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Competence of Teachers in the Application of Information and Communication Technology (ICT) in Relation to their Performance

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Abstract:

The level of competence of teachers in the application of information and communication technology (ICT) in relation to them performance as basis for a capacity building plan. It made use of the Descriptive research design. One hundred twenty-five (125) teacher's in Manjuyod 2 District gave their consent to be the respondents and were able to answer the self-made questionnaire. Descriptive analytical and relational schemes were used to analyze the data collected. Frequency count and percentage as well as mean and T-test were utilized as statistical tools. Results revealed a high level of teacher's competence in the application of ICT in the areas of preparation of instructional materials and submission of report while it presented a moderate level in the areas of innovation and troubleshooting. There is no significant difference in the teacher's level of competence in the application of ICT when grouped and compared according to the variables age, civil status, number of ICT trainings and plantilla position. Similarly, there is no significant difference in the teacher's level of performance when grouped and compared according to the aforementioned areas. Finally, there is no significant relationship between the teacher's level of competence and their level of performance. Overall, the study showed that the level of teacher's competence does not affect their level of performance.

Keywords: communication technology, performance, significant,innovation,moderate,competence

Introduction:

Nature of the Problem

Information and Communication Technology (ICTs) are obviously of great significance for education (Ministry of Education Malaysia, 2016). The integration of ICTs in education in particular is the need of the hour. The enormous benefits of ICT have been well documented by various authorities and researchers.

The perceived usefulness of technology relates to the conviction among users such as teachers that it will make their work easier thus enhance job performance (Avci Yucel & Gulbahar, et al. 2017). Hence, if teachers think that the use of technology would make their day-to-day activities such as preparation of lesson plans, instructional materials, or analyses of student's results more organized and accurate; then they would probably use them. The perceived ease of use of new or existing technology would mean that the users view technology as one that does not require a lot of effort to learn how to use (Venkatesh, Thong, & Xu, et al. 2018).

Teachers are aware of the reasons for using ICT and its effect on both users and context, and have a critical and confident attitude to learning with the technology. Teachers' competencies are the confidence,
skill, and capability in using ICT for instruction purposes to perform the task appropriately. However, there are teachers who lack the confidence in using ICT. This may be caused by inadequate knowledge on ICT-related tasks and insufficient skills in using ICT software tools and the lack of reskilling and upskilling in the application of ICT. There are also teachers, especially the older ones, who would prefer the traditional way/manual scheme of teaching-related tasks.

It is in the light of the aforementioned concerns that the researcher is prompted to embark on this study which aims to determine the level of competence of teachers in the application of Information and Communication Technologies (ICT). Results of the investigation will be made basis for the crafting of a capacity building plan.

Current State of Knowledge

The research design to determine the level of competence in the application of Information and Communications Technology (ICT) of public elementary school teachers in relation to their performance as basis for capacity building plan.

According to McCombes (2019), descriptive research design is a purposive process of gathering, analyzing, classifying, and tabulating data about prevailing conditions, practices, beliefs, processes, trends and cause and effect relationship and then making adequate and accurate interpretation about such information with or without the help of statistical methods. It is a method that describes the characteristics of the population or phenomenon that is being studied, observing and measuring without manipulating the variables.

The nature of this study focuses on condition of things in their present state. It is concerned on situation currently existing which is competence of teachers in the application of ICT. Based on this premise, the researcher considered descriptive research design as the most appropriate method to use in this study.

