

IMPACT OF ECHO (End-of-Class-Hurdle) JOURNAL ON REDUCING LEARNING LOSS IN EMPOWERMENT TECHNOLOGY SUBJECT

Von P. Gabayan Jr.¹, Prince Ariel R. Alvaro²

¹ Instructor I, Nueva Vizcaya State University, Bayombong Nueva Vizcaya

² Teacher II, Isabela School of Arts and Trade – Main, City of Ilagan, Isabela

Email: vp_gabayanjr@nvsu.edu.ph, princeariel.alvaro@deped.gov.ph

D.O.I: 10.5281/zenodo.15720545

ARTICLE INFORMATION

Received: 18th April, 2025

Accepted: 22nd May, 2025

Published: 23rd June, 2025

KEYWORDS: ECHO Journal,
Learning Loss, Empowerment
Technology, Reflective Learning,
Educational Intervention

PUBLISHER: Empirical
Research Institute of Nigeria

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ABSTRACT

*This study assessed the effectiveness of the End-of-Class-Hurdle (ECHO) Journal as an intervention to reduce learning loss and enhance student performance in the Empowerment Technology subject among Grade 11 TechVoc students at Isabela School of Arts and Trade for the school year 2024–2025. Using a descriptive quantitative research design, the study involved 143 students selected through simple random sampling. A diagnostic pre-test was conducted to identify existing learning losses in the Most Essential Learning Competencies (MELCs), followed by the implementation of the ECHO Journal and a post-test evaluation. Additionally, a validated survey instrument was used to gather students' perceptions of the benefits and challenges of the journal. The findings revealed that students initially exhibited low to very low mastery across key technology topics. After the intervention, students demonstrated moderate to high mastery, with a statistically significant difference between pre-test and post-test scores as shown by the paired sample *t*-test ($t = 21.37$, $p < 0.05$). Students strongly agreed that the journal improved their focus, comprehension, and retention, while only minimal challenges were reported. The study concluded that the ECHO Journal was an effective tool for reflective learning, fostering knowledge reinforcement and addressing learning deficiencies in technology-based education. It recommended further exploration of the journal's application in other subjects and contexts, including digital and blended learning environments.*

1. Introduction

In the wake of the COVID-19 pandemic, educational systems across the globe faced unprecedented disruptions, resulting in significant learning losses among students. One of the most affected areas in the Philippine senior high school curriculum is the Empowerment Technology subject, which plays a crucial role in equipping learners with vital digital literacy and ICT competencies. These skills are particularly important in the 21st century as society becomes increasingly reliant on technology. However, despite the gradual return to face-to-face learning, many students still struggle to regain lost competencies, particularly in writing, comprehension, and the application of technological tools in practical contexts (Hasudungan & Ningsih, 2021; Cho et al., 2021). As digital education expands, bridging the gaps in students' learning becomes more urgent and critical.

The persistence of learning loss in Empowerment Technology is caused not only by school closures but also by limited access to appropriate learning resources, low motivation, and lack of continuous assessment strategies tailored to technology-based subjects (Asadullah & Bhattacharjee, 2022; GECOBEE et al., 2022). Moreover, the insufficient monitoring and formative evaluation of students' cognitive progress have contributed to a wider achievement gap. Students often fail to retain and apply concepts learned due to the absence of reflective and metacognitive learning tools. In subjects that require both conceptual understanding and application, such as Empowerment Technology, this learning loss hampers students' preparedness for further education or employment in a digitally-driven economy.

To address this concern, there is a need for an innovative and sustainable pedagogical intervention that not only tracks student learning but also enhances their retention and reflective thinking. The End-of-Class-Hurdle (ECHO) Journal is proposed as a strategic tool to combat learning loss. ECHO Journal is a formative assessment method where students summarize key learnings at the end of each class session, allowing for self-reflection and knowledge reinforcement. Studies such as Ecija (2023) have demonstrated the effectiveness of ECHO-style exit slips in enhancing writing and comprehension skills. By adopting this strategy in Empowerment Technology classes, teachers can better monitor student learning while fostering a habit of critical thinking and continuous improvement among learners. The proposed study seeks to investigate the effectiveness of this intervention in addressing learning deficiencies. The research aims to measure how the integration of ECHO Journals influences knowledge retention, student engagement, and performance in Empowerment Technology. It aligns with Sustainable Development Goal (SDG) 4 – Quality Education, which advocates for inclusive and equitable quality education and promotes lifelong learning opportunities for all. By targeting the reduction of learning loss and enhancing digital competency through reflective learning, the study contributes to improving educational quality, particularly in a post-pandemic context.

