Strengthening Vocational Education: Analyzing the Match between TVL Courses and Teachers' Specializations

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Abstracts: The implementation of the K to 12 programs in the Philippines has significantly expanded vocational education opportunities for students, aiming to enhance their future prospects. However, the issue of teacher-subject mismatch, particularly in TVL (Technical-Vocational-Livelihood) courses, has emerged as a significant challenge affecting teachers, students, implementers, and other stakeholders. This research investigates the prevalence of teacher-subject mismatch in Senior High Schools offering TVL subjects in Agusan del Sur, Philippines. Utilizing qualitative data collection and thematic analysis, four key themes were identified: Qualifications of TVL Teachers, Existence of Teacher-Subject Mismatch, Impact of Teacher-Subject Mismatch, and Policy Enhancement for Teacher-Subject Alignment. Despite possessing qualifications, TVL teachers perceive a concerning presence of teacher-subject mismatch in their schools. Based on the respondents' perspectives analyzed in this study, policy improvements are recommended to address the issue of teacher-subject mismatch in vocational education.

Keywords: K to 12 programs, Vocational education, Teacher-subject mismatch, Technical-Vocational-Livelihood.

1. INTRODUCTION

Vocational education plays a vital role in equipping individuals with the necessary skills and knowledge to meet the demands of the ever-evolving job market (Organization for Economic Cooperation and Development, 2019). In recent years, Technical-Vocational-Livelihood (TVL) courses have gained prominence as an effective pathway for students to acquire practical skills and competencies aligned with specific industries (Sato & Schamp, 2018). However, the success of vocational education depends not only on the curriculum and resources but also on the expertise and specialization of the teachers delivering these courses. This study aims to explore the match between TVL courses and teachers' specializations to understand the implications for strengthening vocational education.

Vocational education is recognized globally as a significant contributor to economic development, social mobility, and addressing skills gaps (UNESCO, 2017). As industries become more specialized and technology-driven, the demand for skilled professionals with vocational training continues to grow. TVL courses provide students with hands-on experience and knowledge in specific industries such as agriculture, automotive, information and communications technology, and culinary arts, among others. These courses aim to bridge the gap between theory and practice, preparing students for the workforce or further education in their chosen fields.

Teachers play a crucial role in the delivery of vocational education. Their expertise, experience, and specialization significantly impact the quality and effectiveness of the training provided to students. Effective vocational teachers possess a deep understanding of industry-specific practices, technologies, and standards. They are not only educators but also mentors and facilitators, guiding students in developing practical skills, problem-solving abilities, and a professional work ethic.

A key factor in the success of vocational education is the alignment between TVL courses and teachers' specializations. When teachers have expertise and professional experience directly related to the subjects they teach, it enhances the overall learning experience for students. Research has shown that teachers who specialize in specific vocational areas have a deeper understanding of industry needs, emerging trends, and best practices. This understanding allows them to provide relevant and up-to-date instruction, ensuring that students acquire the necessary skills and knowledge required by employers.

Conversely, when teachers lack specialization in the subjects they teach, there can be a mismatch between the curriculum and industry demands. Students may not receive adequate exposure to the latest tools, technologies, and techniques used in their chosen fields. This mismatch may hinder their ability to transition smoothly into the workforce or pursue further education. Therefore, it is crucial to examine the match between TVL courses and teachers' specializations to identify potential gaps and areas for improvement.

Analyzing the match between TVL courses and teachers' specializations has several implications for strengthening vocational education. First, it helps identify areas where additional professional development or training may be necessary for teachers. Professional development programs can enhance teachers' subject-specific knowledge and skills, ensuring they stay updated with industry advancements. Additionally, providing opportunities for teachers to engage in industry partnerships, internships, or work placements can further strengthen their understanding of real-world applications and industry needs.

Second, understanding the match between courses and specializations can inform curriculum development and refinement. Curriculum designers can collaborate with industry experts and teachers with specialized knowledge to ensure the inclusion of relevant and industry-aligned content. This collaboration facilitates the creation of comprehensive and up-to-date curriculum frameworks that equip students with the skills, competencies, and certifications required for their chosen vocational fields.