Learning is valid and statistically sound which we are inclined to do, we see that within the top effects are formative evaluation, feedback, and teacher clarity. These have been shown to have a very strong influence on teachers' outcomes. Jang, Reeve, & Deci (2016), but others have looked at this as well feedback, formative evaluation, and clarity are measured in the scales looking at teacher structure, and demonstrated a positive relationship with student engagement. Add to this autonomy support to cover the affective/motivational aspects, and we have covered some aspects of the ideas that build positive teacher-student relationships, teacher listens to and accepts students' negative affect; provides students with choice; tries to build value and interest in the material.The technological ICT competencies that teachers need to develop, the highest performance that is the development of the competency to use

ICT skills in developing and presenting information presents technological key ICT skills in four main areas of knowledge namely: hardware, software, curriculum and general knowledge. These key ICT skills are not limited to knowledge of technical skills such as key boarding and technical use of some software packages. They include the ability to recognize when and how to apply ICT to the solution of problems.
The interplay of these variables is expected to create a school environment that would create opportunities for the teachers to improve their instructional competence in the application of ICT in relation to their performance and for the teachers to learn and grow individually and professionally.

Objectives of the Study

This study's goal was determined the competence of teachers in the application of ICTs of elementary school teachers in one of the districts of the Division of Negros Oriental for the school year 2021-2023.

Theoretical Underpinnings

This study is anchored on two theories: Technological Determinism proposed by Marshall Mcluhan (1962) and Expectancy motivation theory by Victor Vroom.Technological Determinism state that media technology shapes how individuals in a society think, feel, act, and how society operates as it moves from one technological age to another. Mcluhan said humans do not have much free will at all. Whatever society as a whole is using to communicate, they too will use to communicate. Therefore, they will adapt to the medium they are using so that they can send and receive messages like everyone else.The theory explains that when new systems of technology are developed, the culture or society is immediately changed to reflect the senses needed to use the new technology. It predicts that with every new system of media technology, society will change and adapt to that technology. This theory appropriately supports the present study which will determine the level of competence of teachers in the use of ICT in teaching and learning. According to Vroom's Expectancy Theory, the employee must believe the task is achievable, in order for them to put the effort into it. If the task is doable, the employee will be keen to perform well in anticipation of the bonus or Expectancy. This theory is about choice; it explains the processes that an individual undergoes to make choices. Motivation, according to Vroom, boils down to the decision of how much effort to apply in a specific task situation. This choice is based on a two-stage sequence of expectations: effort leads to performance and performance leads to a specific outcome/reward.
Vroom's theory appropriately provides anchor to this study particularly in the view that teachers behave according to their expectation. The teacher's effort lead to performance and performance lead to a specific outcome.

Methodology

This section discusses the research design, locale of the study, the respondents of the study, data gathering instrument, the validity and reliability of the instrument, data gathering procedure, analytical scheme, statistical tools, and the ethical considerations used in this study.

Research Design

This paper used the descriptive research design to this study utilized the descriptive research design to determine the level of competence in the application of Information and Communications Technology (ICT) of public

elementary school teachers in relation to their performance as basis for capacity building plan, which, aside from describing distribution and patterns, also compared groups and other study variables.

Respondents

The respondents of the study were 125 elementary teachers. Self-made instrument will be used to gather baseline data of the study which will be subjected to validity and reliability tests.

Data Collection

A self-made instrument was used to gather data of the study. The questionnaire consists of two (2) parts. Part 1 is on the respondents' profile such as age, sex , number of ICT-related trainings, and plantilla position. Part II contains items on the competence of teachers in the application of ICT in the area of innovation, preparation of instructional materials, submission of reports, and troubleshooting. Each area has 10 items for a total of 40 items, which were rated using following scale: (5) Always, (4) Often, (3) Sometimes, (2) Never and (1) Almost Never.

Data Analysis/Statistical Treatment

Objective 1 What is the profile of the respondents in terms of the following variables.Objective no. 2 What is the teacher's level of the competence in the application of ICT according to the following areas

Ethical Considerations

During this study, the researcher secured the respondents' informed consent and emphasized that their participation in this study would be voluntary, and they have the right to withdraw if they feel uncomfortable in gathering information from them. They were also assured of full confidentiality. No information that discloses their identity was released or published without their specific consent to the disclosure except when it is imperatively necessary.

Results and Discussions

This chapter presents the results of the study, their analyses and interpretations.

