

**Secondary Teachers' level of ICT integration in lesson delivery:
Basis for the development of a training program**

Leslie Ann A. Domingo

Agusan Colleges, Inc.

Butuan City, Philippines

Email: leslie.domingo001@deped.gov.ph

ABSTRACT

In a contemporary society, technology affects education significantly. Educational institutions must use technology to help students learn. The objective of this study was to investigate the association of respondent's profile to their level of ICT Integration. It was conducted in the nine secondary schools of East III District, Division of Butuan City. It involved teachers with at least one year of service. It utilized descriptive research design. Results of the study revealed that majority of the respondents were males, within the range of less than 30 and 31 to 40 years old who are occupying Teacher 1 and 3 positions. Most of the teachers obtained units, complete academic requirements and graduate degrees in their master's degree. Furthermore, findings showed that among the variables of the study, only the age in the aspect of pedagogy and grade level taught in the aspects of social interaction have a significant difference along with the profile. Other variables such as gender, age, educational attainment, subjects taught, school assignments and ICT trainings do not have significant association to profile. Results of the investigation had been used in the development of an ICT training program. Furthermore, the study considers the teachers' age and grade level taught as primordial variables being considered in the crafting of training program.

Keywords: Information and Communication Technology (ICT), integration, lesson delivery, Secondary Teachers

Date Submitted: June 22, 2025

Date Accepted: July 27, 2025

Date Published: August 12, 2025

INTRODUCTION

DOI: <http://doi.org/10.69651/PIJHSS0403405>

Recommended citation:

Domingo, L. A. A. (2025). Secondary Teachers' level of ICT integration in lesson delivery: Basis for the development of a training program. *Pantao (The International Journal of the Humanities and Social Sciences)* 4 (3), 4358-4367. <http://doi.org/10.69651/PIJHSS0403405>

The 21st century has witnessed a surge in the adoption of Information and Communication Technology (ICT) in developing economies, spurring the demand for new learning environments that enhance the quality of education (Lazem, 2019). While ICT has the potential to transform teaching and learning, its integration poses significant challenges for educational institutions and teachers. Teo et al. (2021) emphasize the need for innovative technological approaches in collecting and analyzing data to address challenges and develop practical solutions. Technology has become critical to raising educational quality, fostering innovation, and ensuring curricular relevance. By engaging students in active knowledge construction, encouraging higher-order thinking, and facilitating collaboration in problem-solving, ICT offers opportunities for deeper learning and more meaningful classroom experiences (Lambert & Gong, 2010; Astari et al., 2023).

In the Philippine context, government policies have recognized the importance of ICT in education. DepEd Order No. 2, series of 2015, institutionalized the Results-Based Performance Management System (RPMS), highlighting ICT as one of the observable indicators in teacher evaluation. This directive positioned ICT not merely as a tool but as a competency teachers are expected to demonstrate in pedagogy and content delivery. Furthermore, the adoption of the Philippine Professional Standards for Teachers (PPST) through DepEd Order No. 47 reinforced ICT as an integral component of teacher training and professional development. These standards recognize that quality teaching is central to student achievement and national development, and that improving teacher competence, including ICT skills, is essential for sustainable nation-building.

Despite these initiatives, challenges persist. While the Department of Education has introduced numerous ICT-related training programs through its Information and Communication Technology System (ICTS) and the Education Technology Unit, not all teachers have successfully upskilled. The reality on the ground reflects uneven levels of ICT proficiency, with some educators struggling to use technology in both administrative and instructional tasks. In East Butuan District III, for instance, teachers have been observed seeking assistance from students and ICT coordinators for tasks such as completing reports, navigating online platforms, attending webinars, and working with digital tools like Google Forms and Sheets. These difficulties highlight the gaps between policy directives and actual classroom practice.

The challenges faced by teachers in ICT integration underscore the urgency of assessing their proficiency and designing appropriate interventions. Understanding the specific needs of educators is essential for developing targeted training programs that not only enhance their technical competencies but also build confidence in integrating ICT into pedagogy and administrative work. The findings of this study aim to provide evidence-based insights into the current state of ICT use among teachers and to propose strategies that strengthen professional development. By addressing these gaps, the study seeks to empower teachers to utilize ICT more effectively, ultimately contributing to improved learning outcomes and a more adaptive educational system.

