EXAMINING THE RELATIONSHIP BETWEEN PERCEIVED EASE OF USE, PERCEIVED USEFULNESS, AND BEHAVIORAL INTENTION IN INTEGRATING ICT IN TEACHING AND LEARNING TECHNOLOGY & LIVELIHOOD EDUCATION

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ABSTRACT. *This study examines the relationships between the perceived Ease of Use, Usefulness, and Behavioral Intentions among TLE teachers in utilizing Information and Communication Technology ICT tools in teaching. Grounded in Venkatesh & Davis's Technology Acceptance Model 2, which stems from Ajzen & Fishbein's Theory of Reasoned Action, the research adopts a descriptive-correlational approach with purposive random sampling to survey 133 participants. Findings indicate a moderate overall attitude towards ICT integration among TLE teachers, with 'perceived usefulness' scoring highest and 'perceived ease of use' and 'behavioral intention' scoring lowest. Moreover, it was found that a strong positive correlation was observed between perceived ease of use and perceived usefulness ($r= .817$, $p<0.01$), implying that improvements in ease of use significantly contribute to the perceived usefulness of ICT tools among technology education teachers. This suggests that while Technology and Livelihood Education TLE teachers are adopting ICT concepts and strategies, there is room for improvement in their application for student benefit. The study recommends enhancing teachers' attitudes as key predictors of ICT integration in education. It emphasizes the importance of prioritizing seminars and training to bolster ICT empowerment, and enriching student learning experiences.*

Keywords: behavioral intention, ease of use, ICT integration, perceived usefulness, technology and livelihood education

1. INTRODUCTION

Using technology is a tool and a catalyst for change [1]. New technologies have become central to the lives of every individual in this world. Almost everything that we do in the modern world is influenced by new technologies. In education, technology plays numerous roles in the job of teachers. As an educational tool, technology has opened wider avenues for managing resources and teaching and learning processes. Information and Communication Technology ICT tools can be effective for learning and support teachers in delivering and testing content. Technology has been a game changer in education since it addresses literacy gaps among teachers and learners and becomes an essential step in improving the quality of teaching and learning. A new educational revolution in teaching and learning has been triggered by technology and has resulted in better learning outcomes in the 21st century [2] Relative to this, the Department of Education in the Philippines issued DepEd Order No.42, s.2017, mandating the use of the Philippine Professional Standard for Teachers (PPST) that is responsible for implementing one of the stipulated required competencies that the teachers show skills in the positive use of ICT to facilitate teaching and learning and show skills in the selection, development, and use of the variety of teaching and learning resources including ICT to address its learning goals [3].To cope with the current trend, initiatives made by the Department of Education include providing various ICT training for the teachers, implementation of the DepEd Computerization Program, Project Be Techie in School 2.0, ICT courses under Information and Communications Technology Service (ICTS), linking DepEd with the Department of Information and Communications Technology (DICT), and DepEd Digital Education 2028 which primary aim is to promote ICT literacy for both teachers and learners. However, the initiative provided by the department is not enough for the public school teachers to meet the Philippine ICT competency standard due to a lack of sufficient knowledge and skills to use technological tools, which indicates that the training design provided for teachers is ineffective. According to the study conducted by Balansag [4] not all teachers are reached by this program through training, and some teachers are not flexible to a modernized approach to teaching. Therefore, effective ongoing professional development must be implemented so teachers can use ICT tools.

The research conducted by Ngao *et al*. [5] revealed that some teachers did not understand the logic behind using technology and questioned the rationale for applying it to their teaching. This issue mirrors the situation teachers face in the DepEd-Division of Cagayan de Oro City, Philippines, where the teachers' proficiency in ICT does not align with the identified areas of development deemed essential. This discrepancy highlights a gap in the actual ICT competencies of teachers despite various ICT training programs and workshops organized by the Department of Education.

The study by Ghavifekr *et al.* [6] emphasized the critical role of teachers' attitudes in successfully integrating ICT tools in the classroom. Several factors were identified as significant barriers to teachers' effective use of ICT: lack of ICT knowledge and awareness, insufficient practical training, limited technical support in schools, scarcity of ICT resources, inadequate professional development opportunities, varying educational qualifications, and accessibility to computer laboratories. These obstacles are interconnected and observable in various public schools across the Philippines.

