

Personalized Learning Experience in Information and Communication Technology on Learners' Autonomy and Engagement

Yvonne Faye A. Omaña¹, Roie M. Ubayubay, PhD²

¹Teacher, Department of Education

²Public Schools District Supervisor, Department of Education

Abstract

Integrating Information and Communication Technology (ICT) into education provides opportunities to create personalized learning experiences that address learners' individual needs, interests, abilities, and learning preferences. However, the inconsistent implementation of ICT, limited resources, inadequate training, and uneven technological infrastructure may affect the development of learners' autonomy and engagement. This study aimed to determine the level of personalized learning experience in ICT and learners' autonomy and engagement in Talakag I and II Districts, Division of Bukidnon, during School Year 2024-2025. Specifically, this aimed to find out the teacher-respondents' assessment of the level of personalized learning, examine the learner-respondents' levels of autonomy and engagement, and determine the significant relationship between the teacher-respondents' personalized learning experiences and learners' respondents on autonomy and engagement. The study employed a descriptive-correlational research design. The respondents were one hundred fifty (150) Grade 5 teachers and 300 Grade 5 learners. Purposive sampling was applied to include all eligible selected Grade 5 teachers and learners in the district. Data were gathered using a patterned and modified research questionnaire and analyzed using mean, standard deviation, and Pearson Product-Moment Correlation Coefficient.

The findings revealed that the personalized learning experience in ICT was very high, with multimedia content obtaining the highest mean among its variables. Learners' autonomy was found to be high, with self-directed learning obtaining the highest mean. Learner engagement was also high, with relevant and meaningful content obtaining the highest mean. The results further showed a significant positive relationship between personalized learning experience and learners' autonomy, as well as between personalized learning experience and learner engagement. The study concludes that Multimedia Content resources helps to review and reinforce learning. It becomes more effective when tailored to learners' specific needs, helping visualize complex concepts and improving understanding. It fosters active participation by combining text, sound, and visuals that suit diverse learning styles. Further, Self-Directed Learning highlights learners' capacity to plan, execute, and assess their learning to improve based on their assessment. Moreover, relevant and meaningful content plays a pivotal role in capturing learners' interest and fostering sustained engagement for learners' content solve real-world problems.

Keywords: Personalized learning experience, autonomy, engagement

1. Introduction

The integration of Information and Communication Technology (ICT) in education has transformed teaching and learning by providing personalized learning experiences that address learners' needs, interests, abilities, and learning preferences. Through digital platforms, multimedia resources, self-paced instruction, adaptive feedback, and collaborative activities, learners can develop autonomy, self-regulation, motivation, and active engagement. These approaches support learner centered education and promote essential twenty first century competencies such as digital literacy, critical thinking, and collaborative problem solving. However, the implementation of personalized ICT learning remains uneven, particularly in developing countries and rural communities where inadequate infrastructure, limited internet connectivity, insufficient digital devices, and lack of teacher training continue to hinder effective technology integration. In the Philippines, these challenges are evident in the Districts of Talakag I and II in Bukidnon, where schools face difficulties in adopting technology enhanced instructional practices. Therefore, this study examines the extent of personalized learning experiences in ICT and their perceived relationship with learners' autonomy and engagement, focusing on adapted learning pathways, self-paced instruction, multimedia integration, customizable content, learner centered practices, self-directed learning, motivation, interactivity, relevance, collaboration, and communication. The findings are expected to provide insights into improving personalized ICT integration and promoting meaningful, engaging, and learner centered educational experiences, particularly in rural school settings.

Research Questions

This study aimed to determine the level of personalized learning experiences in Information and Communication Technology (ICT) and learners' autonomy and engagement in Talakag I and II Districts, Division of Bukidnon, during the School Year 2024–2025.

Specifically, this study sought to answer the following questions:

1. What is the teacher-respondents' level of assessment on personalized learning experience in terms of adapted learning, self-paced learning, multimedia content, and customization content?
2. What is the learner respondents' level of autonomy based on learner-centered, self-directed learning, and motivation?
3. What is the learner-respondents' level of engagement with regard to interactive learning, relevant content, collaboration, and communication?
4. Is there a significant relationship between the teacher-respondents' assessed level of personalized learning experience and learner-respondents' autonomy?
5. Is there a significant relationship between the teacher-respondents' assessed level of personalized learning experience and learner-respondents' engagement?

