



Technology and Livelihood Education (TLE) Teachers' Technology Proficiency and Instructional Module Writing Ability in the New Normal

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Authors' contributions

This work was carried out in collaboration between both authors. Author AEA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author MMB managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

This study aimed to determine the association between the technology proficiency and instructional module writing ability of TLE teachers as well as determining which of the indicators of the TLE teachers' technology proficiency significantly influence their instructional module writing ability during the new normal learning modality at Molopolo National High School, Davao del Sur. This study used the non-experimental quantitative research design utilizing the descriptive-correlational method. The questionnaire was validated, and a convenience sampling procedure was done. The 100 Technology and Livelihood Education (TLE) teachers from the Grades 7, 8, and 9 are the study's respondents. Findings of this study resulted that the TLE teachers manifest a strong technology proficiency in the new normal as well as the TLE teachers manifest a strong instructional module writing ability in the new normal. Correlational findings showed that there is a

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strong significant positive correlation between the technology proficiency and instructional module writing ability of TLE teachers in the new normal learning environment. Furthermore, the regression analysis resulted that all of the indicators of TLE teacher' technology proficiency significantly influenced their instructional module writing ability during the new normal learning modality.

Keywords: TLE teachers; technology proficiency; instructional modules writing ability; technology; livelihood education.

1. INTRODUCTION

The COVID-19 pandemic had a tremendous impact on students, teachers, and educational systems worldwide. Most governments around the world during the pandemic have temporarily closed educational institutions in an attempt to reduce the spread of COVID-19. With this, modular learning in a form of online and distance learning has become a critical lifeline for education. With this, teachers were forced to write and transform their learning process into modular learning modality. However, writing is seen as a difficult work by educators since it is a process that consist of many elements in a complex relation. Aside from that, teachers were not ready to the sudden shift of learning environment in the new normal wherein technology is seen to play a big part in the system. Since teachers were not ready for the situation, increasing their proficiency in dealing technological advancement in teaching as well as in writing modular learning materials became their dilemma during the new normal learning environment.

Within an international context, similar issues were also experienced by some institutions. According to research presented by Nemati [1] the writing ability of Iranian teachers falls short of expectations and requirements. It was the same with their estimation of their writing ability. The data also showed that most educators gave students misinformed feedback on their writing's foundational errors, failed to integrate technology into their writing lessons, and didn't encourage students to revise any drafts they were given feedback on. Biggs and Tang [2], pointed out that such instructional materials might be prohibitively long and fail to promote higher-order thinking (2019). Furthermore, teachers often lack the requisite abilities to utilize technology in education due to poor potentials for teacher training, as mentioned by Ghavifekr et.al (2011) and quoted by Tyler-Wood et.al [3]. The lack of qualified teachers is a critical issue throughout the education systems of countries on the

northern coast of South America, with particular focus on Guyana [4].

In the Philippines, some Filipino educators are wary of the modular method because they have only a limited understanding of and experience with information and communication technology [5]. This is due to a lack of proper education in Module Writing. In addition, the study "Implementation of Modular Approach in Teaching and Learning: Basis for Program Enhancement" found that in the formulations of modules and additional instructional resources in the modular advancement, teachers should think about contemporary norms to formulate, unify, transport, and measure resources for instruction and knowledge in order to keep up with technological development. It was stated that ten (10) primary schools in Buluan, Maguindanao, used modules with printed instructional materials [6]. As schools work to expand the curriculum, new and pressing challenges emerge. However, numerous obstacles exist, such as commerce with poor technical instruments Alvarez, [7] and the deterioration of the ability to discern sociocultural problems Karsenti & Collin [8], which may impede the adaption of technology.

According to Newsline Philippines (2020) in the local context, social media has been taken over by controversies about the published educational materials provided by the Department of Education. The frustrations of the students can be traced back to a broad variety of issues, ranging from straightforward typos to overly convoluted lesson plans. The administrator admitted that there were issues, but it promised to put forward and execute fixes as quickly as was practically possible.