The identified teacher-respondents by the researchers were public secondary teachers with Technology and Livelihood Education specialization. They were selected to participate in this study because they have slim opportunities to attend professional development training compared to the different subject specializations. Not all of them could join the training

due to the limited number of participants. Some teachers responded that professional development in ICT integration had not given them the sufficient knowledge and skills they needed in the educational arena. Teacher training in ICT needs immediate attention to increase teachers' competencies and confidence in integrating technologies into their mainstream teaching to build on professional experience [7].

On the other hand, there are a lot of TLE teachers teaching in public schools who are still stuck with the traditional way of teaching and lack confidence in infusing technology in class. As Alsubaie [8] mentioned in his research study, the teachers' teaching style should be updated for better program implementation and to generate great difference in the learning environment. Technology and Livelihood Education teachers in the Philippines faced a lot of challenges. It is necessary to address these problems to ensure the teaching and learning experience in TLE subjects in the Philippines. In the study conducted by Barcelona et al. [9] TLE teachers face difficulties in delivering effective instruction and engaging students in the learning process due to pedagogical issues, lack of material resources, and technological challenges.

Furthermore, this research study generates information on assessing TLE teachers' attitudes that can be used for training implementations and capacity-building recommendations. The researchers explored teachers' actual level of ICT competence towards ICT integration in public secondary schools in the Department of Education – Division of Cagayan de Oro City using variables that have influenced or prompted the actual ICT integration. The result is only to be used as a reference for designing a training that will be fitted based on the results of your study. Moreover, ICT training for public school teachers is vital in enhancing teaching practices, improving student outcomes, and fostering a technologically proficient educational environment.

Research Questions

This study seeks to answer the following questions:

1. What is the level of perceived ease of use, usefulness, and behavioral intention in ICT integration among the technology education teachers in DepEd, Division of Cagayan de Oro City?
2. Is there a significant relationship between perceived ease of use, perceived usefulness, and behavioral intention of ICT among the Technology and Livelihood Education teachers in DepEd, Division of Cagayan de Oro City?

2. METHODOLOGY

This research study focuses on determining the public secondary school teachers' attitudes toward ICT integration in teaching and learning Technology and Livelihood Education and utilizing the result to develop training interventions for in-service teachers.

2.1 Research Design

This study used a descriptive research design describing the population's characteristics or phenomenon being studied [10]. The descriptive research design is concerned with conditions or relationships that exist, opinions that are held, processes that are going on, and evident effects or trends that are developing. This research design is more appropriate since the aim of this research is to identify characteristics, frequencies, trends, and categories [11].

This study's descriptive research design identifies the respondents' characteristics and compares and contrasts teachers' attitudes toward ICT integration in teaching and learning TLE. This study describes respondents' attitudes in ICT integration towards the teaching and learning process, offering exceptional insights that can be used as input for training program recommendations for in-service TLE teachers.

2.2 Data Gathering

The initial step involved collecting quantitative data to support the objective of this research study. The data was obtained using a using a survey questionnaire. The researchers adapted and developed a survey questionnaire. In developing the survey questionnaire, the researchers reviewed relevant literature that cites numerous instruments already used in educational settings. They were collecting data involving multiple stages, presented in Table 1, which outlined the tasks to be completed at each phase of the study.

Table 1. Data Collection Procedure

Activities	Data Collection
Obtain permissions	Schools Division Superintendent School District Supervisor Educational Program Specialist – TLE School Principal
Answering the Online Survey	Send through messenger the link to the online survey
Analyse and Interpretations of Data	Analyses and Interpretation of Data using SPSS