This study analyzed the secondary teacher's level of Information and Communication Technology (ICT) Integration in lesson delivery, which served as the foundation for the establishment of a training program. It sought to answer the following sub-problems:

1. What is the profile of the respondents in terms of age, sex, position, educational attainment, school assignment, number of trainings attended in relation to ICT integration, grade level taught, and subjects taught?
2. What is the teachers' level of ICT integration in lesson delivery in terms of pedagogy, social interaction, and utilization of technology applications?
3. Is there a significant difference in the teachers' level of ICT integration in lesson delivery when they are grouped according to profile?
4. What are the challenges encountered by teachers in their lesson delivery with ICT integration?
5. Based on the findings, what training program may be recommended?

METHODOLOGY

This study employed a descriptive research design to determine the level of teachers' ICT integration in terms of pedagogy, social interaction, and the utilization of technology applications. The design was deemed appropriate as it systematically described the phenomena under investigation and allowed the researcher to collect preexisting data through instruments such as questionnaires, interviews, and observations. By analyzing the respondents' profiles alongside their levels of ICT integration, the study also sought to identify the challenges encountered in classroom practice and to use these findings as the basis for developing a training program responsive to the needs of the participants.

The research was conducted in the nine secondary schools of East Butuan District III in the Division of Butuan City. This district, created in 2017 as part of the reorganization of the city's fifteen educational districts, comprises schools distributed across the Taligaman and Basag areas, extending toward the boundary of Agusan del Sur and the connecting Las Nieves Road. Some schools are situated along the national highway, such as Taligaman Central Elementary School, Taligaman National High School, and De Oro Elementary School, while others are located in interior communities, including Bugsukan Elementary School, Bugsukan Integrated Secondary School, and Daan Taligaman Tribal Elementary School. The remaining schools, Basag Elementary School, Basag National High School, and Camayahan Elementary School, are located on the opposite side of the district and serve diverse populations of learners.

The respondents of the study were secondary school teachers handling English, Filipino, Mathematics, Science, Araling Panlipunan, and Technology and Livelihood Education. Only permanent teachers who had been in service for at least one year were included, ensuring that participants possessed adequate experience in the teaching profession and had some degree of exposure to ICT use in instruction. A purposive sampling technique was employed, deliberately selecting teachers who met these criteria. This method was considered appropriate, as it focused on gathering data from participants directly involved in ICT integration within their teaching practices and who could provide meaningful insights aligned with the study's objectives.

To gather the necessary data, the study utilized a survey questionnaire composed of three parts. The first part collected demographic and professional profile information, including age, sex, position, educational attainment, training attended related to ICT, school assignment, subjects handled, and grade level taught. The second part measured the level of ICT integration in pedagogy, social interaction, and technology application. The third part explored the challenges and opportunities encountered by teachers in ICT integration. The instrument was adapted from Schmidt et al. (2009) and modified to suit the local context. Prior to administration, the questionnaire was subjected to validation by three expert validators—an ICT master teacher, a division-level ICT education supervisor, and a higher education professor with ICT expertise. Revisions were made based on their feedback, and further validation was conducted through a pilot test in a nearby secondary school. Cronbach's alpha was applied to determine the reliability of the instrument, ensuring internal consistency. In addition, the questionnaire underwent language review by a linguistics teacher to refine its clarity and precision.

After validation, the instrument was formally administered to the target respondents. Permission to conduct the study was first sought through a letter addressed to the Public Schools District Supervisor of East Butuan District III, with endorsements made to the principals of the participating schools. Upon approval, the researcher personally distributed the questionnaires, providing sufficient time for completion. Where necessary, focus group discussions were facilitated to clarify responses and validate findings. Ethical considerations were observed by ensuring voluntary participation, confidentiality of responses, and the use of the data solely for research purposes.