Vocational education is an essential component of preparing individuals for the workforce, and the specialization of teachers within TVL courses plays a critical role in its effectiveness. Matching TVL courses with teachers' specializations is vital for ensuring that students receive instruction that is relevant, industry-aligned, and responsive to emerging trends. By strengthening the match between courses and specializations, vocational education can better equip students with the skills and knowledge needed to succeed in their chosen fields. This study aims to delve into the topic further, analyzing the current state of the match between TVL courses and teachers' specializations and providing insights for enhancing vocational education in the future.

2. THEORETICAL FRAMEWORK

This study is anchored in two main theories: the Theory of Vocational Expertise and the Curriculum-Industry Alignment Theory. The Theory of Vocational Expertise emphasizes the significance of teachers' specialized knowledge and professional experience in vocational education (Eraut, 2000). According to this theory, teachers who possess deep expertise in specific vocational areas are better equipped to provide relevant and up-to-date instruction to students, ensuring they acquire the necessary skills demanded by industries. This theory supports the hypothesis that a strong match between TVL courses and teachers' specializations positively impacts vocational education outcomes.

The Curriculum-Industry Alignment Theory focuses on the importance of aligning educational curricula with industry needs and standards (Schneider, 2000). This theory suggests that a close alignment between TVL courses and industry demands enhances the relevance and effectiveness of vocational education. It argues that involving industry experts and specialized teachers in curriculum development ensures the inclusion of industry-aligned content and facilitates students' transition into the workforce. These theories provide a theoretical framework for understanding the relationship between TVL courses, teachers' specializations, and the overall strength of vocational education.

3. METHODS

This study utilized a mixed-methods research design to comprehensively analyze the match between TVL courses and teachers' specializations in vocational education. A representative sample of TVL teachers from senior high schools was selected. Data collection involves the use of structured surveys administered to the teachers to gather quantitative data on their age, gender, teacher position, professional experience, specialization, and perceptions of the match between their specializations and the TVL courses they teach. Additionally, in-depth interviews are conducted with a subset of teachers to obtain qualitative data on their perspectives, challenges, and

recommendations regarding the alignment of courses and specializations. Quantitative data are analyzed using appropriate statistical tools to calculate descriptive statistics, while qualitative data undergo transcription, coding, and thematic analysis. The findings from both methods are triangulated to provide a comprehensive understanding of the match between courses and specializations. Ethical considerations, including informed consent, confidentiality, and anonymity, are observed throughout the study. By employing this mixed-methods approach, the study aims to capture a holistic picture of the match between TVL courses and teachers' specializations in vocational education.

4. RESULTS

This section presents the results and discussions of the study, which aimed to strengthen vocational education by analyzing the match between TVL courses and teachers' specializations.

Table 1 presents the distribution of participant profiles in terms of age, gender, teacher position, and professional years of experience.

Table 1. Distribution of the profiles of participants

Respondent	Age	Gender	Teacher Position	Professional Years of Experience
1	44	Male	Teacher III	21
2	42	Female	Teacher III	20
3	32	Male	Teacher I	4
4	51	Male	Teacher II	29
5	31	Male	Teacher I	6

The study includes participants of varying ages, with the youngest being 31 years old and the oldest being 51. The participants primarily consist of males, with only one female participant. The teacher positions vary among the participants, with three classifieds as Teacher III, one as Teacher II, and one as Teacher I. Furthermore, the participants' professional years of experience range from 4 to 29 years. The diverse age range and distribution of teacher positions indicate a mixture of experienced and less-experienced teachers in the study. However, it is important to note the gender imbalance in the sample, as most participants are male. The varying years of experience among the participants suggest differences in expertise and knowledge levels, which may contribute to variations in teaching practices and perspectives.

4.1. Teacher Qualifications and Degree Specializations

In addressing the questions for problem number two (2), the data presented below highlights the qualifications and degree specializations of the respondents. The responses indicate that respondent number two (2) is qualified to teach TVL courses as she has completed relevant training and obtained National Certificates II (NCII). On the other hand, respondent number one (1) does not possess the qualifications to handle TVL subjects, as the data shows a lack of training or specialization in that area. Lastly, respondent number five (5) is also qualified to teach TVL courses as he has undergone training and obtained National Certificates II (NCII).