Table 1

Teacher's Level of the Competence in the Application of ICT in Relation to Their Performance in the Area of Innovation

Item	Mean	Interpretation
I am competent in applying ICT in…		
using a learning management system (e.g., Blackboard, Edmodo, Moodle) ..	3.53	High Level
creating project-based learning activities.	3.48	Moderate Level
capturing and editing digital photos, movies or other images	3.44	Moderate Level
producing and sharing learning materials online	3.52	High Level
providing digital feedback on the work of the learners	3.49	Moderate Level
creating and/or editing a questionnaire online	3.43	Moderate Level
using updated animation for my slide-deck presentations.	3.39	Moderate Level
creating posters and other visual displays in Word or Power Point	3.59	High level
contributing to a discussion forum/user group on the Internet	3.48	Moderate Level
assessing student learning through online tests	3.39	Moderate Level
Overall Mean	**3.47**	**Moderate Level**

Table 1 presents teacher's level of competence in the application of ICT in relation to their performance in the area of innovation obtaining an overall mean score of 3.47 interpreted or moderate level. Item No. 8 which is on creating posters and other visual displays in Word or Power Point obtained the highest mean score of 3.59, interpreted as high level. This implies that teachers are more knowledgeable in creating their lessons and discuss them effectively with the application of Word or power point, since they have been used to utilizing thes.

Meanwhile, Items No.7, using updated animation for my slide-deck presentations and No.10, assessing student learning through online tests got the same lowest mean scores of 3.39, interpreted as moderate level. This means that teachers are moderately competent in the assessment of student learning through online tests and in the utilization of animation for slide presentation. This implies that teachers are not knowledgeable enough in

creating their lessons and discuss them effectively with the application of Word or power point, since they have been used to utilizing these.

Ertmer & Otternbreit-Leftwich (2010) points out that evidence not enough good practice in the use of ICT is invariably found in those schools that also have high-quality ICT resources, and that a lack of computers and software can seriously limit what teachers can do in the classroom with regard to the implementation of ICT. Innovation is essential in integrating technology in education for it can transform the way people think, work, and live (Mas Nida et al., 2011).

Table 2

Teacher's Level of the Competence in the Application of ICT in Relation to Their Performance in the Area of Preparation of Instructional Materials

Item	**Mean**	**Interpretation**
I am competent in applying ICT in… using music/videos as springboard of my lesson	3.58	High Level
adding images, animations, transition, sound and video in presentation of lessons	3.58	High Level
finding useful teaching resources on the Internet	3.83	High Level
making a video/cartoon for use as a teaching aid	3.45	Moderate Level
utilizing digital learning games appropriate to my lessons.	3.46	Moderate Level
improving the quality of my teaching materials	3.55	High Level
preparing varied and engaging learning activities	3.62	High Level
creating a new or editing any existing slide show for teaching	3.57	High Level
utilizing graphing or drawing software to enhance illustration in the learning materials	3.38	Moderate Level
downloading or uploading curriculum resources from/to websites or learning platforms for students to use	3.62	High Level
Overall Mean	**3.56**	**High Level**

Table 2 shows teacher's level of the competence in the application of ICT in relation to their performance in terms of preparation of instructional materials with an overall mean score of 3.56, interpreted as high level. Item No. 3 which is on finding useful teaching resources on the Internet obtained the highest mean score of 3.83 interpreted as high level.

This shows that teachers are capable of locating teaching resources in the internet. While the lowest mean score of 3.38 interpreted as moderate level was on item No. 9 on utilizing graphing or drawing software to enhance illustration in the learning materials. The result implies that the teachers are not highly skillful in preparing visual aids in teaching with the aid of technology. Furthermore, the result indicates that teachers are still dependent on expert in using graphing and drawing software that are very useful in making presentable illustrations in learning materials.

This result find meaning in the findings of Spears (2012) who showed not skillful enough that ICT can be a driving force for education innovation through the improvement of instructional material quality, the development of high-quality assessments that indicate student learning, and the increased use of data to provide rich feedback to both students and teachers. This may cover such utilization of software to enhance the quality of a learning material.