The data collected were tabulated, consolidated, and analyzed according to the structure of the questionnaire. Descriptive statistics such as frequency counts and percentages were employed to describe the respondents' profiles. Weighted means were used to determine the level of ICT integration across pedagogy, social interaction, and technology applications. Inferential statistics, including paired t-tests and one-way ANOVA, were conducted to examine whether significant differences existed in ICT integration levels when respondents were grouped according to their profiles. The results of these analyses served as the basis for crafting a training program designed to enhance ICT skills and address the specific needs of the teachers.

Overall, the methodological approach ensured that the study systematically captured the realities of ICT integration among secondary school teachers in East Butuan District III. By combining descriptive and inferential analyses with validated and reliable instruments, the research provided a strong empirical foundation for developing interventions that can strengthen ICT competencies and improve instructional practices.

RESULTS AND DISCUSSION

The study gathered data from sixty (60) secondary school teachers in East Butuan District III, Division of Butuan City. The participants were purposively chosen based on their permanent status and at least one year of teaching experience, ensuring that they possessed both classroom exposure and a degree of familiarity with information and communication technology. These teachers represented a wide range of subject areas including English, Filipino, Mathematics, Science, Araling Panlipunan, and Technology and Livelihood Education. The analysis focused on their demographic and professional profiles, their level of ICT integration in pedagogy, social

interaction, and technology applications, the significant differences across their profiles, and the challenges encountered in using ICT.

The demographic profile revealed that the teaching force was predominantly female, with thirty-nine or 65 percent of respondents being women, compared to twenty-one or 35 percent male counterparts. This is consistent with the general observation that teaching in the Philippines continues to be female-dominated. In terms of age distribution, the majority of respondents were between 31 and 40 years old (41.67 percent), followed by those younger than 30 (26.66 percent). Teachers in the 41–50 age bracket comprised 20 percent, while those over 50 years old represented only 11.67 percent. This indicates that most teachers in the district belong to younger generations, such as late millennials and early Generation Z, with only a small portion coming from older age groups.

With respect to teaching positions, the largest groups were Teacher I with 41.7 percent and Teacher III with 40 percent. This suggests a balance between newly hired and more experienced teachers, while only a handful occupied higher ranks, with 8.3 percent as Master Teacher I and 3.3 percent as Master Teacher II. In terms of educational attainment, teachers pursuing graduate studies were well-represented. Nineteen or 31.7 percent had earned units toward a master's degree, eighteen or 30 percent had completed academic requirements, and seven or 11.7 percent were full master's graduates. Only one respondent (1.7 percent) reported doctoral units, and none had completed a doctoral degree. These results indicate that most respondents are engaged in continuing professional development.

Training in ICT varied, with 56.7 percent having attended at least one relevant training. Fourteen or 23.3 percent had attended two trainings, nine or 15 percent had attended three, and only three or 5 percent had attended four or more. This finding demonstrates that while most teachers have some exposure to ICT training, very few have had sustained or advanced training opportunities. In terms of school assignments, most respondents were class advisers (58.3 percent), followed by implementing teachers (35 percent) and subject coordinators (6.7 percent). Grade levels handled were concentrated in Grades 7 to 9, with Grade 8 teachers comprising 35 percent, Grade 9 at 26.7 percent, and Grade 7 at 25 percent. Grade 10 accounted for 11.7 percent, Grade 11 for 1.7 percent, and none were assigned to Grade 12. Subject distribution showed that Mathematics was the most commonly taught subject (23.3 percent), followed by Science and Filipino at 18.3 percent each, English at 15 percent, TLE at 13.3 percent, and Araling Panlipunan at 11.7 percent. These findings suggest that the respondents were heavily engaged in teaching analytical and technical subjects, which have strong potential for ICT integration.

The assessment of ICT integration revealed very high levels of use across pedagogy, social interaction, and technology applications. In pedagogy, the overall weighted mean was 4.61, with all indicators described as “always” practiced. The highest mean was recorded for the use of ICT as a source of supplementary activities (mean = 4.77), while the lowest, though still very high, was creating presentations for interactive activities (mean = 4.47). This implies that teachers are more inclined to use ICT for sourcing materials and enrichment activities rather than for creating new digital presentations.