The outcomes of the study indicate that there are considerable benefits for educators, most notably for the intermediate teachers who participated to the development of the modules. The findings of this study can be beneficial to educators if they are used to investigate the possibility of a causal relationship existing between their students'

levels of digital literacy and their students' abilities in the writing module. It is possible that future research may benefit from this study since it provides more elements that can be utilized to show readings.

2. METHODS

This study used descriptive correlational strategy for non-experimental quantitative research. The descriptive design explains the researched population, circumstance, or phenomena. Quantitative research employs a deductive-inductive technique, which means it departs from a theoretical framework, the idea of experts, and develops issues and their answers based on the researchers' experience and knowledge (Tanzeh, 2011). In particular, in assessing the degree and link between TLE Teachers' Technology Proficiency and Teachers Module Writing Ability (content and style) of the Grade 7, 8, and 9 TLE teachers in this new normal. This design is important to the research because it specifies the techniques and processes for gathering the necessary information, as well as the general operational pattern or framework of the project, which dictates what information is to be acquired from which sources using which methods (Nassaji, 2015). In addition, Grove, Burns, and Gray (2013) noted that descriptive quantitative design may be used to generate theory, uncover difficulties with present practice, defend current practice, make judgments, or determine what others in comparable circumstances are doing.

This research used adapted questionnaire it was used to measure the independent variable. With this, the first research questionnaire was adapted from the UNESCO ICT Competency (2011) the extent of TLE Teachers' Technology Proficiency (knowledge deepening, knowledge acquisition, and knowledge creation) of the Grade 7, 8, and 9 TLE. Second questionnaire was adapted from Wang et al., (2015) used to determine the extent of Teachers Module Writing Ability (content and style) of the Grade 7, 8, and 9 TLE teachers for the dependent variable of this study. Validity of the instrument will be assured by expert judgments and pilot testing of the instrument's dependability. In order to compute the value of Cronbach's Alpha, which is required to evaluate its reliability, pilot testing will be undertaken.

3. RESULTS AND DISCUSSION

The results of the extent of the TLE teachers' technology proficiency in the new normal was

shown in Table 1. This proficiency is usually defined for students and teachers to judge their level of expertise in a particular subject or class [9]. Based on the analysis, the overall mean level of the TLE teachers' technology proficiency in the new normal is 3.88, and the level of its equivalent descriptive intensity is high. This indicates that the TLE teachers manifest a strong technology proficiency in the new normal. This further means that TLE teachers were still proficient in their field of expertise even though several issues about the quality of education were raised due the effect of the COVID-19 pandemic. TLE teachers are still high proficient educational professionals who were independent in the application of skills vital to the teaching and learning process, who can still provide focused teaching programs that meet curriculum and assessment requirements, and who can display skills in planning, implementing and managing learning programs [10]. TLE teachers can still develop a safe, positive and productive learning environments where all students are encouraged to participate [11].

Table 1. Summary of the extent of TLE teachers' technology proficiency in the new normal

Indicators	Mean	Descriptive Level
Knowledge Deepening	3.87	High
Knowledge Acquisition	3.97	High
Knowledge Creation	3.81	High
Overall	3.88	High

In particular, the Knowledge Acquisition indicator is the one in technology proficiency of TLE teachers that has the greatest mean. There are three indicators in total. According to the findings of the data analysis, the computed mean score for the knowledge acquisition indicator is 3.97 with an equivalent descriptive level of high. This indicates that the TLE teachers manifest a strong knowledge acquisition proficiency in the new normal. TLE teachers can still identify knowledge from external sources and transformed this knowledge into useful outputs which can be used by the students [12]. For knowledge acquisition to become better, information presented by TLE teachers to the learners were useful to them in many ways possible (McNamara & O'Reilly, 2022). The result is in contrast to Arasio & Tancinco (2016) findings that TLE teachers have found it difficult to develop their knowledge acquisition skills due to the following factors such as lack of support from school administration and community, inadequate school facilities and

equipment, lack of instructional materials, and difficulties with dealing with students.

