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"Bridging Technical Vocational and Livelihood Module Learning Gaps on Shielded Metal Arc Welding Through Code-Switching"

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Abstract: This study investigated the effects of the project designed to bridge learning gaps in the Strengthened Technical Vocational Education Program (STVEP) - Shielded Metal Arc Welding NCII. Through the introduction of code-switched self-learning modules (SLMs), the project sought to improve learners' understanding and academic performance by reducing the difficulties technical vocabulary presents.

The study used stratified sampling to get the right number of respondents per STVEP schools.

A quasi-experimental design was used, with 79 participants. Data collection involved scores from written work (quizzes, essays, reports), performance assessments, and final examination results. Pre- and post-implementation scores were compared using a T-test to establish whether there was a significant difference.

A significant improvement in Written Work Percentage Scores was shown (M=11.229; SD=5.546; F(1,78)=-17.994, p≤.005) as well as in Performance Scores (M=-4.37848; SD=5.27115; F(1,78)=-7.383, p≤.005). Moreover, Quarterly Scores manifested more competency growth (M=90.0380; SD=2.74768). The study found that the main problem for completing a task was technical vocabulary - 91.5% of the respondents experienced this challenge. After intervention, it was shown that 92.1% of learners were more independent when performing tasks.

This suggests the effectiveness of code-switched SLMs in improving comprehension, skills acquisition, and learner autonomy. The findings, therefore, suggest that technical vocational education may have relevance for enhancement through linguistic adaptations.

Keywords: Competency-based assessment; TVL; Industry; Senior High; TESDA

I. Introduction

The COVID-19 pandemic has posed significant challenges to the Philippine education sector in disrupting its mandate to provide quality education to learners. From March 16, 2020, nationwide lockdowns caused schools to close down and thus put students' rights to education at risk. The Department of Education (DepEd) responded to this by crafting the Basic Education Learning Continuity Plan (BE-LCP), a strategic framework to ensure that learning would be continued during the crisis (DO 12, s. 2020). At the core of this plan was the introduction of the Most Essential Learning Competencies (MELCs), which streamlined 60% of the existing competencies and concentrated on enabling skills that would foster lifelong learning (Pawilen, 2020).

Although implemented, the modular distance learning modality, with 58.03 percent of learners preferring it in Quezon province, came with its challenges, especially for the Technical Vocational and Livelihood track (DepEd Quezon, 2020). Hands-on training, which comprised technical vocational and livelihood education, became impracticable with a further limitation on face-to-face activities; the learners were then left to the mercy of self-learning modules. However, gaps in modules, which included technical terminologies in English, resulted in poor understanding and further declined performance upon task execution (Glor, 2020).

This study investigates the barriers faced by TVL learners and looks at the possibility of local language intervention in improving understanding and performance regarding the aim of DepEd in equipping learners to be relevantly equipped for employment and entrepreneurship (Edillon, 2016).

The following research questions were anticipated to be answered to ensure that TVL courses were free of any language barriers, and thus to appropriately bridge the literary learning gaps found in the modules:

1. How often did TVL learners practice code-switching during the teacher-learner discussion to understand the technical terminologies and procedures stated in the modules?
2. What were the reasons why learners used code-switching in online classrooms and/or in one-on-one discussions with the teacher and co-learners?
3. How did the code-switching process help improve learners' independence in achieving the competencies in the modules?

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4. To what extent was the code-switching process enhancing the learners' level of understanding and competency development, as reflected in the results of formative and summative assessments?
5. How was the Capstone Project's intervention of developing code-switched TVL modules that addressed the literary learning gaps and improved the level of understanding and tasks performances of the learners?

II. Methods

Research Design

This study used a descriptive-evaluative survey design, which combined interviews and questionnaires (Cliff, 2018; Khamdani, 2012) to assess teacher-student interactions and identify learning barriers. Descriptive analysis, which included both quantitative and qualitative data collection, was used to document the phenomenon (Hubbard, 2016). Villanueva (2013) noted that this design is suitable for assessing varied circumstances and social aspects across diverse subjects. The study was conducted in three educational districts in Quezon province, focusing on SMAW NCII teachers, TVL department heads, students, and parents.