2.3 Respondents

The participants of this research study are public secondary teachers with Technology and Livelihood Education specialization from DepEd-Division of Cagayan de Oro City, Philippines. The research study employed a purposive sampling method. This method is appropriate when the researcher has a clear idea of the characteristics or attributes they are interested in and wants to select a sample representative of those characteristics [12]. The researchers identified two hundred (200) respondents; however, one hundred thirty-three respondents voluntarily participated in the study. To validate the appropriateness of the number of respondents Krejcie and Morgan's table was used to guide the researchers with confidence about the sample size, and at the same time, it provides higher accuracy compared to other approaches [13]. In addition, the researchers gathered the necessary data to describe the characteristics of the population and draw accurate conclusions. On the other hand, for the inclusion and exclusion criteria used to participate in this research study the following were observed: Inclusion Criteria (1) Must be a secondary public-school teacher with TLE specialization (2) Must be from DepEd – Division of Cagayan de Oro City (3) Approval of the consent letter is required to respond the questionnaire and for the Exclusion Criteria (1) A public secondary teacher who is not a TLE major (2) A public secondary school teacher from other division (3) The consent letter to respond to questionnaire was disregarded, declined, or refused.

Moreover, the researchers secured confidentiality and consent from the respondents. The protection of the integrity of participants and informants is considered an important ethical norm in research. This norm focuses on protection against various forms of risk involved in participation in research and the protection of the identity of participants, including concerns for preventing stigmatization of particular populations or groups [14].

2.4 Research Instrument

The research instrument used in this study was constructed in two parts. The first part focuses on the respondents' demographic characteristics, and the second part of the research instrument is a set of questions that assess the respondents' attitudes. The researchers adapted and modified the survey questionnaire checklist on perceived usefulness and ease of use of Ghavifekr, S. & Rody, W.A.W [15] to suit the study. On the other hand, the researchers also modified the intention to integrate the ICT tool from Agrupamento de Escolas de Atouguia da Baleia -Portugal through digitalclass.com (2016). Also, the researchers used the Five-level Likert scale, which offers different options for the participants. This scale can measure agreement, likelihood, frequency, importance, quality, and more [16].

Table 2 presents the scoring guideline as to how the researchers assigned a numerical value using a rating scale with a description.

Table 2. Scoring Guideline

Scale	Range	Description	Interpretation
5	4.51-5.00	Strongly Agree	Very High Positive
4	3.26-4.50	Agree	Highly Positive
3	2.51-3.25	Undecided	Neutral
2	1.76-2.50	Disagree	Negative
1	1.00-1.75	Strongly Disagree	Very Negative

2.5 Validity and Reliability

In assessing the instrument's validity, the researchers examined relevant literature and sought input from an expert in research, ICT, and an educational program specialist in TLE to review the content. In terms of the instrument's reliability, Cronbach's Alpha was employed for evaluation. The results revealed a Cronbach's Alpha value of each contact was highly acceptable, indicating high reliability and affirming the trustworthiness of the instrument utilized in the study.

3. RESULTS AND DISCUSSION

The Perceived Ease of Use of ICT in Teaching & Learning

Mean and standard deviation were used to examine the perceived ease of use of ICT in teaching and learning Technology and Livelihood Education. Perceived ease of use indicates the extent to which individuals perceive that utilizing a specific system would entail minimal effort. Table 4 below presents the result of respondents' level of perceived ease of use of ICT in teaching and learning TLE.

Table 4 indicates teachers' attitudes towards ICT integration in teaching for student learning in terms of Perceived ease of use. It registered an overall mean of 4.28 and *SD*=0.53 which most of the respondents agreed. This data implies that the teachers observed that using ICT allows the students to become more interested and attentive to the teaching and learning activities. It has been proven that integrating ICT into the classroom increases student motivation, enthusiasm, and engagement in their learning subjects. ICTs make more engaged student interaction and simultaneous access to technological information [17].

Table 4. Perceived Ease of Use of ICT in Teaching & Learning

Indicators	Mean	SD	Description
1. ICT allows students to be more creative and imaginative	4.23	0.55	Agree
2. The use of ICT helps students to find related knowledge and information for TLE learning.	4.21	0.56	Agree
3. The use of ICT encourages students to collaborate and communicate more with their classmates.	4.41	0.51	Agree
4. The use of ICT increases students' engagement and participation in the class.	4.32	0.52	Agree
5. I think students learn more effectively using technology tools.	4.28	0.54	Agree
6. I think using ICT helps improve students' skills, specifically in understanding TLE competencies.	4.29	0.53	Agree
7. The students are more responsive and behave using ICT.	4.24	0.55	Agree
8. The use of ICT enables students to express their ideas and thoughts better in understanding TLE concepts.	4.29	0.53	Agree
Overall	**4.28**	**0.53**	**Agree**

Galaraga and Alpuerto (2022) [18] stated that teachers have difficulties integrating ICT tools as they sometimes have challenging features. Still, they are determined to learn and master for the sake of the students, knowing that it impacts their interest and high performance. Resilient teachers will continue to do their best so that their students can learn in the best way possible.