The integration of the ECHO Journal serves as a viable solution to an ongoing educational challenge. By encouraging consistent student reflection and providing teachers with real-time learning feedback, this approach fosters a more responsive and learner-centered environment. If proven effective, this strategy may serve as a model intervention for other subjects experiencing similar learning gaps, thus supporting national efforts toward educational recovery and resilience in line with global sustainable development priorities.

Statement of the Problem:

This research aims to assess the effectiveness of the ECHO (End-of-Class-Hurdle) Journal in reducing learning loss and improving students' empowerment technology skills. Specifically, it aims to answer the following questions:

1. What are the learning losses in the empowerment technology's most essential topics of the Most Essential Learning Competencies?

2. What are the perceived benefits and challenges of using the ECHO Journal in empowerment technology?
3. What is the learning gained in the empowerment technology's most essential topics of the Most Essential Learning Competencies after the implementation of the ECHO Journal?
4. Is there a significant difference between the Pre-test and the Post Test after the implementation of the ECHO Journal?

ADOPTED INNOVATION, INTERVENTION, AND STRATEGY

The Project ECHO or “End-of-Class-Hurdle on One Paragraph” is a tool that encourages students to reflect on their learning experiences, consolidate their knowledge, and bridge the gap between theory and practices. It is a pedagogical approach that combines elements of reflective practices and journaling. It provides students with a structured framework to reflect on learning experiences, identify areas and set goal for improvement (Ecija, 2023). This innovation was introduced to measure the influence of the innovation on students' writing abilities. Hence, the researchers would like to adapt the Project ECHO and incorporate it to a Student's Journal Activity to enhance the learning experience, key concepts to reduce learning loss and improve students' empowerment technology skills.

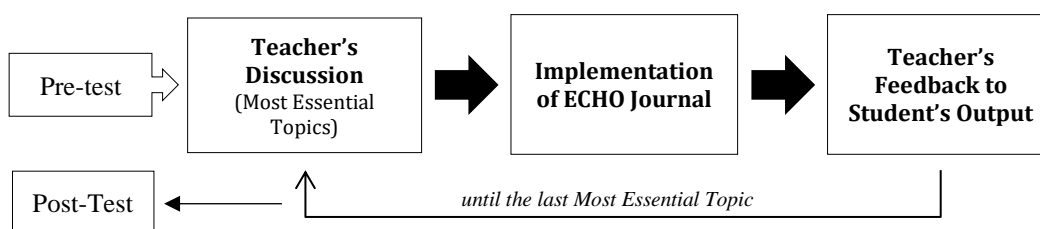


Figure 1. Structure in the Implementation of ECHO Journal

Figure 1 shows the proposed structure in the implementation of ECHO Journal. It will be typically implemented at the end of the class sessions, allowing students to summarize key concepts, clarify doubts, and apply their learning to empowerment technology topics and most essential learning competencies. A Pre-test Evaluation will be administered to determine the learning loss based on the Most Essential Topics in Empowerment Technology; thus, this will be introduced during the 1st session as starting point of the ECHO Journal. After the last session, a Post-test will be administered to compare if the learning loss were improved. Each topic/session, the learners will create a creative summary of the key concepts with examples, write reflections and learning experiences. After the session, the teacher will collect the journals and will give feedback to boost their confidence and check their errors in constructing their paragraphs or reflections as well as check the learning experiences of the learners. ECHO Journal will be return on the next session.

METHODOLOGY

This study employed a descriptive quantitative research design to examine learning loss and evaluate the implementation of the ECHO Journal among Grade 11 Tech-Voc track students enrolled in Empowerment Technology at Isabela School of Arts and Trade for the school year 2024–2025. A total of 143 students were selected from a population of 225 using the Raosoft Online Sample Size Calculator and simple random sampling to ensure equal representation. Data collection involved a diagnostic test based on the Most Essential Learning Competencies to assess learning loss and gains, and a validated survey questionnaire to

evaluate students' perceptions of the ECHO Journal's benefits and challenges. Data were analyzed using frequency distribution, percentage, weighted mean, and ANOVA to determine significant findings.