The indicator of Knowledge Deepening comes in at number two on the list of top indicators, with a mean score of 3.87 and an equivalent descriptive rating of high. This suggests that the Resilience indicator, which is the ability to enhance knowledge or structure of knowledge particularly the theories, principles, and concepts of a particular discipline [13], is strongly manifesting to TLE teachers in the new normal. TLE teachers are still able to manage information, structure problem tasks, and integrate technology and subject-specific applications with student-centered teaching methods and collaborative activities in support of students' in-depth understanding of key concepts and their application to complex, real-world problems [14].

The Knowledge Creation indicator has a mean score of 3.81 and an equivalent descriptive rating of high. It is the last indicator of TLE teachers' technology proficiency in the new normal. This indicates that the knowledge creation indicator, which is considers a continuous combination, transfer, and conversion of different kinds of knowledge or the formation of new notions and concepts which occurs through interactions between explicit and tacit knowledge in people's minds [15], is strongly manifesting to TLE teachers in the new normal. TLE teachers can still create new knowledge and acts as the heart of an organization's competitive advantage [16]. This is in line with Stan Garfield [17] ideas that knowledge creation can be linked to inventing and innovating new concepts, approaches, methods, techniques, products, services, and ideas which can be used for the benefit of people and organizations.

Based on the analysis presented in Table 2, the statement with highest mean is the "*I demonstrated in the class how sentences can be made simpler using the word processing application*". This statement obtains a mean score of 3.96 with an equivalent descriptive level of high. This implies that the said statement under the technology proficiency is strongly evident to TLE teachers in the new normal. The depth of teacher understanding directly relates to student learning. Teachers are better able to assess student understanding when they are more knowledgeable about the topics they are teaching (Prawat, 2012).

On the contrary, the statement that got the lowest mean of 3.82 is the "*I understood the*

basic principles of using ICT in teaching". Although it ranks as the lowest, it still described as high level. This implies that the said statement under the technology proficiency is strongly evident to TLE teachers in the new normal. Further, In the educational context, mastery of learning is crucial. This involves divisions of subject matter into units that have predetermined objectives or unit expectations (Intema et al., 2019).

Based on the analysis presented in Table 3, the statement with highest mean is the "*I used the ICT to focus on lessons/topics which I had not been able to make vivid and engaging before*". This statement obtains a mean score of 4.10 with an equivalent descriptive level of high. This implies that the said statement under the technology proficiency is strongly evident to TLE teachers in the new normal. The knowledge acquisition of teachers in the area of Technology and Livelihood Education has been found to be at the intermediate level in the fields of information and communication technology and entrepreneurship. This means that teachers are able to complete tasks related to ICT but may still need help and guidance from experts (Villegas, 2022). In general, Technology and Livelihood Education teachers can be classified as experienced in most competencies in the field of ICT and entrepreneurship, Agriculture, Home Economics, and Industrial Arts.

On the other hand, the statement that got the lowest mean of 3.84 is the "*I showed to my student's short videos or dramatic clips from films about my lesson for them to find it very interesting*". Although it ranks as the lowest, it still described as high level. This implies that the said statement under the technology proficiency is strongly evident to TLE teachers in the new normal. This is in line that teachers must utilized multimedia as an instructional material be utilized. Aside from that, adequate equipment and facilities should be procured, managerial and technical skills of Technology and Livelihood Education teachers be upgraded, and more institutional linkages with funding institutions should be created [18].

Based on the analysis on Table 4, the statement with highest mean is the "*I took a leading role in organizing an ICT based projects for students in collaboration with other subject teachers*". This statement obtains a mean score of 3.98 with an equivalent descriptive level of high. This implies that the said statement under the technology proficiency is strongly evident to TLE teachers in

the new normal. This is in line that creating new knowledge in endless combinations, transfer, and conversion of contrasting kinds of knowledge. It is a process of creating new knowledge and acts as the heart of an organization's competitive advantage [16]. In

addition, Stan Garfield [17], linked knowledge creation to inventing and innovating new concepts, approaches, methods, techniques, products, services, and ideas which can be used for the benefit of people and organizations.