In the same table, indicator number 3: *The use of ICT encourages students to collaborate and communicate more with their classmates*, rated as the highest with a mean score of 4.41 and SD=0.51, with the description of Moderate Level. This data implies that the teachers observed that the students become more engrossed in the learning and learning activities and processes if the teachers utilized the integration of ICT strategies and concepts. Most students utilize mobile phones, computers, the internet/modem, digital cameras, or printers outside of school, according to a study by Mensah *et al.* [19]. Again, the results demonstrated that ICT has enhanced students' academic performance. In addition, the results showed that students encounter obstacles when attempting to utilize ICT resources for educational purposes due to restricted internet connectivity and specific instructors' stance regarding ICT integration in the classroom.

Meanwhile, indicator number 2: *The use of ICT helps students to find related knowledge and information for TLE learning*, which was rated the lowest with a mean score of 4.21 and SD=0.56, with the description of Moderate Level.

This data implies that the teachers observe that they need to help and assist the students in navigating the advantages of the advancement of ICT as they can find various sources and references for their better understanding and further studies.

Therefore, by enabling students to communicate with one another virtually and utilizing various technologies to capture, transmit, collect, analyze, store, and distribute the information required to complete a specific task more quickly [20].

The Perceived Usefulness of ICT in Teaching & Learning

Mean and standard deviation were used to perform the perceived usefulness of ICT in teaching and learning Technology and Livelihood Education. Perceive usefulness signifies the extent to which individuals perceive that utilizing a specific technology would improve their work effectiveness.

Table 5 below presents the result of respondents' level of perceived usefulness of ICT in teaching and learning TLE. Perceived usefulness registered an overall mean of 4.30 with *SD*=0.54, which most of the respondents agreed. This data implies that the teachers have realized the importance of integrating ICT-related concepts and strategies in the teaching and learning process related to the subject TLE.

According to Alpuerto [21] the teachers are also adjusting to teach the students the best way possible through integrating ICT tools. What drives them to do such actions are their thoughts and hopes that these students will have enough preparation as well as enough acquisition of knowledge and skills that they can use in their future endeavors. In the same table, indicator number 3: *I think that ICT enhances learner-centered learning* was rated the highest with a mean score of 4.45 and *SD*=0.51 with the description of Moderate Level. This data implies that the teachers recognize the importance of integrating ICT into student learning. To do this, teachers need to upskill and abreast themselves with various ICT-related concepts, strategies, and skills to enable them to make activities and tasks that integrate the technologies.

Table 5. Perceived Usefulness of ICT in Teaching & Learning

Indicators	Mean	SD	Description
1. I feel confident acquiring new technology skills.	4.33	0.53	Agree
2. I find using ICT in teaching TLE classes more convenient.	4.22	0.56	Agree
3. I think that ICT enhances learner-centered learning.	4.45	0.51	Agree
4. I think that teaching using ICT can make TLE learning more engaging and effective.	4.23	0.56	Agree
5. I think using ICT tools helps teachers to improve teaching with more updated materials.	4.35	0.53	Agree
6. I think using ICT helps TLE teachers prepare efficient teaching resources and materials.	4.26	0.55	Agree
7. I have more time to address the student's needs if ICT is used in teaching.	4.30	0.54	Agree
8. I am certain that my students learn best without the aid of ICT.	4.29	0.54	Agree
Overall	**4.30**	**0.54**	**Agree**

Meanwhile, indicator number 2, *which I find more convenient to use ICT in teaching TLE class, was rated the lowest with a mean score of 4.22 and SD=0.56,* with the description of Moderate Level. This implies that teachers sometimes have difficulty using ICT-related gadgets or strategies in their teaching and learning activities. This only means that the teachers need assistance in learning and mastering the utilization of gadgets and even ICT-based strategies. In the study by Akram et al. [22], teachers exhibit positive perceptions regarding technology integration in teaching-learning practices. They believe that technology-incorporated teaching assists them in enhancing their instructional practices effectively, making the learning process exciting and interactive, and keeping learners motivated.