RESULTS

Table 2. Pre-Test Results on Most Essential Learning Competencies in Empowerment Technology Subject

Topic	MELC Code	Mean Score	% Score	Interpretation
1. ICT concepts and applications	E11/12-Ia-CT-1	6.2 / 15	41.3%	Low Mastery
2. Online safety, security, and ethics	E11/12-Ib-CT-2	5.8 / 15	38.7%	Low Mastery
3. Productivity tools (e.g., word processing)	E11/12-Ic-CT-3	7.1 / 15	47.3%	Low Mastery
4. Online collaboration tools	E11/12-Id-CT-4	6.5 / 15	43.3%	Low Mastery
5. Designing ICT projects for social change	E11/12-Ie-CT-5	4.9 / 15	32.7%	Very Low Mastery

Table 2 reveals that students demonstrated significant learning losses across all Most Essential Learning Competencies (MELCs) in Empowerment Technology prior to the implementation of the ECHO Journal. The lowest performance was observed in the topic "Designing ICT projects for social change" with a mean score of 4.9 out of 15 (32.7%), indicating very low mastery. Similarly, "Online safety, security, and ethics" also reflected very low mastery with a 38.7% score, highlighting a critical gap in students' understanding of digital responsibility. Other topics such as "ICT concepts and applications" (41.3%), "Online collaboration tools" (43.3%), and "Productivity tools" (47.3%) showed low mastery, suggesting insufficient prior knowledge and skills. Overall, the results underscore the need for a targeted intervention like the ECHO Journal to address these learning gaps and support students in regaining essential competencies in the subject.

Table 3. Perceived Benefits in using the ECHO Journal in Empowerment Technology

Indicators	Mean	Interpretation
1. Helped me reflect on what I learned each session	3.56	Strongly Agree
2. Improved my understanding of key topics	3.44	Strongly Agree
3. Made me more focused during class	3.39	Strongly Agree
4. Encouraged me to study regularly	3.21	Agree
5. Helped me retain information better	3.33	Strongly Agree
Average Weighted Mean	3.39	Strongly Agree

Table 3 presents the students' perceptions of the benefits of using the ECHO Journal in Empowerment Technology. The results show an overall average weighted mean of 3.39, interpreted as "Strongly Agree", indicating that students generally perceived the ECHO Journal as a beneficial tool. The highest-rated item was "Helped me reflect on what I learned each session" with a mean of 3.56, suggesting that the journal effectively encouraged self-reflection and consolidation of learning. Other statements such as "Improved my understanding of key topics" (3.44), "Helped me retain information better" (3.33), and "Made me more focused during class" (3.39) also received high mean scores, reinforcing the positive impact of the ECHO Journal on students' cognitive engagement and information retention. While "Encouraged me to study regularly" had a slightly lower mean of 3.21, it still falls within the "Agree" interpretation, reflecting its moderate motivational influence. Overall, the findings suggest that the ECHO Journal played a significant role in enhancing students' learning experiences and academic engagement in the subject.

Table 4. Perceived Challenges in using the ECHO Journal in Empowerment Technology

Indicators	Mean	Interpretation
1. Writing in the journal took too much time	2.11	Disagree
2. Sometimes I did not know what to write	2.45	Disagree
3. I felt unmotivated to complete the journal regularly	2.27	Disagree
4. Instructions were unclear	1.95	Strongly Disagree
5. It was difficult to connect the journal to the lesson	2.18	Disagree
Average Weighted Mean	2.19	Disagree

Table 4 illustrates the perceived challenges encountered by students in using the ECHO Journal. The average weighted mean was 2.19, interpreted as “Disagree”, indicating that students generally did not experience major difficulties with the journal. The highest challenge-related item was “Sometimes I did not know what to write” (mean = 2.45), followed by “I felt unmotivated to complete the journal regularly” (2.27), suggesting occasional uncertainty and motivational issues. However, these still fall within the “Disagree” category, implying that such issues were not widespread. Other concerns such as “Writing in the journal took too much time” (2.11), “It was difficult to connect the journal to the lesson” (2.18), and “Instructions were unclear” (1.95) received even lower mean scores, with the latter falling under “Strongly Disagree.” This reflects that the journal was generally user-friendly, well-aligned with the lessons, and manageable in terms of workload. These results demonstrate that while minor challenges existed, they were not significant enough to hinder the journal’s implementation or its overall effectiveness.