Table 2. Extent of TLE teachers' technology proficiency in the new normal in terms of knowledge deepening

Knowledge Deepening Sub-Indicators	Mean	Descriptive Level
1. I understood the basic principles of using ICT in teaching.	3.82	High
2. I realized that using word processing would offer a new approach to one of the basic skills on the curriculum – how to improve the wording of sentences.	3.85	High
3. I demonstrated in the class how sentences can be made simpler using the word processing application.	3.96	High
4. I used word processing applications or PowerPoint presentation while conducting a discussion in my class.	3.90	High
5. I searched various websites to find teaching resources for my lessons.	3.84	High
Overall	3.87	High

Table 3. Extent of TLE teachers' technology proficiency in the new normal in terms of knowledge acquisition

Knowledge Acquisition Sub-Indicators	Mean	Descriptive Level
1. I thought I can use ICT to change attitude of my student and motivate them to learn better	3.94	High
2. I showed to my student's short videos or dramatic clips from films about my lesson for them to find it very interesting	3.84	High
3. I used video clips from the internet for my lessons	3.99	High
4. I used the ICT to focus on lessons/topics which I had not been able to make vivid and engaging before	4.10	High
5. I regularly visited an internet discussion or forum hosted by the professional association of teachers	3.96	High
Overall	3.97	High

Table 4. Extent of TLE teachers' technology proficiency in the new normal in terms of knowledge creation

Knowledge Creation Sub-Indicators	Mean	Descriptive Level
1. I took a leading role in organizing an ICT based projects for students in collaboration with other subject teachers	3.98	High
2. I made sure that ICT based projects for students organized covered different topics in different subjects.	3.64	High
3. I acted as monitor and coach to the pupils ensuring them to have skills and knowledge they need, methods they could use and remained focus on their task.	3.67	High
4. I created virtual learning environment using Google Classroom or other Social Media Platform which allowed students to store, share and develop their work collaboratively	3.84	High
5. I regularly showed to other teachers how I used ICT in designing my lessons	3.93	High
Overall	3.81	High

On the other hand, the statement that got the lowest mean of 3.64 is the “I made sure that ICT based projects for students organized covered different topics in different subjects”. Although it ranks as the lowest, it still described as high level. This implies that the said statement under the technology proficiency is strongly evident to TLE teachers in the new normal. Knowledge creation as an output refers to the development of new ideas that reflect a significant elaboration or enrichment of existing knowledge Mitchell & Boyle, [19], for example, Johnson [20] describes knowledge creation as the difference between what is known and what must be known for project success. As an output, knowledge creation is defined in terms of an immediate product of the knowledge creation process, such as the representation of an idea, and can be differentiated from its impact on the organizational system, or outcome. Knowledge creation as an outcome means that new knowledge is diffused, adopted and embedded as new products, services and systems [15].

Based on the analysis on Table 5, the results of the extent of the TLE teachers’ instructional module writing ability in the new normal in terms of content and style garnered an overall mean level of 3.93 with a high descriptive level equivalent. This indicates that the TLE teachers manifest a strong instructional module writing ability in the new normal. This further means that TLE teachers were still proficient in writing instructional materials such as instructional module even though several issues about the quality of education were raised due the effect of the COVID-19 pandemic. These instructional modules develop were relative and in support to the K to 12 curricula wherein the TLE integrate the mastery of knowledge and information, entrepreneurial concepts, work values, and skills for lifelong learning. DepEd adheres to the standards and principles of the K to 12 Basic Education Program (BEP) that empowers and allows schools, divisions, and regions to localize, indigenize and enhance the same based on their various instructional materials and social contexts [21].

Table 5. Extent of TLE teachers’ instructional module writing ability in the new normal

Indicators	Mean	Descriptive Level
Content	3.94	High
Style	3.87	High
Overall	3.93	High

In addition, quality of instructional modules was always given emphasis by TLE teachers which includes content such as lessons, exercises and activities, evaluations, and style such as formal, informal, or conversational [22]. This is in support to Koszalka et al [23] which notes that an instructional writer applies systematic methodology to design and develop content, experiences, and other solutions to support the acquisition of new knowledge or skills.

