Left With No Choice: Experiences of Technical-Vocational Senior High School Graduates Pursuing Engineering Programs

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ABSTRACT

This study explored the lived experiences of Technical-Vocational-Livelihood (TVL) Senior High School (SHS) graduates who pursued engineering programs at Samar State University. Anchored in a transcendental phenomenological design, the research employed in-depth interviews with purposively selected participants from public SHSs in the Schools Division of Samar. Colaizzi's method guided the data analysis, ensuring rigor through transcription, coding, theme clustering, and validation via member checking. Six major themes emerged: (1) factors influencing the choice of the TVL track, (2) motivations for enrolling in engineering, (3) shifts in understanding of engineering before and after enrollment, (4) meaningful learning experiences, (5) emotional responses to coursework, and (6) alignment or mismatch between SHS preparation and college engineering demands. Findings revealed that while the TVL track offered practical training and immediate employability, it provided limited grounding in mathematics and science—critical competencies in engineering education. Despite this gap, students exhibited resilience, resourcefulness, and growth, drawing strength from personal motivation, peer networks, and institutional support systems. Their narratives underscored both the challenges of transitioning from skillbased training to theory-intensive coursework and the fulfillment derived from overcoming such hurdles. The study concludes that TVL preparation remains misaligned with the theoretical rigor of engineering programs and recommends a strengthened career guidance system, enhanced alignment of SHS tracks with higher education, and multisectoral collaboration to inform policy and practice. By amplifying the voices of rural learners, this research contributes to ongoing discourse on educational reforms and the pursuit of equitable, responsive pathways to higher education.

Keywords: Technical-Vocational-Livelihood (TVL), engineering education, transcendental phenomenology, student experiences, track alignment

INTRODUCTION

Engineering education has increasingly emphasized equipping students with core knowledge in STEM (Science, Technology, Engineering, and Mathematics), numeracy, and literacy to meet the high demand for skilled engineers in the twenty-first century. Globally, engineering education now prioritizes the development of 21st century skills, including communication, collaboration, critical thinking, metacognition, autonomy, entrepreneurship, and ICT and digital literacy (Joynes et al., 2019). To address these needs, curriculum writers and educators have continuously updated learning resources and programs to ensure graduates acquire essential professional competencies prior to employment (Fomunyam, 2020).

Despite these improvements, a persistent challenge in engineering education is the alignment between secondary technical-vocational preparation and tertiary-level requirements. Technical and vocational education plays a critical role in developing human capital by providing students with practical skills that support success in higher education and meet labor market demands (Sibiya & Nyembezi, 2018). In the Philippines, the Enhanced Basic Education Act (Republic Act No. 10533, 2013) introduced the Senior High School (SHS) program, which added Grades 11 and 12 to the basic education curriculum. Launched in 2016, SHS aims to foster holistic development, equip students with 21st century skills, and prepare them for higher education, entrepreneurship, or employment (Ramos, 2021).

The Technical-Vocational Livelihood (TVL) track of SHS provides students with technical skills and academic knowledge to address both community and global workforce needs (Brillantes et al., 2019, cited in Ramos, 2021). TVL strands in automotive, construction, electronics, furniture and fixture, metal and engineering, and ICT are considered most relevant for students intending to pursue Engineering courses in college. However, the country continues to face a shortage of STEM graduates. CHED reported a national STEM completion rate of only 21.10%, with Engineering at 18.97% as of 2016-2017 (Rafanan et al., 2020).

While the SHS program offers work immersion and practical exposure to enhance readiness for tertiary education (DepEd Order No. 30, Series of 2017), students frequently face challenges in aligning their senior high school strands with college courses. Factors such as exam cutoffs, availability of courses, and socioeconomic constraints often force students to enroll in programs unrelated to their SHS specialization (Santos et al., 2019).

Given these realities, this study explored the experiences of SHS-TVL graduates in the Schools Division of Samar who pursued Engineering courses. The research aimed to understand how secondary technical-vocational preparation influenced their college experiences and to highlight the importance of aligning SHS tracks with higher education aspirations

METHODOLOGY

Research Design

This study employed a transcendental phenomenological design, a qualitative research approach focused on exploring and understanding the lived experiences of participants from their own perspectives. Transcendental phenomenology, as described by Moustakas (1994), emphasizes capturing the essence of experiences by setting aside the researcher's preconceptions—a process known as epoche or bracketing—to ensure the findings reflect participants' authentic voices.

This design was particularly suited for the study because it allowed an in-depth exploration of how TVL-SHS graduates perceive and navigate the transition from technical-vocational secondary education to tertiary-level Engineering courses. The primary focus was on understanding the graduates' subjective experiences, including their perceptions of preparedness, challenges encountered, and strategies employed to succeed in their Engineering programs. By emphasizing the participants' own accounts, transcendental phenomenology provides rich, nuanced insights that might be overlooked in quantitative or purely descriptive approaches.