Table 5. Post-Test Results in Most Essential Learning Competencies in Empowerment Technology Subject

Topic	MELC Code	Mean Score	% Score	Interpretation
1. ICT concepts and applications	E11/12-Ia-CT-1	11.2 / 15	74.7%	Moderate Mastery
2. Online safety, security, and ethics	E11/12-Ib-CT-2	10.8 / 15	72.0%	Moderate Mastery
3. Productivity tools (e.g., word processing)	E11/12-Ic-CT-3	12.4 / 15	82.7%	High Mastery
4. Online collaboration tools	E11/12-Id-CT-4	11.6 / 15	77.3%	High Mastery
5. Designing ICT projects for social change	E11/12-Ie-CT-5	9.9 / 15	66.0%	Moderate Mastery

Table 5 presents the post-test performance of the 143 Grade 11 students after the implementation of the ECHO Journal, showing noticeable improvement across all five Most Essential Learning Competencies (MELCs) in Empowerment Technology. The topic “Productivity tools (e.g., word processing)” achieved the highest mean score of 12.4 out of 15 (82.7%), interpreted as High Mastery, indicating that students significantly enhanced their practical skills in using digital productivity applications. Similarly, “Online collaboration tools” garnered a mean score of 11.6 (77.3%), also classified under High Mastery, reflecting increased familiarity and competence in using digital platforms for teamwork and communication. Other topics such as “ICT concepts and applications” (74.7%), “Online safety, security, and ethics” (72.0%), and “Designing ICT projects for social change” (66.0%) all registered Moderate Mastery, yet showed strong gains compared to the pre-test results, where these same topics previously fell under low or very low

mastery levels. In particular, “Designing ICT projects for social change” improved from 32.7% in the pre-test to 66.0% in the post-test, marking the most significant growth. These results suggest that the use of the ECHO Journal effectively supported students’ reflection, knowledge retention, and understanding of key Empowerment Technology topics, thereby contributing to a meaningful reduction in learning loss.

Table 6. Paired Sample t-Test: Pre-Test vs. Post-Test Scores

Test	Mean Score	Standard Deviation	t-Value	p-Value	Interpretation
Pre-Test	6.1 / 15	1.45	21.37	0.000	Significant Difference
Post-Test	11.2 / 15	1.72			

Level of Significance: $\alpha=0.05$

Table 6 presents the results of the paired sample t-test conducted to determine whether there was a statistically significant difference between the students’ performance in the pre-test and post-test after the implementation of the ECHO Journal. The pre-test yielded a mean score of 6.1 out of 15 with a standard deviation of 1.45, while the post-test resulted in a significantly higher mean score of 11.2 out of 15 with a standard deviation of 1.72. The computed t-value is 21.37 and the p-value is 0.000, which is well below the set significance level of $\alpha = 0.05$. This indicates a statistically significant difference between the two sets of scores. The results confirm that students showed marked improvement in their mastery of Empowerment Technology topics following the use of the ECHO Journal. Therefore, the findings suggest that the ECHO Journal was an effective intervention tool in reducing learning loss and enhancing student learning outcomes in the subject.

CONCLUSION AND FUTURE WORKS

The findings of this study demonstrate that the ECHO (End-of-Class-Hurdle) Journal is an effective intervention in reducing learning loss and improving student performance in Empowerment Technology. Prior to its implementation, students exhibited significant learning gaps in the Most Essential Learning Competencies, with most topics falling under low or very low mastery levels. After using the ECHO Journal, students showed substantial improvement, achieving moderate to high mastery in post-test scores. This indicates that regular journaling at the end of each class served as a valuable tool for reflection, reinforcement, and knowledge retention. Additionally, students positively perceived the use of the journal, acknowledging its role in helping them focus, reflect, and better understand lessons. Minimal challenges were reported, further supporting the journal’s practicality and acceptability in the classroom setting. The statistical analysis also confirmed a significant difference between pre- and post-test scores, reinforcing the conclusion that the ECHO Journal is an effective strategy for addressing learning deficiencies in technology-based subjects.

Future research may consider implementing the ECHO Journal across various subjects and educational levels to explore its broader impact on student learning. Expanding the study to include junior high school, senior high school, and even tertiary students could provide comparative data and deeper insights into its effectiveness across different learning contexts. It is also recommended to conduct longitudinal studies to examine the long-term effects of reflective journaling on academic performance, study habits, and critical thinking skills. Incorporating qualitative data through interviews or focus group discussions could uncover more nuanced perspectives on how students and teachers experience the journal as a learning tool. Furthermore, future works may explore the development of a digital version of the ECHO Journal to increase accessibility and engagement, especially in remote or hybrid learning environments. Finally, providing professional development programs for teachers on how to effectively implement and maximize the use of ECHO Journals may enhance the consistency and quality of its integration into the curriculum.

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