Based on the analysis as presented in Table 6, the overall p -value is equal to 0.000 with an r -value equal to 0.845. This means that there is a strong significant positive correlation between the technology proficiency and instructional module writing ability of TLE teachers in the new normal learning environment. Hence, this study rejects its set null hypothesis. Further, the analysis shows that an increasing manifestations of teachers’ technology proficiency leads to an increased instructional module writing ability of TLE teachers in the new normal learning environment.

Specifically, the analysis highlighted the relationship of between each indicator of TLE teachers’ technology proficiency and instructional module writing ability. As presented in the table, the Knowledge Acquisition indicator ranked as the top indicator of TLE teachers’ technology proficiency garnering a significant strong positive correlation with work commitment obtaining a p -value of 0.000 and r -value of 0.807. This was followed by the Knowledge Deepening indicator still garnering a significant strong positive correlation with work commitment obtaining a p -value of 0.000 and r -value of 0.778. Lastly, the Knowledge Creation indicator garnering a significant moderate positive correlation with work commitment obtaining a p -value of 0.000 and r -value of 0.607. Furthermore, all of the indicators of TLE teachers’ technology proficiency show positive direct relationship to their instructional module writing ability. This means that as the following indicators of technology proficiency were increasingly manifesting to the TLE teachers then their instructional module writing ability will also increase.

Consequently, technology proficiency is the ability to use technology to communicate effectively and professionally, organize information, produce high-quality products, and enhance thinking skills. In classroom settings, technology proficiency refers to the ability of teachers to integrate technology to teach and

facilitate, as well as to improve learning, productivity, and performance. These abilities are needed to participate in a technological world [24]. Technology proficiency enables teachers to identify and explore a wide variety of technological tools and devices in order to determine and select those that best respond to teaching and learning contents [25].

Based on the result presented on Table 7, the results of the overall study, the p-value was found to be equal to 0.000, and the F-value was found to be equal to 91.562, indicating that there is a significant influence of technology proficiency on the ability of TLE teachers to write instructional modules in the new normal. This also suggests that the regression model that was utilized in the analysis of the study is beneficial, and that there is merit to the interpretation that is based on the assumption of the aforementioned impact.

According to the regression analysis that was done on the data, every single one of the indicators of TLE teacher technological competency has a substantial effect on their capacity to write instructional modules in the new normal. In particular, the t-value for the indicator of *Knowledge Deepening* was found to be 4.306, while the p-value for this indicator was found to be 0.000. The t-value for the indicator of *Knowledge Acquisition* was found to be 5.893, while the p-value for this indicator was found to be 0.027. The t-value for the indicator of *Knowledge Creation* was found to be 2.030, while the p-value for this indicator was found to be 0.045. The predefined null hypothesis of this study stating that there are no indications of TLE teachers' technological competency that substantially impact their instructional module writing abilities in the new normal is rejected as a result of these findings.

Table 6. Significant relationship between technology proficiency and instructional module writing ability of TLE teachers in the new normal

Technology Proficiency	Instructional Module Writing Ability			
	r	p-value	Decision on H ₀	Interpretation
Knowledge Deepening	0.778	.000	Reject	There is a significant strong positive correlation
Knowledge Acquisition	0.807	.000	Reject	There is a significant strong positive correlation
Knowledge Creation	0.607	.000	Reject	There is a significant moderate positive correlation
Overall	0.845	.000	Reject	There is a significant strong positive correlation

Table 7. Regression analysis on the significant influence of technology proficiency on instructional module writing ability of TLE teachers in the new normal

Technology Proficiency	Instructional Module Writing Ability						Decision on H ₀	Interpretation
	Unstandardized Coefficients		Standardized Coefficients		Sig.	Beta		
	B	Std. Error	Beta	t				
(Constant)	0.202	0.232		0.868	.388			
Knowledge Deepening	0.372	0.086	.359	4.306	.000	Reject	Significant	
Knowledge Acquisition	0.449	0.076	.466	5.893	.000	Reject	Significant	
Knowledge Creation	0.132	0.065	.4135	2.030	.045	Reject	Significant	

$R = .861$; $R^2 = .741$; $F\text{-value} = 91.562$; $p\text{-value} = .000$

In a finding that should not be overlooked, the established outcomes of the regression analysis obtained an R^2 equal to 0.741. This indicates that 74.10% of the significance effect assigned to the importance of TLE teachers' technological competence that substantially influenced their instructional module writing abilities in the new normal is ascribed to the fact that there was a new normal. Therefore, the remaining 25.90% can be attributed to the many additional variables that were not included in the research. Specifically, these indicators might be added to determine if they might have stipulated effect on the instructional module writing skill of TLE teachers in the new normal learning set-up. This would be done by determining whether or not they are included in the current new normal set-up.