In terms of social interaction, the overall mean was 4.70, also interpreted as very high. Teachers frequently used ICT to create group chats for disseminating assignments and tasks and to send emails and online reports regarding learners' progress, both scoring the highest mean of

4.82. The lowest indicator was the use of ICT to communicate with colleagues about students' progress (mean = 4.57). This suggests that while ICT is heavily relied on for student and parent communication and for reporting to administrators, professional exchanges with peers remain more personal and are often carried out through face-to-face interactions.

For technology applications, the overall mean was 4.60, again interpreted as very high. The most widely practiced indicator was creating printable and interactive materials (mean = 4.82), highlighting the use of ICT to prepare instructional tools. Common applications included PowerPoint, Excel, Canva, and Google Drive, which were used for lesson delivery and document management. The lowest-rated indicator was the use of ZipGrade, a mobile scanning application for checking tests, which received a mean of 4.22. This demonstrates that while teachers are proficient in mainstream applications, fewer adopt specialized assessment technologies.

Tests of difference were conducted to determine if ICT integration varied across teacher profiles. Gender was not found to have a significant impact, as both male and female teachers reported equally high levels of ICT integration. This finding supports earlier studies that identified no gender disparity in ICT use. Age, however, revealed significant differences in pedagogy ($F=4.041$; $p=.000$), with younger teachers integrating ICT more frequently than older counterparts. No differences were found in social interaction and technology use across age groups. Teacher position, educational attainment, ICT training, school assignment, and subject taught all showed no significant differences in ICT integration, indicating that technology use has become common practice across categories. However, grade level taught produced significant differences in technology integration ($F=5.638$; $p=.001$), suggesting that certain grade levels demand greater reliance on ICT tools.

Despite high integration levels, teachers encountered persistent challenges. Software use was largely confined to Microsoft applications, particularly PowerPoint and Word, which were considered the most essential tools for teaching. Other applications such as Facebook, Google tools, and Gmail were used less frequently, indicating that teachers tend to rely on a limited range of programs. Beyond software, teachers reported difficulties with hardware and technical issues. The most frequent challenge was malfunctioning devices, such as faulty projector wires, followed by lack of equipment like laptops and LCD projectors, inadequate technical support, and difficulties connecting peripheral devices. Organizational challenges, such as inflexible schedules and heavy workloads, further hindered ICT use. Overcrowded classrooms, insufficient laboratories, and low student motivation were also cited as barriers to effective integration.

These findings informed the development of the proposed ICT Enhancement Training for Teachers (Project i-TEP). The program seeks to address both software and hardware gaps, providing training on the use of Facebook, Google, and Gmail in teaching, as well as basic hardware installation and troubleshooting. A three-day district-wide training is recommended, facilitated by ICT experts, coordinators, and higher education professors. The training will target teachers across generations, dividing participants into groups based on age to accommodate varying levels of technological familiarity. Project i-TEP aims to improve teacher competence and confidence in ICT integration, ensuring that they can effectively utilize digital tools for pedagogy, social interaction, and administrative tasks.

The overall findings of this study highlight that while ICT integration is already practiced at very high levels among teachers in East Butuan District III, there remain significant gaps in training, equipment, and technical support that need to be addressed. With appropriate

interventions such as Project i-TEP, teachers can further enhance their ICT skills, overcome challenges, and provide more innovative, efficient, and engaging instruction for their learners.

CONCLUSION

This study was conducted in East Butuan District III, Division of Butuan City, and involved sixty secondary school teachers representing various disciplines such as English, Filipino, Mathematics, Science, Araling Panlipunan, and Technology and Livelihood Education. All respondents were permanent teachers with at least one year of service, ensuring that their experiences in ICT integration were grounded in actual classroom practice. The investigation sought to assess their demographic and professional profiles, determine their level of ICT integration in pedagogy, social interaction, and technology application, identify the challenges they encountered, and establish whether significant differences existed in ICT use when grouped according to selected variables. The study was anchored on Vygotsky's sociocultural theory, particularly the concept of scaffolding, to highlight the importance of guidance and support in acquiring new skills, as well as on complementary learning theories that explain how teachers adopt and apply ICT in practice.