Significance

This study was significant to the Division of Bukidnon because it provided insights into how personalized learning experiences in Information and Communication Technology enhanced learners' autonomy and engagement in elementary education, particularly in the Talakag I and II Districts. The findings helped school heads and DepEd administrators develop effective strategies for integrating adaptive technologies and learning platforms to promote differentiated instruction and improve learning outcomes. Teachers gained a better understanding of how to tailor digital resources and instructional approaches to learners' individual needs, abilities, and progress. Parents also benefited by recognizing the importance of ICT

supported learning in monitoring academic development, providing appropriate support, and encouraging independent learning. Learners were expected to benefit from more flexible, engaging, and student-centered learning environments that promoted active participation, self-directed learning, and academic achievement. Furthermore, the study served as a valuable reference for future researchers exploring personalized learning, educational technology, learner autonomy, and engagement, particularly in rural elementary school settings.

Scope and Limitations

This study focused on determining the teacher-respondents' personalized learning experiences in Information and Communication Technology (ICT) and autonomy and engagement in the elementary schools of the Talakag I and II Districts, Division of Bukidnon, during the School Year 2024-2025. The respondents are the one hundred fifty (150) grade five teachers and three hundred Grade 5 learners in the aforesaid districts. The independent variables are limited only to teacher-respondents' personalized learning experience in terms of adapted learning, self-paced learning, multimedia content, and customization content. Furthermore, the dependent variables are limited to learner-respondents' autonomy and engagement. Autonomy concerns learner-centered, self-directed learning and motivation, whereas engagement concerns interactive learning, relevant and meaningful content, and collaboration and communication.

Literature Review

Personalized Learning Experience

Personalized learning places learners at the center of instruction by adapting content, strategies, and activities to their individual needs, interests, abilities, and learning pace. Chen et al. (2021) emphasized that adaptive learning technologies promote autonomy, motivation, and self-monitoring by providing content suited to learners' performance and progress. Similarly, Dixit and Sarode (2024) highlighted that self-paced learning and personalized multimedia improve understanding, focus, and engagement by allowing learners to control their learning experiences. Yaseen et al. (2024) explained that customized multimedia resources, including videos, simulations, and animations, make complex concepts easier to understand and encourage active participation. Moreover, Liu, Wang, and Lin (2022) found that customizable learning content strengthens learners' sense of ownership, motivation, and self-directed learning by allowing them to select learning pathways and adjust content presentation according to their preferences. Overall, personalized learning supports cognitive and emotional development by providing flexible, engaging, and inclusive learning experiences that enhance learner autonomy, academic performance, and sustained participation.

Learner Autonomy

Learner autonomy refers to students' ability to manage their learning independently through goal setting, self-regulation, time management, reflection, and informed decision making. Zhang and Liu (2021) emphasized that learner centered instruction supported by ICT promotes engagement and achievement by adapting learning experiences to individual preferences. Garrison (2020) highlighted that self-directed learning encourages students to plan, monitor, and evaluate their progress, strengthening ownership and lifelong learning habits. Similarly, Smith and Johnson (2021) found that relevant and personalized content enhances motivation and participation by connecting lessons to learners' interests, experiences, and goals.

Torres and Kim (2021) also stressed that ICT supported collaboration strengthens engagement through peer interaction, shared responsibility, and mutual support. Furthermore, Lee and Park (2021) explained that timely communication and feedback help learners overcome difficulties, sustain motivation, and develop confidence in digital learning environments. Overall, personalized ICT learning promotes learner autonomy by providing meaningful content, flexible learning opportunities, supportive communication, and collaborative experiences that strengthen independence, critical thinking, and active engagement.

2. Methodology

Research Design

This research employed a descriptive-correlational design. It investigated the extent of personalized learning experiences in Information and Communication Technology (ICT) and their influence on learners' autonomy and engagement in the Districts of Talakag I and II, Division of Bukidnon. By integrating both quantitative and qualitative methods, the study provided a comprehensive understanding of how ICT-enabled personalization affected student learning behaviors. This aligned with Kuhn's (2024) view that mixed methods enhanced the study of complex educational phenomena by combining statistical analysis with narrative insights, thereby increasing validity, flexibility, and interpretive depth. The quantitative component employed descriptive and correlational designs to assess dimensions of personalized learning, including adapted learning, multimedia content, self-paced instruction, and customizable content, and examined their relationships with learner autonomy and engagement. The qualitative component, guided by Tenny et al. (2022), involved selected interviews and open-ended responses to explore how personalized ICT practices were applied in real classroom settings and their impact on students' motivation, participation, and independence. Together, these approaches generated evidence-based insights to inform future ICT-based instructional strategies.