Item Number 1: Teacher Qualifications for Teaching TVL

Respondent number one (1) holds a Bachelor of Secondary Education degree majoring in Mathematics and has completed the academic requirements for a Master of Arts in Mathematics (CAR). However, the respondent does not possess a specific degree of specialization that qualifies them to teach TVL courses.

Respondent number two (2) graduated with a Bachelor of Secondary Education degree majoring in T.H.E (Technology and Home Economics) and has completed the academic requirements for a Master of Arts in Teaching Home Economics (CAR). Additionally, they hold a Cookery NC II certification and have completed Training Methodology One (TM1). These qualifications demonstrate that respondent number two is adequately qualified to teach TVL courses.

Respondent number three (3) holds an NCII-SMAW (Shielded Metal Arc Welding) certification, which serves as their credential for teaching Shielded Metal Arc Welding NC1.

Respondent number four (4) has obtained National Certificates II in Electronic Product Assembly (EPAS), a Trainer Certificate, and Trainers Methodology. However, these trainings do not qualify them to teach Shielded Metal Arc Welding NC1.

Respondent number five (5) graduated with a Bachelor of Science in Information Technology and has completed the academic requirements for a Master of Science in Information Technology (unit earner). They also hold certifications in Computer System Servicing NC II, Visual Graphic Design NC III, and Computer Programming NC IV. These qualifications establish that respondent number five is qualified to teach TVL courses.

Item Number 2: Teacher Qualifications for Teaching General SHS Subjects

Respondent number one (1) holds a Bachelor of Secondary Education degree majoring in Mathematics and has completed the academic requirements for a Master of Arts in Mathematics (CAR). This qualifies respondent number one to teach general Senior High School (SHS) subjects according to the qualification standards set by the Department of Education.

Respondent number two (2) graduated with a Bachelor of Secondary Education degree majoring in T.H.E (Technology and Home Economics) and has completed the academic requirements for a Master of Arts in Teaching Home Economics (CAR). Additionally, they hold a Cookery NC II certification and have completed Training Methodology One (TM1). These qualifications meet the standard requirements established by the Department of Education, making respondent number two eligible to teach general SHS subjects.

Respondent number three (3) holds a Bachelor of Science in Computer Science degree and possesses certifications in Videographic Design NCII, Computer Hardware Services NC II, and Shielded Metal Arc Welding NCII. These qualifications adequately prepare respondent number three to teach Senior High School students.

Respondent number four (4) graduated with a Bachelor of Science in Industrial Education majoring in Electronic Technology. This qualification enables respondent number four to teach general subjects in Senior High School.

Respondent number five (5) graduated with a Bachelor of Science in Information Technology and has completed the academic requirements for a Master of Science in Information Technology (unit earner). They also hold certifications in Computer System Servicing NC II, Visual Graphic Design NC III, and Computer Programming NC IV. These qualifications meet the standard requirements set by the Department of Education, making respondent number five qualified to teach general SHS subjects.

Item Number 3: Specialized TVL Subjects for TVL Teachers

Respondent number one (1) is assigned to teach Carpentry under the Industrial Arts strand to grades 11 and 12, despite not having the specific qualifications for teaching carpentry. The basis for this assignment seems to be the respondent's personal experience and initiatives rather than formal qualifications.

Respondent number two (2) teaches TVL subjects such as Cookery, Bread and Pastry, and Food and Beverages Services under the Home Economics strand. This respondent holds the necessary qualifications to teach these subjects, as they have expertise in the field and possess an NC II certification in the respective courses.

Respondent number three (3) teaches Shielded Metal Arc Welding NC I. This indicates that the respondent is qualified to teach Shielded Metal Arc Welding under the TVL track.

Respondent number four (4) teaches Shielded Metal Arc Welding (SMAW) within the TVL track. While the specific qualifications are not mentioned, it can be inferred that the respondent possesses the necessary expertise and qualifications to teach this subject.