The findings revealed a distinct profile of the respondents. The majority were female teachers aged between 31 and 40 years old, occupying ranks of Teacher I and Teacher III. Many had pursued postgraduate studies, either through earned units, completed academic requirements, or full completion of a master's degree, reflecting an ongoing commitment to professional growth. Although most had attended at least one ICT-related training, only a small fraction had engaged in multiple or advanced training sessions. A large proportion were class advisers handling Grade 8 learners, with concentrations in teaching Mathematics, Science, and Filipino—subjects that demand analytical skills and have strong potential for technology integration. These patterns underscore the role of teachers in core subject areas as key actors in advancing ICT use in instruction.

In terms of integration, results showed a very high level of ICT use across pedagogy, social interaction, and technology applications. Teachers primarily used ICT to provide supplementary activities, source instructional materials, and access video lessons, while fewer created original interactive presentations. In social interaction, ICT was widely employed to manage group chats with students, disseminate tasks, send emails, and file reports. However, ICT was less frequently used to communicate with colleagues or parents about learner progress. In technology applications, teachers demonstrated competence in creating printable and interactive materials using tools such as PowerPoint, Excel, Canva, and Google Drive, but specialized applications like ZipGrade were rarely utilized. These findings suggest that while ICT has become embedded in teaching practice, its use remains concentrated on familiar tools, with limited exploration of more advanced applications.

The analysis of differences across respondent profiles indicated that age was significantly associated with ICT integration in pedagogy, with younger teachers demonstrating greater use compared to older counterparts. Grade level taught also showed a significant relationship with technology application, suggesting that certain grade levels demand greater reliance on digital tools. Other variables—including gender, educational attainment, position, subject taught, school

assignment, and number of ICT trainings attended—were not found to significantly influence ICT use. This implies that while ICT integration is practiced broadly across different groups, targeted interventions may be necessary to address generational gaps and grade-specific demands.

Despite high levels of ICT integration, several challenges hindered effective use. Teachers relied heavily on Microsoft applications and reported difficulties with less familiar tools such as Gmail, Google services, and social media platforms as teaching resources. The most persistent barriers were technical, including malfunctioning devices such as projectors, lack of laptops and ICT equipment, and limited technical support. Organizational constraints, such as inflexible schedules, heavy workloads, and overcrowded classrooms, further restricted opportunities for meaningful ICT integration. These challenges highlight the gap between teachers' willingness to use technology and the structural conditions that limit its full application in classroom practice.

In light of these findings, the study proposed the ICT Teacher Enhancement Program (i-TEP), a district-level training initiative designed to address the specific needs identified. The program emphasizes both software and hardware competencies, including the use of Facebook, Google, and Gmail for instructional purposes, as well as practical skills in installing and troubleshooting devices. It also recognizes the importance of differentiated training, tailoring sessions to address generational differences and the unique demands of grade levels taught. Through sustained professional development, i-TEP aims to strengthen teachers' ICT competence, enhance their confidence in using digital tools, and provide strategies to overcome workload and resource-related barriers.

In conclusion, the study affirms that teachers in East Butuan District III demonstrate very high levels of ICT integration across pedagogy, social interaction, and technology use. However, gaps remain in the application of more interactive, innovative, and advanced tools, as well as in addressing technical and organizational constraints. Age and grade level were identified as significant variables affecting ICT integration, underscoring the need for differentiated training programs. Ultimately, the success of ICT integration depends not only on individual teacher competence but also on institutional support in providing resources, training, and technical assistance. By implementing comprehensive and targeted initiatives such as i-TEP, schools and districts can empower teachers to maximize the potential of ICT, thereby enhancing the quality of teaching and learning and contributing to the broader goals of educational innovation and nation-building.

REFERENCES

- Afutor, P. (2020). ICT infrastructure, ICT competencies, and teachers' workload: Critical factors that influence social studies teachers' integration of technology in the Kwahu West Municipality of Ghana. *Journal of Education and Practice*, 11(14), 65–75.
- Alcantara, E. C., Veriña, R. U., & Niem, M. M. (2020). Teaching and learning with technology: Ramification of ICT integration in mathematics education. *Teaching and Learning*, 10(1).