Participants

This study involved one hundred fifty (150) Grade 5 teachers and three hundred (300) Grade 5 learners from various public elementary schools across one of the districts in the Division of Bukidnon. These respondents represented a broad range of educational contexts, teaching backgrounds, and levels of professional development, many of whom had participated in seminars and training programs on instructional quality and ICT integration. Their diverse experiences provided a well-rounded perspective on how personalized ICT-based learning influenced learner autonomy and engagement and how these practices were shaped by leadership and resource availability across the district.

The participating teachers and learners provided essential data for assessing the implementation and impact of personalized learning through ICT. Teachers evaluated the extent to which ICT supported adapted and self-paced learning, as well as multimedia and customizable content, and how these influenced student motivation, independence, and interaction. Learners reflected on their experiences with these technologies and their perceptions of engagement and self-directed learning. The inclusion of both perspectives ensured a comprehensive analysis of the relationship between ICT-driven personalization and learner outcomes, supporting a deeper understanding of effective educational practices in Talakag's diverse learning environments.

Data Collection

The instrument used to gather the data was a questionnaire composed of three parts, each corresponding to the significant variables under investigation.

Part I examined teacher-respondents' personalized learning experiences, including adapted learning, self-paced learning, as well as multimedia content, and customization content. This was patterned and modified from the study of Zhang (2021) entitled “Personalization and Learner-Centeredness in ICT.”

Parts II A and B elicited learner-respondents' autonomy and engagement. Autonomy, based on learner-centered, self-directed learning and motivation, and engagement with regard to interactive learning, relevant and meaningful content, and collaboration and communication, were patterned and modified from the study by Zenouzagh (2023), entitled “Learners’ Autonomy, Learners’ Engagement and Learners’ Satisfaction.” Learner-respondents on learners’ autonomy assessed learner-centered practices, self-directed learning, and motivation, exploring both intrinsic and extrinsic factors that influenced learners’ willingness to engage with ICT-based tasks. In contrast, learner-respondents on learners’ engagement focused on interactive learning, relevant and meaningful content, and collaboration and communication

Data Analysis

After collecting and recording the study data, the researcher used the following statistical tools. Descriptive statistics, including mean and standard deviation, were used to describe the variables in the study. In addition, the Pearson Product-Moment Correlation Coefficient (r) was used to determine the significance of the relationship between teacher-respondents’ personalized ICT learning experiences and learners’ autonomy and engagement.

3. Results and Discussions

Problem 1. What is the teacher-respondents' level of assessment on personalized learning experience in terms of adapted learning, self-paced learning, multimedia content, and customizable content?

Table 1

Summary Distribution of Teachers’ Level of Personalized Learning Experience

Variable	Mean	SD	Interpretation
Adapted Learning	3.40	0.60	Very High
Self-Paced Learning	3.47	0.58	Very High
Multimedia Content	3.50	0.58	Very High
Customization Content	3.47	0.55	Very High
Overall	3.46	0.48	Very High

Table 1 presents the teachers’ levels of personalized learning experience, which obtained an overall mean of 3.46 (SD = 0.48), interpreted as Very High. This indicates that teachers consistently adjust instructional materials and teaching strategies to address learners’ diverse needs, abilities, and learning levels. Multimedia content received the highest mean of 3.50 (SD = 0.58), interpreted as Very High, suggesting that teachers frequently use videos, pictures, presentations, and other digital resources to make lessons more interesting, understandable, and engaging. These resources encourage active participation, improve understanding, and help learners retain important concepts. Meanwhile, adapted learning obtained the

lowest mean of 3.40 (SD = 0.60), although it was still interpreted as Very High. This indicates that teachers make efforts to modify learning materials, activities, and instructions according to learners' abilities, interests, and learning pace. The findings emphasize the importance of flexibility, creativity, and thoughtful instructional planning in providing meaningful learning experiences. Multimedia resources offer varied ways of presenting information, while adapted learning helps ensure that activities are appropriate to learners' levels of understanding. Overall, the results highlight the value of personalized learning in promoting learner participation, confidence, motivation, and understanding through the effective integration of technology and differentiated instructional strategies.

