (Bryman & Bell, 2007).

The researcher observed and followed full ethical standards such as respect for persons, beneficence, and justice which the participants' benefits, safety, confidentiality, and privacy were prioritized (Ashworth et al., 2015).

RESULTS

Level of Teachers' Technological Literacy before the implementation of Five-Step Technology-Driven Instruction Strategy

Table 2 presents teachers' technological literacy level before implementing a five-step technology-driven instruction strategy. The five teachers' technology literacy indicators generated a general overall mean rating of 3.22 or *average.* This means that teachers' technological literacy was moderately improved before implementing the five-step technology-driven instruction strategy.

Table 2

Level of Teachers' Technological Literacy before the implementation of Five-Step Technology-driven Instruction Strategy

Indicator	Mean	SD	Descriptive Level
Entry	3.08	0.55	Average
Adoption	3.10	0.52	Average
Infusion	3.11	0.49	Average
Adaptation	3.19	0.50	Average
Transformation	3.312	0.54	Average
Category Mean	**3.22**	**0.46**	**Average**

Level of Teachers' Technological Literacy after the implementation of Five-Step Technology-Driven Instruction Strategy

Table 3 shows teachers' technology literacy level after implementing a five-step technology-driven instruction strategy as measured in five indicators: *entry, adoption, adaptation, infusion,* and *transformation.* The five indicators have obtained an overall mean rating of 4.12, described as high. This means that the level of teachers' technological literacy after implementing the five-step technology-driven instruction strategy was much improved.

Table 3

Level of Teachers' Technological Literacy after the Implementation of Five-Step Technology-Driven Instruction Strategy

Indicator	Mean	SD	Descriptive Level
Infusion	3.98	0.44	High
Entry	4.07	0.43	High
Adoption	4.08	0.53	High
Adaptation	4.17	0.55	High
Transformation	4.28	0.45	Very High
Category Mean	**4.12**	**0.57**	**High**

Significant Difference on Teachers' Technological Literacy before and after the implementation of Five-Step Technology-Driven Instruction Strategy

Table 4 shows the significant difference in teachers' technological literacy before and after implementing the five-step technology-driven instruction strategy. The results indicate that the pre-assessment has a mean and standard deviation of 3.22 and 0.46, respectively, while the post-assessment has a mean and standard deviation of 4.12 and 0.57, respectively. Since the computed p-value, 0.00, is less than 0.05 level of significance, the null hypothesis is rejected. This means a significant difference in the teachers'

technological literacy before and after implementing a five-step technology-driven instruction strategy.

Table 4

Significant Difference on the Teachers'
Technological Literacy before and after
the implementation of Five-Step
Technology-driven Instruction Strategy

Variable	Mean	SD	T value	p-value	Decision @ α = 0.05
Pre-assessment	3.22	.46			Ho is
			-13.10	0.000	Rejected
Post-assessment	4.12	0.57			

DISCUSSION

Level of Teachers' Technological Literacy before the Implementation of Five-Step Technology-Driven Instruction Strategy

Before implementing the five-step technology-driven instruction strategy, the teachers' technological literacy was moderately improved. This means that teachers have average technological knowledge and skills in integrating technology in the new normal learning modalities. The result agrees with UNESCO (2020) that despite the existing programs and resources given to all educators worldwide, teachers still have difficulties adopting technology-driven instructions and need confidence in handling and learning digital platforms. Over 68.8 million teachers globally and one million teachers in the Philippines extended personal time and resources to be competent and deserving in the new normal classroom setting.

Level of Teachers' Technological Literacy after the Implementation of Five-Step Technology-driven Instruction Strategy

After implementing the five-step technology-driven instruction strategy, the teachers' technological literacy improved.

This means that teachers' technological knowledge and skills have increased after implementing a five-step technology-driven instruction strategy. The result is supported by Toledo (2019) that the Five-Step of learning technology-driven instruction, technological literacy of teachers is developed. Teachers undergo the five stages of training to move from lower to higher levels of computer technology use and integration (p. 2).

It is also supported by Saxena and Saxena's (2020) research on the five stages of development in computer integration, which serves as the development of a framework or model to address teachers' needs in technology-driven instruction during the pandemic and emphasizes the increase of teaching levels for effective learning.

Significant Difference in the Teachers' Technological Literacy before and after the implementation of Five-Step Technology-Driven Instruction Strategy

There is a significant difference in teachers' technological literacy before and after implementing the five-step technology-driven instruction strategy. This means that the strategy, five-step technology-driven instruction, effectively improves the teachers' technological literacy. The finding is supported by Tuscaco's (2020) study that out of 100 teachers, 87 teachers have completed the last stage of the intervention on technological literacy and have increased their rank in the post-assessment activity (p.10). In addition, the result aligns with the study of Shank (2020) that 68 pre-school teachers integrated the five steps during the in-service training; the results of the u-test are 0.00 probability which means that the intervention is effective (p.10). Hence, the five-step technology-driven instructions strategy has an enormous impact on the teachers' technological literacy that brings the effectiveness of the teaching and learning process in the new normal setting of education.

Conclusion

Teachers adapting to the new normal learning modalities is quite challenging. Teachers' technological

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literacy was moderately improved before implementing the five-step technology-driven instruction strategy but greatly improved after implementing the five-step technology-driven instruction strategy. This means that a five-step technology-driven instruction strategy effectively improved teachers' technological literacy.

Reflection

The school and administration may investigate a long-term program or project like integrating technology in the curriculum and its pedagogies that will give opportunities for teachers to develop in making use of innovations and technological resources for improvement. The five-step technology-driven instruction strategy may serve as the intervention of teachers having difficulties in adapting to the new normal learning modalities. Further research may refer to this study as a reference in finding solutions to teachers' difficulties on technological literacy and serve as a basis to be competent in technology-driven instructional skills and improve learning outcomes. Thus, this will then serve as the basis for an intervention program for teachers.

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