The Behavioral Intention to Integrate ICT in Teaching & Learning

Mean and standard deviation were used to perform the behavioral intention to integrate ICT in teaching and learning Technology and Livelihood Education. Behavioral intention pertains to the extent to which the teacher has developed deliberate intentions to engage in or abstain from certain defined future actions.

Table 6 below, showcases teachers' attitudes towards ICT integration in teaching for student learning in terms of behavioral intention to integrate IC. It registered an overall mean of 4.28 and *SD*= 0.53 which majority of the respondents agreed. This data implies that the teachers have good behavioral intentions of integrating ICT tools into the teaching and learning process.

Adelakun and Omolola [23]stated that the teachers' intentions to fully integrate ICT tools and strategies in their teaching and learning sessions with their students were always at a high level. They are hampered by factors or challenges beyond their control, making them feel discouraged sometimes. Still, their passion and commitment to their teaching profession are high, making them decide to continue their plan of action to let the students learn and realize that there are many ways and means to learn and perform better.

Table 6. The Behavioral Intention to Integrate ICT in Teaching and Learning TLE

Indicators	Mean	SD	Description
1. I intend to prepare exercises, homework, and student tasks using web 2.0 tool applications like (Kahoot, Google Forms, Padlet, Mentimeter, Moodle, ePortfolio, etc.).	4.24	0.56	Agree
2. I intend to use email and other social networking platforms (Messenger, Facebook, Instagram, etc.) to provide feedback and/or assess students' learning in my TLE subject.	4.35	0.51	Agree
3. I intend to use social networking platforms to communicate online with parents regarding the student's performance.	4.34	0.52	Agree
4. I intend to download or upload curriculum resources from/to websites or learning platforms for students.	4.27	0.55	Agree

5. I intend to browse the internet to collect resources to collect video clips, modules, TLE related articles to be used during my lesson.	4.38	0.53	Agree
6. I intend to allow my students to use smartphones, laptops, and other digital learning resources to accomplish performance activities.	4.42	0.54	Agree
7. I intend to allow my students to create a presentation with simple animations.	4.15	0.58	Agree
8. I intend to allow my students to browse the internet using different electronic devices to collect information.	4.29	0.55	Agree
9. I intend to use online and offline software applications (PowerPoint, Prezi, Canva, Google Presentation, etc.) to prepare presentations for my TLE lessons.	4.26	0.53	Agree
10. I intend to create technology-based instructional learning materials for my students using available electronic devices.	4.29	0.51	Agree
11. I intend to produce a text using a word processing program as my supplementary learning material.	4.22	0.54	Agree
12. I intend to evaluate digital learning resources on the TLE subject taught and utilize available enabling technologies.	4.20	0.53	Agree
Overall	**4.28**	**0.54**	**Agree**

In the same table, indicator number 6: *I intend to allow my students to use smartphones, laptops, and other digital learning resources in accomplishing performance activities*, was rated the highest with a mean score of 4.42 and *SD*= 0.54 with the description of Moderate Level. This data implies that the teachers have plans and ideas for letting their students use gadgets during the teaching and learning process and activities.

Meanwhile, indicator number 6: *I intend to allow my students to create a presentation with simple animations* with a mean score of 4.15 and *SD*=0.58 with the description of Moderate Level. This implies that the teachers plan to test the capacity of the students to make outputs with the integration of ICT applications. This will allow the students to show the teachers they can integrate their lesson with the ICT concepts. The presence of gadgets nowadays is all over the place. Even schools are purchasing gadgets like computers and gadgets that students can use to make their projects and assignments.

Moreover, the use of ICT in appropriate contexts in education can add value to teaching and learning by enhancing the effectiveness of learning or by adding a dimension to learning that was not previously available. ICT may also be a significant motivational factor in students' learning and can support students' engagement with collaborative learning [24].