As a teacher in the 21st century, it is very necessary to include technology into the instructional plan for a number of different reasons [26]. Being more efficient typically results in more time being made available to teachers, which in turn opens up greater opportunities for invention, planning, conversation, critical thinking, and creative endeavors. Teachers who want to become more knowledgeable, acquire more information, and generate new knowledge may all benefit from the use of technology in their professional lives [24].

In addition, it seems that competence in using technology is crucial to many parts of the teaching profession, such as the production of instructional materials and the planning of lessons. Other factors that influence a teacher's decision to integrate technology into learning and teaching activities include the teacher's beliefs about the appropriate method for presenting the material, as well as the knowledge and abilities associated with the teacher's ability to effectively manage classroom activities while making use of various technological tools and devices [27]. Therefore, in order for teachers to be successful in their jobs and provide the desired results, they need to have the technological knowledge and abilities necessary for the duties and responsibilities of professional jobs.

4. CONCLUSION

The TLE teachers manifest a strong technology proficiency in the new normal. In addition, this demonstrates that TLE teachers continued to be competent in their field of expertise despite worries that were raised about the level of

instruction as a consequence of the COVID-19 outbreak. TLE teachers are still capable of building inclusive learning environments in which students from all walks of life are appreciated and encouraged to contribute. They are educated professionals who were formerly skilled in the independent application of skills that are essential to the process of teaching and learning, and they are able to demonstrate competence in the design, execution, and administration of learning programs. In addition, they are able to demonstrate competence in designing learning programs.

Accordingly, the TLE teachers manifest a strong instructional module writing ability in the new normal. It also implies that TLE teachers continued to demonstrate proficiency in developing instructional materials such as instructional modules despite there being concerns made regarding the quality of teaching as a result of the COVID-19 epidemic. Specifically, it implies that these concerns were a direct result of the epidemic. The instructional modules that were produced were supposed to be used as a supplement for the K-12 curriculum, which includes the TLE's integration of knowledge and information mastery, entrepreneurship, work values, and lifelong learning skills. Localization, indigenization, and enhancement of the same are encouraged and supported by DepEd in accordance with the standards and principles of the K-12 Basic Education Program (BEP). Schools, divisions, and regions are free to adapt localization, indigenization, and enhancement of the same to their own uniquely crafted instructional materials and social contexts.

Furthermore, there is a strong significant positive correlation between the technology proficiency and instructional module writing ability of TLE teachers in the new normal learning environment. This shows that in the new standard learning environment, TLE teachers are better equipped to produce instructional modules as a consequence of their enhanced manifestations of their technical expertise. This is because the new standard learning environment is based on blended learning. TLE teachers who have a background in technology-enhanced learning will be in a prime position to identify and experiment with a wide range of technological tools and devices in the context of the new normal learning environment. They will then choose those that provide the most effective responses to the materials that are being taught.

There is a significant influence of technology proficiency on the ability of TLE teachers to write instructional modules in the new normal. Specifically, every single one of the indicators of TLE teacher technological competency has a substantial effect on their capacity to write instructional modules in the new normal. When teachers have more time on their hands as a result of improvements in efficiency, there is typically an increased likelihood of increased opportunities for innovation, planning, dialogue, critical thinking, and creative thinking. This is because teachers have more time to devote to these activities when they have more time on their hands. The use of technology into educational environments can make it simpler for instructors to increase the breadth and depth of their own bodies of knowledge, learn new skills, and conceive of innovative teaching strategies. It would appear that having a fundamental knowledge of technology is required for many elements of teaching, such as the development of curricular plans and the fabrication of educational materials.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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