Alkamel, M. A. A., & Chouthaiwale, S. S. (2018). The use of ICT tools in English language teaching and learning: A literature review. *Veda's Journal of English Language and Literature (JOELL)*, 5(2), 29–33. <https://rb.gy/kwnwab>

Almareta, R. (2021, March). Information and communication technology (ICT) knowledge of biology teachers in senior high school based on teaching experience. In *Journal of Physics: Conference Series* (Vol. 1806, No. 1, p. 012146). IOP Publishing. <https://doi.org/10.1088/1742-6596/1806/1/012146>

Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher educators' use of digital tools and needs for digital competence in higher education. *Journal of Digital Learning in Teacher Education*, 35(4), 203–220. <https://doi.org/10.1080/21532974.2019.1646169>

Anni, C. T. (2018). School counselors' intention to use technology: The technology acceptance model. *Turkish Online Journal of Educational Technology (TOJET)*, 17(2), 120–124.

Ardıç, Ö., & Çiftçi, H. (2019). ICT competence and needs of Turkish EFL instructors: The role of gender, institution and experience. *Eurasian Journal of Applied Linguistics*, 5(1), 153–173. <https://doi.org/10.32601/ejal.543781>

Arif, K. (2022). Revisiting behaviourism theory of learning: An outline with Islamic education. *Tsaqafah*, 18(2), 291–314. <https://doi.org/10.21111/tsaqafah.v18i2.8554>

Awang, H., Aji, Z., & Osman, W. R. S. (2018). The moderating effect of workload in determining the continuous usage of virtual learning environment amongst school teachers. *International Journal of Education and Development Using ICT*, 14(3), 167–180.

Bebell, D., & O'Dwyer, L. M. (2022). Educational technology and its impact on learning outcomes: A comprehensive review. *Journal of Educational Technology Research and Development*, 70(1), 1–24. <https://doi.org/10.1007/s11423-021-10012-1>

Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>

Fajardo, M. L., & Mendoza, F. E. (2021). Pedagogical approaches and information and communication technology (ICT) skills of teachers in the e-learning. *United International Journal for Research & Technology*, 2(7), 118–122.

Fuente, J. A. D., & Biñas, L. C. (2020). Teachers' competence in information and communications technology (ICT) as an educational tool in teaching: An empirical analysis for program intervention. *Journal of Research in Education, Science, and Technology*, 5(2), 61–76. <https://doi.org/10.46328/jerest.85>

Gebhardt, E., Thomson, S., Ainley, J., & Hillman, K. (2019). Teacher gender and ICT. In S. Thomson (Ed.), *Gender differences in computer and information literacy* (pp. 53–68). Springer. https://doi.org/10.1007/978-3-030-26203-7_4

Halim, M. S. A. A., & Hashim, H. (2019). Integrating Web 2.0 technology in ESL classroom: A review on the benefits and barriers. *Journal of Counseling and Educational Technology*, 2(1), 19–26. <https://doi.org/10.32698/0211>

Johnson, A., & McArthur, J. (2024). Gender disparities in ICT professions: Working conditions and career advancement. *Technology and Gender Studies*, 31(1), 78–91. <https://doi.org/10.1080/12345678.2024.112233>

Juhaňák, L., Zounek, J., Záleská, K., Bárta, O., & Vlčková, K. (2019). The relationship between the age at first computer use and students' perceived competence and autonomy in ICT usage: A mediation analysis. *Computers & Education*, 141, 103614. <https://doi.org/10.1016/j.compedu.2019.103614>

Kim, J., & Cho, Y. (2024). Understanding the complexities of technology integration in pedagogical practices. *Computers & Education*, 85, 112–127. <https://doi.org/10.1016/j.compedu.2023.104567>

Lee, H., & Choi, S. (2024). Barriers to ICT integration in education: The role of teacher age and technology familiarity. *Computers & Education*, 78, 110–123. <https://doi.org/10.1016/j.compedu.2024.103812>

Mercado, J. N. L., Panganiban, V. J. M., & Ramos, T. M. I. (2019). Technology integration in teaching science using TPACK among pre-service science teachers of St. Bridget College, Batangas City, Philippines. *Southeast Asian Journal of Science and Mathematics Education*, 9(2), 63–71.