Table 3

Teacher's Level of the Competence in the Application of ICT in Relation to Their Performance in the Area of Submission of Report

Item	Mean	Interpretation
I am competent in applying ICT in… sending my report via email.	3.62	High Level
organizing computer files in folders and subfolders	3.74	High Level
providing assistance to teachers to enhance their skills in submitting online reports	3.44	Moderate Level
uploading accomplished reports through Google links	3.45	Moderate Level
organizing reports using Excel template/ spreadsheets.	3.56	High Level
delivering reports orally with PowerPoint presentation.	3.56	High Level
designing and producing digital learning resources online.	3.62	High Level
using Google forms in collecting/ consolidating data for reports.	3.40	Moderate Level

selecting best strategies in submitting reports promptly.	3.50	High Level
communicating with co-teachers in submitting of reports online.	3.62	High Level
Overall Mean	3.55	High Level

Table 3 presents teacher's level of the competence in the application of ICT in relation to their performance in the area of submission of report obtaining an overall mean score of 3.55 interpreted as high level. The highest mean score of 3.74 interpreted also as high level was on item No. 2 on organizing computer files in folders and subfolders. Whereas, the lowest mean score of 3.40, interpreted as moderate level was obtained by item No. 8 on using Google forms in collecting/consolidating data for report.

This implies that in terms of organizing computer files, teachers are not highly competent because this is considered a basic skill that every teacher must possess in this era where modern technology is a must in their job. Using google forms is manifest of skill in organizing such that items and results are easily recognizable.

Table 4

Teacher's Level of the Competence in the Application of ICT in Relation to Their Performance in the Area of Troubleshooting

Item	Mean	Interpretation
I am competent in applying ICT in…		
checking all the internal cooling systems of the computer.	3.24	Moderate Level
determining if the problem with the computer is software- or hardware-related.	3.21	Moderate Level
checking connection of mouse pointer when moving intermittently on the screen.	3.43	Moderate Level
determining the cause of the garbling of file names and folder names	3.17	Moderate Level
fixing the keyboard of the computer	3.13	Moderate Level
fixing a windows-start up problem.	3.04	Moderate Level
downloading and installing software on a computer	3.34	Moderate Level
checking why printing is distorted.	3.35	Moderate Level
clearing the feeding elements for paper jam problems	3.44	Moderate Level
putting off and unplugging printers during sudden malfunction	3.59	High Level
Overall Mean	3.29	Moderate Level

Table 4 presents the level of teachers' competence in the application of ICT in relation to their performance in the area of troubleshooting with an overall mean score of 3.29 interpreted as moderate level.

The highest mean score of 3.59 interpreted as high level is obtained by item No. 10, which states putting off and unplugging printers during sudden malfunction.
The lowest mean score of 3.04 interpreted as moderate level is on item no. 6 on fixing a windows-start up problem.

This implies that the teachers would likely need more knowledge to acquire the technical skill on how to deal problems on Windows start-up failure. It further implies that the teachers have already encountered such difficulties and have mastered the skills in troubleshooting such case. There also online instructions than can be followed through YouTube. The result shows that most of the respondents have basic but not thorough knowledge in fixing simple malfunctions of the computer like checking connection of mouse pointer when moving intermittently on the screen of the computer.

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Table 5

Difference in the Teacher's Level of competence in the application of ICT in the area of Innovation When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean Rank	Mann Whitney U	*p*-value	*Sig. level*	Interpretation
Age	Younger	63	68.25	1622.50	0.102	0.05	Not Significant
	Older	62	57.67				
Civil Status	Single	34	67.10	1407.50	0.438		Not Significant
	Married	91	61.47				
Number of ICT-Related Trainings	Few	76	60.89	1701.50	0.416		Not Significant
	Many	49	66.28				
Plantilla Position	Lower	74	67.57	1548.50	0.089		Not Significant
	Higher	51	56.36				

Table 5 shows the *p*-value in determining the significance in the differences between levels of competence among respondents compared according to aforementioned variables.