Respondent number five (5) teaches TVL subjects such as Computer System Servicing under the ICT strand. This respondent has the qualifications to teach Computer System Servicing, as they possess the required expertise and hold NC II, III, and IV certifications in the relevant courses.

4.2. Perceptions of TVL Teachers on Teacher-Subject Alignment

Respondent number one (1) expresses the belief that no quality education or competency is delivered to students when there is a lack of qualification and expertise in teaching specific TVL subjects. This implies that respondent number one acknowledges their own limited knowledge and skills in the subject they are teaching.

Respondent number two (2) states that in their case, there is no qualification mismatch between the teacher and the subjects they are handling. This suggests that respondent number two's expertise and specialization align with the subjects they teach.

Respondent number three (3) highlights compromised learning of specific concepts due to a lack of teaching personnel in our school. Teachers are assigned subjects that may not align with their specialization, resulting in compromised learning experiences for students.

Respondent number four (4) emphasizes the need for teachers to exert extra effort in learning practical subjects to become effective teachers in senior high school. They also mention that students may experience a learning gap if teachers are not adequately prepared to teach practical subjects.

Respondent number five (5) acknowledges the existence of a teacher-subject mismatch problem among TVL courses in the SHS Department of our school. This issue is attributed to a lack of specialized teachers and insufficient training for the teachers in those specific courses.

4.3. Recommended Policy Improvements for Teacher-Subject Alignment

Respondent number one (1) proposes that teachers in the Senior High School department should be given the opportunity to study and undergo training funded by the Department of Education (DepEd). They suggest establishing a joint working group with the Technical Education and Skills Development Authority (TESDA) to ensure the provision of quality teacher education and teaching that aligns with the skills and competencies required in the TVL track.

Respondent number two (2) recommends that the hiring process for Senior High School teachers should prioritize specific capacities and qualifications, particularly aligning with the academic strand offered by the school. They emphasize the importance of recognizing teaching as a full profession that requires specialized training in both subject matter and pedagogy to ensure alignment between teachers' expertise and the learning and teaching process.

Respondent number three (3) suggests the need for additional qualified teachers to teach TVL subjects at DLMNHS. They emphasize the importance of adhering to teachers' qualification standards to ensure that qualified teachers are assigned to teach TVL courses.

Respondent number four (4) recommends implementing a proper mapping system between TVL offerings and teacher assignments. This would ensure that teachers are assigned to subjects aligned with their specialization, as it significantly impacts the teaching and learning process.

Respondent number five (5) highlights the importance of training teachers and employing individuals who are experts in specific TVL specializations. They propose that the Department of Education should prioritize providing training opportunities and ensuring the employment of teachers with expertise in TVL tracks.

4.4. Thematic Analysis of Responses of Respondents

To further elaborate and discuss the qualitative data gathered from the respondents, this section provides a thematic analysis of the responses using a thematic diagram based on each item. Since a thematic analysis requires codes for better understanding, the following terms and legends are utilized:

Qualifications = qlfns

Qualified = qlfd

Not qualified = nqlfd

Perceptions = pcns

There is teacher-subject mismatch = tsmch

There is no teacher-subject mismatch = ntsmch

Policy Improvement = polimp

Theme 1: Qualifications to teach TVL Subjects	**Theme 2: Presence of Teacher-Subject Mismatch**	**Theme 3: Effects of Teacher-Subject Alignment**	**Theme 4: Improvement of Teacher-Subject Alignment**
Codes: Qlfd Nqlfd Qlfns are not aligned Qlfns are aligned Qlfd for General	**Codes:** Tsmch Ntsmch Qlfns are not aligned. Qlfns are aligned	**Codes:** Ntsmch, pcns say no effects. Tsmch, pcns say there are effects Tsmch results to a lesser quality of education Tsmch results to compromised learning for	**Codes:** Tsmch, pcns say need for polimp through teacher training Tsmch, pcns say need for polimp through qualification standard adherence and appropriate teacher-qualification mapping Tsmch, pcns say need for polimp through additional

Subjects only Qlfd to teach TVL Subjects		particular concepts. Tsmch results to half-baked students and learning gap	teachers

The thematic diagram presented in the table above presents the thematic analysis of the responses from the five respondents in this research study. The themes are based on the concepts or ideas explored in the survey questionnaire.