Problem 2. What is the learner-respondents' level of autonomy based on learner-centered, self-directed learning, and motivation?

Table 2
Summary Distribution of Respondents' Level of Learners' Autonomy

Variable	Mean	SD	Interpretation
Learner-Centered Learning	3.22	0.68	High
Self-Directed Learning	3.28	0.65	Very High
Motivation	3.26	0.62	Very High
Overall	3.25	0.65	High

Table 2 presents the learner respondents' level of autonomy, which obtained an overall mean of 3.25 (SD = 0.65), interpreted as High. This indicates that learners are gradually developing independence and responsibility in their learning but still need guidance and encouragement from teachers and family members to make decisions, manage responsibilities, and overcome challenges. Self-directed learning received the highest mean of 3.28 (SD = 0.65), interpreted as Very High, suggesting that learners demonstrate the ability to manage their learning pace, organize school tasks, set priorities, and develop time management skills. These findings highlight the importance of providing learners with opportunities to practice independent learning while receiving appropriate guidance and feedback. Meanwhile, learner centered learning obtained the lowest mean of 3.22 (SD = 0.68), interpreted as High. This suggests that learners value collaboration, sharing ideas, and participating in group activities, although opportunities to strengthen their active involvement and personal responsibility in learning remain important. Collaborative activities can promote communication, teamwork, problem solving, and understanding through the exchange of ideas and experiences. Overall, the findings emphasize that learner autonomy develops through a balance of independence, teacher support, family encouragement, and collaborative learning opportunities, enabling learners to become more confident, responsible, and actively involved in their educational progress.

Problem 3. What is the learner respondents' level of engagement with regard to interactive learning, relevant content, collaboration, and communication?

Table 3

Summary Distribution of Learner-Respondents' Level of Engagement

Variable	Mean	SD	Interpretation
Interactive Learning	3.28	0.68	Highly Engaged
Relevant and Meaningful Content	3.34	0.65	Highly Engaged
Collaboration and Communication	3.29	0.62	Highly Engaged
Overall	3.30	0.65	Highly Engaged

Table 3 presents the learner respondents' level of engagement, which obtained an overall mean of 3.30 (SD = 0.65), interpreted as Highly Engaged. This indicates that learners actively participate in classroom activities, complete school tasks, and express their ideas with confidence in a supportive learning environment. Relevant and meaningful content received the highest mean of 3.34 (SD = 0.65), interpreted as Highly Engaged, suggesting that learners demonstrate greater interest and motivation when lessons are connected to their personal experiences, daily lives, and future goals. Providing age-appropriate examples and relating new concepts to learners' prior knowledge can improve understanding, encourage participation, and make learning more meaningful. Meanwhile, interactive learning obtained the lowest mean of 3.28 (SD = 0.68), although it was still interpreted as Highly Engaged. This indicates that learners remain engaged in interactive activities, including discussions, hands on tasks, and collaborative exercises, which promote active participation, critical thinking, communication, and problem solving. The findings emphasize the importance of providing meaningful, relevant, and interactive learning experiences that sustain learners' interest and confidence. Overall, effective teacher guidance, constructive feedback, opportunities for participation, and connections between lessons and real-life experiences contribute to stronger learner engagement and more meaningful educational outcomes.

Problem 4. Is there a significant relationship between the teacher-respondents' assessed level of personalized learning experience and learner-respondents' autonomy?

Table 4

Test Results on the Significant Relationship Between the Teachers' Respondents' Assessed Level of Personalized Learning Experience and Learner-Respondents' Autonomy

Personalized Learning Experience	Learners Autonomy			Overall r-value p-value interpretation
	Learner-centered	Self-directed learning	Motivation	
	r-value	r-value	p-value	
	p-value	p-value	interpretation	
	interpretation			

				interpreta- tion
Adapted Learning	0.517 0.001 S	0.425 0.001 S	0.533 0.001 S	0.492 0.001 S
Self-paced Learning	0.467 0.001 S	0.455 0.001 S	0.461 0.001 S	0.461 0.001 S
Multimedia Content	0.455 0.001 S	0.479 0.001 S	0.584 0.001 S	0.506 0.001 S
Customization Content	0.569 0.001 S	0.588 0.001 S	0.447 0.001 S	0.535 0.001 S