There is no significant difference in the teacher's level of competence in the application of ICT in the area of innovation when respondents are grouped and compared according to the aforementioned variables. The computed values of 0.102, 0.438, 0.416 and 0.089 are greater than the 0.05 level of significance. Thus, the hypothesis stating that there is no significant difference in the level of teacher's competence in the application of ICT in the area of innovation when grouped and compared according to the aforementioned variables is accepted.

This would imply that the aforementioned variables do not make a difference in the teacher's level of competence in the application of ICT in the area of innovation. The finding that differences are not significant implies that personal circumstances as well as the respondents' level of competence does not have any significant influence with each other.

This result finds meaning in the study of Buliva, (2018) that showed that regardless of age, all teachers have indicated that innovation is important in the field of teaching. Also, remaining married or unmarried does not affect the professional adjustment of teachers as to the innovation of technologies (Rizvi, 2016).

Table 6

Difference in the Teacher's level of competence in the application of ICT in the area of Preparation of Instructional Materials When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean Rank	Mann Whitney U	*p*-value	*Sig. level*	Interpretation
Age	Younger	63	67.37	1678.00	0.174	0.05	Not Significant
	Older	62	58.56				
Civil Status	Single	34	65.47	1463.00	0.641		Not Significant
	Married	91	62.08				
Number of ICT-Related Trainings	Few	76	60.89	1701.50	0.416		Not Significant
	Many	49	66.28				
Plantilla Position	Lower	74	67.32	1567.50	0.108		Not Significant
	Higher	51	56.74				

Table 6 likewise reveals no significant difference in the teacher's level of competence in the application of ICT in the area of preparation of Instructional materials when grouped and compared according to the

aforementioned variables. The computed values of 0.174, 0.641, 0.416 and 0.108 are greater than the 0.05 level of significance. Thus, the hypothesis stating that there is no significant difference in the level of teacher's competence in the application of ICT in the area of preparation of instructional materials when grouped and compared according to the aforementioned variables is accepted.

This result would mean that the aforementioned variables did not significantly influence the teacher's level of competence in the application of ICT in the preparation of their instructional materials. As shown in the teachers' performance rating, the use of ICT could have influenced their performance, particularly in the delivery of their teaching performance that includes not only learning activities in the classroom but also include their reportorial requirements.

Oko and Uwatt (2015) found an enhancement of teachers' performance in lesson preparation and delivery through the use of Information and Communication Technology in Ogoja education Zone.

Conclusion

The following conclusions are drawn based on the summary of findings:

In the application of information and communication technology, this study attempted to determine the level of teacher's competence in the areas of innovation, preparation of instructional materials, submission of report and troubleshooting.

It can be implied the younger, the single and the lower categories, respectively obtained a high level of competence while the older, the married and the higher categories got an average level. The single group also gained a high level of competence in the area of troubleshooting, whereas the married group obtained an average level. In addition, in the area of innovation, the issues of concern are in the use of updated animation for slide presentation and the assessment of student learning thru online test. With the average rating of these issues, it can be concluded that competence of teachers in the application of information and communications technologies in this area has not reached its maximum potential level. While in the area of preparation of instructional materials, an average level of competence is also given to the issue of utilizing the graphing or drawing software in the enhancement of illustration of learning materials.

Through this finding, it can be concluded that this ICT tool is not frequently used by teachers in the formulation of their learning materials. Then in the area of submission of report, the concern regarding the use of google forms in collecting/consolidating data for reports also obtained an average level of competence. This result brings about the conclusion that teachers may have a hard time using google forms in collecting data for their reports.

Finally, the area of troubleshooting obtained an average level of competence, more so in the issue of fixing a window-start up problem. With this finding, it can be assumed that teachers only have satisfactory troubleshooting skills.

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