The significant relationship between the Perceived Usefulness, Ease of Use, and Behavioral Intention of ICT Integration among the technology education teachers in DepEd, Division of Cagayan de Oro City

In this correlational study, several key statistical assumptions were met to ensure the validity of the findings. Firstly, there was a linear relationship between the variables being studied. Secondly, the data was normally distributed for both variables. Thirdly, the variables were measured on a ratio scale. Lastly, there were no significant outliers that could skew the correlation. To conclude, all the assumptions were met by the researchers before running the data in SPSS version 23.

The Pearson product-moment correlation analysis revealed a statistically significant but weak positive relationship between perceived behavioral intention and perceived ease of use ($r = .278$, $p<0.01$), supporting Hypothesis 1. This indicates that increases in perceived ease of use are associated with slight increases in the intention to use ICT among participants. Similarly, Hypothesis 2 was confirmed by a weak positive correlation between perceived behavioral intention and perceived usefulness ($r = .353$, $p<0.01$), suggesting that marginal enhancements in perceived usefulness may slightly elevate intentions to use ICT. In contrast, a strong positive correlation was observed between perceived ease of use and perceived usefulness ($r = .817$, $p<0.01$), substantiating Hypothesis 3 and implying that improvements in ease of use significantly contribute to the perceived usefulness of ICT among respondents. Table 7 shows the correlation analysis

Table 7. Correlation Analysis

	Behavioral Intention	Ease of Use	Usefulness
Behavioral Intention	1		
Ease of Use	.278**	1	
Usefulness	.353**	.817**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The weak relationship between ease of use and usefulness to behavioral intention can be influenced by various factors. Perceived ease of use and perceived usefulness may not always directly translate into behavioral intention. Factors such as individual attitudes, external variables, and the context of technology integration can play a role in shaping this relationship [25]. Perceptions of ease of use and usefulness may not always match the user's real-world experience. While users may believe technology is user-friendly and beneficial in theory, practical implementation can reveal additional factors that influence their intentions and actions. Hence, if users have a positive attitude towards using a technology, it can strengthen the relationship between ease of use, usefulness, and their intention to use it. Moreover, the weak relationship between ease of use, usefulness, and behavioral intention is a complex interplay of various psychological, contextual, and attitudinal factors that influence how users perceive and ultimately decide to adopt technology.

On the other hand, the strong relationship between ease of use and usefulness in ICT among the respondents can attributed to several factors. The research findings of Eze, Obichukwu, and Kesharwani [26] teachers' attitudes towards

ICT acceptance play a crucial role in shaping the relationship between ease of use and usefulness in ICT. Positive attitudes towards technology adoption can enhance the perceived benefits and ease of use, leading to a stronger connection between the two. In addition, the study conducted by Ibrihim and Shiring (2022) [27] findings revealed that there was a strong positive correlation between educators' technology attitudes, perceived usefulness, and perceived ease of use of technology which later translate to educators' behavioral intentions to accept and adopt technology for teaching. There is a need for educators and administrators to work together to make technology integration seamless to maximize students learning.

4. CONCLUSION

Teachers were still young in their experience, and the training they acquired was somewhat related only to ICT. Moreover, their attitude towards ICT integration was not at the highest level. For teachers, ICT integration in teaching and learning TLE requires many things to consider like resources, connectivity, and gadgets. Integration of ICT tools and strategies requires attention, priorities, and actions. The strong positive relationship between ease and usefulness in ICT among the responders is influenced by their attitudes, perceptions of benefits, and the support they receive, all of which contribute to their actual ICT integration in school.

5. RECOMMENDATIONS

Based on the conclusions, the following recommendations were formulated:

1. Training/seminars in Information, Communication, and Technology (ICT) must be aligned with the teachers' and students' ideal ICT skills to create a better learning environment and outcomes.
2. ICT integration in teaching and learning TLE may focus first on the available materials and resources available in the school and the community so that while waiting for the needed ICT tools to be produced, the implementation still happens according to its implementation plan.
3. Actual ICT integration in teaching and learning TLE was significant. Therefore, school heads and teachers may help one another to ensure that its implementation will better impact the students' knowledge acquisition and performance.
4. Teachers' attitudes and awareness were significant predictors of the level of integration of ICT tools in the teaching and learning process. Therefore, planning activities like seminars and trainings must be given attention and priority.
5. Collaboration between educators and administrators is essential to facilitate smooth technology integration to enhance student learning outcomes.

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