Sampling

A sample of 234 students was selected using proportional stratification and a 3% margin of error. A mixed-methods approach was applied, combining surveys, focus group discussions, and document reviews to gather data on code-switching's effectiveness in closing learning gaps.

Table 1. Number of Respondents per area/location

N= 410	MSEMSAT, Mauban, Quezon	BPAHS, Mulanay, Quezon	GMTISAT, San Narciso, Quezon	Total
Total No. of SMAW students, teachers parents	206	146	58	410
Sampling Fraction (in percent)	50	36	14	100
Respondents per area proportional to the toral No. of respondents	103	53	8	164

Pilot tests were done, and academic performances were compared against previous scores. The effectiveness of the intervention was assessed in order to know its contribution to enhancing students' understanding through code-switching. Developed modules were scrutinized thoroughly, reviewed, and validated for any errors and or inconsistencies.

III. Results

The study aimed to address learning gaps in the Strengthened Technical Vocational Education Program (STVEP) modules by using code-switching to aid student comprehension. Prior to the project, 95.7% of students engaged in code-switching 16-20 times per session to understand lessons. The primary reason was difficulty with technical vocabulary, as indicated by 91.5% of respondents. In response, teachers often used code-switching to help students overcome challenges with module terminologies.

92.1% of the students stated that they have become more independent in the task accomplishment. And 79 of them had greatly improved in terms of their performance in academics. Their written work improved from a mean of 68.4% to 79.6%, thus scoring above 75% that would pass the level. Also, their performance tasks and quarterly scores showed an increase from a mean of 82.6% to 87.0%. Statistical analysis confirmed significant differences ($p \leq .005$) in both written work and performance task scores, indicating that code-switching contributed positively to competency development.

Further analysis of quarterly final examination scores revealed a similar improvement, with scores rising from 85.6% to 90.0%. These results align with prior studies suggesting that code-switching enhances student understanding and engagement, ultimately bridging learning gaps and improving academic outcomes in technical vocational education..

IV. Discussion

Baseline data are always important to ground the effectiveness of any academic study, and this study on bridging learning gaps in Shielded Metal Arc Welding (SMAW) through code-switching is no exception. The researcher, in collaboration with the Division Supervisor-in-Charge, identified the need to address gaps in technical vocational education, particularly in how students engaged with the modular curriculum. Initial data revealed a significant number of unperformed tasks and unanswered self-checks, highlighting a need for intervention.

The project began by gathering perspectives from students, teachers, and parents, focusing on how code-switching could help clarify difficult technical terminology in the SMAW modules. These insights, based on firsthand experiences, informed the development of the Code-Switched modules. These modules aimed to make the technical concepts more comprehensible at a foundational level, ensuring that learners understood key terms and procedures.

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The project results revealed that 92.1% of students reported increased confidence in completing learning tasks and self-checks independently after the code-switched modules were implemented. The remainder, 7.9%, required minimal supervision, not due to a lack of understanding, but because they needed to divide attention between multiple subjects. Overall, this intervention proved effective in enhancing students' comprehension and task performance, validating the importance of incorporating respondents' feedback into curriculum development.

V. Conclusion

The findings of this study on bridging learning gaps in Shielded Metal Arc Welding (SMAW) through code-switching have demonstrated significant improvements in students' understanding and competency. By incorporating the feedback of students, teachers, and parents, the project developed Code-Switched modules that facilitated the comprehension of complex technical terminology and procedures. The results found that 92.1 percent of the respondents could independently undertake self-checking and learning independently while 7.9 percent did with close monitoring, giving evidence of a positive effect from code-switching for enhancing students' learning independence. It is supported by the view that code-switching is effective for improving students' comprehension especially during technical learning as they learn technical terms in English. In addition, the engagement of learners and parents in the development process created a sense of ownership and contributed to the overall success of the project. This intervention points out the necessity of adaptive teaching strategies to cater to diverse learning needs in technical-vocational education.