Table 4 presents the relationship between teachers' personalized learning experiences and learner respondents' autonomy, revealing a significant positive correlation ($r = 0.499$, $p = 0.001$). All sub variables also showed significant positive relationships with learner autonomy, including adapted learning ($r = 0.492$, $p = 0.001$), self-paced learning ($r = 0.461$, $p = 0.001$), multimedia content ($r = 0.506$, $p = 0.001$), and customized content ($r = 0.535$, $p = 0.001$), leading to the rejection of the null hypothesis. These findings indicate that personalized learning experiences support learners' independence, confidence, motivation, and responsibility by providing instructional materials and activities suited to their needs, abilities, interests, and learning pace. Adapted learning helps learners participate confidently through appropriate instructional adjustments, while self-paced learning allows them to manage their progress and spend more time understanding challenging concepts. Multimedia content, such as videos, pictures, graphics, and simulations, makes lessons clearer and more engaging, encouraging learners to explore topics independently. Customized content obtained the strongest correlation, suggesting that learning materials tailored to learners' individual needs and preferences are particularly associated with greater autonomy. Overall, the findings emphasize that effective personalized learning strategies can encourage learners to take initiative, make responsible learning decisions, develop critical thinking skills, and become more actively involved in their educational progress.

Problem 5. Is there a significant relationship between the teacher-respondents' assessed level of personalized learning experience and learner-respondents' engagement?

Table 5

Test Results on the Significant Relationship Between Teacher-Respondents' Assessed Level of Personalized Learning Experience and Learner-Respondents' Engagement

Personalized Learning Experience	Learners Engagement	Overall		
		Interactive Learning	Relevant and Meaningful Content	Collaboration and Communication
		r-value p-value interpretation	r-value p-value interpretation	r-value p-value interpretation
Adapted Learning		0.537 0.001 S	0.532 0.001 S	0.536 0.001 S
Self-paced Learning		0.529 0.001 Si	0.557 0.001 S	0.552 0.001 S
Multimedia Content		0.477 0.001 S	0.479 0.001 S	0.484 0.001 S
Customization Content		0.569 0.001 S	0.568 0.001 S	0.587 0.001 S

Table 5 presents the relationship between teachers' personalized learning experiences and learner respondents' engagement, revealing a significant moderate positive correlation ($r = 0.534$, $p = 0.001$), leading to the rejection of the null hypothesis. All sub variables also showed significant positive relationships with learner engagement, including adapted learning ($r = 0.492$, $p = 0.001$), self-paced learning ($r = 0.461$, $p = 0.001$), multimedia content ($r = 0.506$, $p = 0.001$), and customized content ($r = 0.535$, $p = 0.001$). These findings indicate that personalized learning experiences are associated with greater learner interest, motivation, participation, and involvement in classroom activities. Adapted learning helps learners engage more confidently by providing activities suited to their abilities and understanding, while self-paced learning allows them to review difficult topics, manage their progress,

and develop confidence. Multimedia content makes lessons more interesting and understandable through videos, animations, pictures, and interactive resources that accommodate different learning needs. Customized content obtained the strongest correlation, suggesting that instructional materials and activities tailored to learners' interests, abilities, and preferences are particularly associated with higher engagement. Overall, the findings emphasize the importance of flexible, meaningful, and learner centered instructional strategies in promoting active participation, sustained attention, independent exploration, and positive learning experiences.

4. Conclusion and Recommendations

Conclusion

The following conclusions are hereby drawn for the study:

The study concludes that multimedia content helps bridge knowledge gaps by presenting information in multiple formats and supports personalized learning by making lessons more inclusive and stimulating. It becomes more effective when tailored to learners' specific needs, which helps visualize complex concept and improve understanding. Furthermore, self-directed learning highlights learners' capacity to plan, execute, and assess their learning to improve based on their assessment. Moreover, relevant and meaningful content plays a pivotal role in capturing learners' interest and fostering sustained engagement for learners to solve real-world problem.

Recommendations

Based on the results of this study, the following are recommended:

1. School administrators and teachers should strengthen adaptive teaching strategies by using ICT tools and activities suited to learners' different needs and abilities.
2. Teachers should provide more opportunities for learner choice and participation to support autonomy and active involvement in learning.
3. Teachers should use group activities, discussions, and technology-based tasks to increase learner engagement.
4. Teachers should provide flexible digital learning resources that allow learners to learn at their own pace with appropriate guidance.
5. Teachers should continue using multimedia resources such as videos, pictures, and animations to sustain interest and improve understanding.

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