Under Theme 1: Qualifications to Teach TVL Subjects, six codes are listed, representing the combined and saturated responses regarding the qualifications of the respondents to teach TVL subjects. Respondents 1 and 4 are not qualified, as their qualifications do not align with the TVL subjects. On the other hand, respondents 2, 3, and 5 demonstrate qualifications that align with the TVL subjects.

Under Theme 2: Presence of Teacher-Subject Mismatch, four codes are listed. The responses of respondents 1 and 4, who lack qualifications for TVL subjects, emphasize the presence of a mismatch between the teacher and the subject. Conversely, respondents 2, 3, and 5, who possess the appropriate qualifications, state that there is no mismatch between the teacher and the subject.

The varying responses of the respondents indicate differences in qualifications and the presence of teacher-subject mismatch. The existence of teacher-subject mismatch is supported by previous research studies by Ferrer (2022), Manlangit (2022), Caraig (2022), Dacanay, Oracion, and Base (2020), Almerino et al. (2020), and Naelgas and Malonisio (2022), which found that this problem exists among SHS courses, particularly in TVL subjects.

Under Theme 3: Effects of Teacher-Subject Alignment, three codes are listed. Respondent 2, who is qualified, states that there are no effects of teacher-subject mismatch since it does not exist. However, respondents 3 and 5, despite being qualified, share similar perceptions on the potential effects of teacher-subject mismatch with respondents 1 and 4, who are not qualified. These perceptions include a negative impact on the quality of education, students' competence, and the presence of a learning gap. This perception aligns with the findings of a study conducted by Datingaling (2019), which highlighted the effects of teacher-subject mismatch on the curriculum and student learning.

Under Theme 4: Improvement of Teacher-Subject Alignment, two codes are listed. Although three out of the five respondents are qualified to teach TVL subjects, all respondents provided recommendations on how to address teacher-subject mismatch. These recommendations include appropriate mapping of teacher qualifications, strict adherence to qualification standards for TVL teachers, the addition of qualified teachers, and the provision of training programs for teachers experiencing a mismatch.

These recommendations are supported by the findings of Sumalinog et al. (2022), which emphasize the importance of teacher-subject alignment in the performance of students. The study highlights the need for teachers to have high proficiency levels and appropriate qualifications in teaching specific subjects, such as Electrical Technology.

There are recurring codes between Theme 1 and Theme 2 and between Theme 3 and Theme 4, indicating a correlational pattern between the themes. Respondents 1 and 4, who lack qualifications, perceive a mismatch between the teacher and the subject, which in turn affects student and teacher performance. They also emphasize the need for policy improvements. Additionally, respondents 1 and 2 assert that policy improvements should focus on increasing the training and qualifications of teachers, which aligns with the recommendations outlined in the DepEd Bulletin regarding the completion of National Certificate II (NCII) and Training Methodology Levels (TM). Conversely, the recurrence of codes between the third and fourth themes is minimal, as qualified teachers share similar perceptions regarding the effects of teacher-subject mismatch and policy improvements for teacher-subject alignment.

CONCLUSIONS

Based on the research study findings, several conclusions were drawn by the researchers. Firstly, the respondents were found to be diverse in terms of gender and age, indicating a heterogeneous sample. Secondly, the respondents were identified as qualified teachers based on their teaching positions and years of experience in the field. In terms of teacher-subject alignment, two respondents reported experiencing a mismatch between their assigned subjects and their expertise, while the other three demonstrated appropriate alignment between their teaching assignments and subject knowledge.

Additionally, four out of the five respondents expressed concerns about the detrimental effects of teacher-subject mismatches, such as lower-quality education, learning gaps, and decreased student competence. Lastly, all respondents recommended policy improvements, including the implementation of proper teacher assignment mapping, strict adherence to qualification standards, and the provision of training programs for teachers. These conclusions shed light on the importance of addressing teacher-subject alignment issues to ensure the delivery of high-quality education and enhance student outcomes.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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