VI. Recommendation

Based on the results, future technical-vocational education modules should have code-switching as a frequent teaching method especially in areas where students come from diverse linguistic backgrounds. This method supports Narasuman (2013) and Abad (2010), who argue that code-switching helps the learners better understand complex concepts. The more visual and illustrative, respondents further added, will make the learning process easier. Further research will include the long-term effects of code-switching on student performance across different technical programs and potential incorporation into other subjects to create more general engagement in learning (Yao, 2011).

Acknowledgement

The researcher would like to extend very sincere thanks to the Division of Quezon Province's Strengthened Technical Vocational Education Program (STVEP) for its support in implementing this Capstone Project. Special appreciation goes to the teachers, students, and parents who were eager to share their insights and experiences, providing valuable input that shaped this study. Appreciation is also extended to the DepEd quality assurance team for guiding the validation of code-switched modules. Finally, heartfelt thanks to the DAP Scholar for their dedication and leadership, and to all those who contributed to the success of this project. Your collective efforts made this study possible. To my family, you made me stronger than ever. To God be the highest glory.

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FIGURES

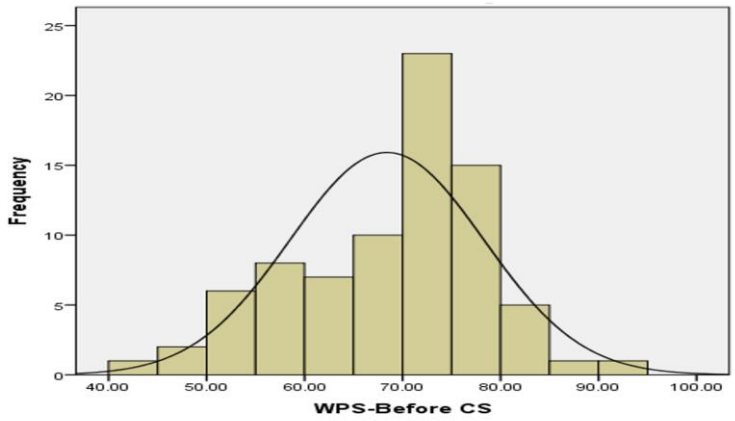


Figure 1. Written Works Percentage Scores of SMAW students before Code-Switching Project

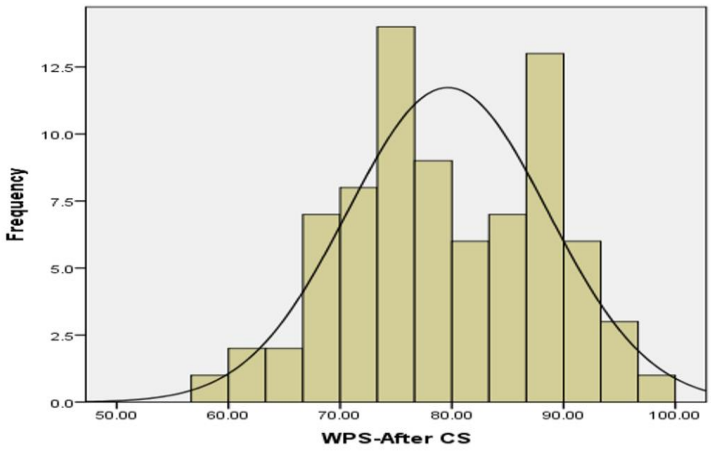


Figure 2. Written Works Percentage Scores of SMAW students after Code-Switching Project

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	WPS-Before CS - WPS-After CS	68.4032 79.6320 -11.229	5.546	.624	-12.471	-9.987	-17.994	78	.000

Figure 3. Mean Scores on Written Works Percentage Scores before and after the Project Implementation

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PPS-Before CS - PPS-After CS	82.6291 87.0076 -4.37848	5.27115	.59305	-5.55915	-3.19781	-7.383	78	.000

Figure 4. Mean Scores on Performance Percentage Scores before and after the Project Implementation