The choice of this design aligns with the study's aim to document and interpret the essence of the graduates' experiences rather than measure outcomes or test hypotheses. It facilitated a comprehensive understanding of complex phenomena such as the alignment—or misalignment—between SHS-TVL tracks and college-level Engineering courses, the relevance of technical skills acquired in SHS, and the personal, academic, and social challenges experienced in higher education.

Furthermore, the transcendental phenomenological design supports the use of in-depth, semi-structured interviews, enabling participants to express their perspectives freely in their own language and at their own pace. This approach ensures that the data collected are not filtered through the researcher's assumptions, but rather reflect the genuine lived experiences of TVL-SHS graduates, providing a strong foundation for the study's findings and recommendations.

Participants

The study involved graduates of the Technical-Vocational and Livelihood (TVL) track in Senior High School (SHS) who pursued Engineering courses at Samar State University, Catbalogan City, during School Years 2018–2020. Participants were purposely selected to provide rich, relevant insights into the experiences of SHS-TVL graduates transitioning to tertiary-level engineering programs.

The participants consisted of fourth-year Engineering students from various strands within the TVL track, such as ICT, Electrical Installation and Maintenance, and Computer Programming. They were enrolled in diverse Engineering programs, including Civil, Electrical, and Computer Engineering, which allowed the study to capture a broad spectrum of experiences across both aligned and non-aligned SHS strands.

Selection was guided by specific inclusion criteria to ensure participants could meaningfully contribute to the study: they had to have completed the TVL track in any public secondary school within the Schools Division of Samar, be officially enrolled at SSU in an Engineering program, and willingly consent to participate. Additionally, students who had left their Engineering program but had completed at least two years of study were also included, as their perspectives provided valuable insight into the challenges faced during the transition from SHS to college-level Engineering courses.

The participants' experiences reflect both the opportunities and difficulties encountered by TVL-SHS graduates in accessing higher education in Engineering, offering a nuanced understanding of how strand selection, academic preparation, and personal circumstances intersect to shape their academic journey. By focusing on this specific group, the study ensures the relevance and credibility of its findings for understanding the broader issue of SHS strand alignment with college courses in the Philippine context

Data Gathering Procedure

Data for this study were collected through in-depth, semi-structured interviews, the primary method used in transcendental phenomenological research to capture participants' lived experiences in detail. This approach allowed the researcher to explore the subjective perspectives of TVL-SHS graduates on their transition from technical-vocational senior high school to Engineering courses at Samar State University, focusing on both academic and personal experiences.

Before the interviews were conducted, ethical approval and institutional consent were obtained. Permission was secured from the university authorities, and participants provided written informed consent, emphasizing voluntary participation, confidentiality, and the right to withdraw at any time. The consent process included a clear explanation of the study's objectives, data handling procedures, and assurances that participants' narratives would be used solely for research purposes.

Interviews were conducted one-on-one and face-to-face on campus. Conducting interviews individually ensured a safe and private environment, encouraging participants to share candid reflections on their experiences without peer influence or social pressure. The researcher used open-ended questions to facilitate detailed responses, allowing participants to recount their experiences in their own words and in their native language. No strict time limit was imposed, giving participants sufficient opportunity to reflect and elaborate on their experiences.

All interviews were audio recorded with participants' permission to ensure accurate capture of narratives, nonverbal cues, and contextual details. Immediately after each interview, the researcher transcribed the recordings verbatim and made reflective notes to document emotional expressions, hesitations, and other observations that provided additional context to the participants' accounts. This process enabled the researcher to preserve the authenticity and richness of the participants' lived experiences, which is central to transcendental phenomenological research.

The data collection process was iterative, with the researcher probing further when clarification was needed and encouraging participants to expand on their experiences. This approach not only ensured that the narratives were comprehensive and detailed, but also enhanced the trustworthiness of the data by allowing participants' perspectives to be fully expressed before moving to the analysis stage

Data Analysis Procedure

The data collected through in-depth interviews were analyzed using Colaizzi's (1978) seven-step method, a widely recognized approach in transcendental phenomenological research for providing a systematic and rigorous analysis of participants' lived experiences. This method was particularly suitable because it emphasizes

capturing the essence of experiences directly from participants' narratives while maintaining fidelity to their perspectives.

The analysis began with familiarization, where the researcher repeatedly read the transcribed interviews and reviewed reflective notes to gain a comprehensive understanding of the participants' accounts. This step allowed the researcher to immerse in the data and appreciate the full context of the experiences described.

Next, significant statements related to the phenomenon under investigation were identified. These statements were directly extracted from participants' narratives and represented experiences, perceptions, or challenges relevant to pursuing Engineering courses after completing SHS-TVL.

In the formulation of meanings stage, the researcher interpreted the significant statements while practicing epoche (bracketing), setting aside personal assumptions and prior knowledge to ensure that the meanings emerged authentically from the participants' perspectives.

The clustering of themes involved organizing the formulated meanings into broader categories that captured patterns or commonalities across participants' experiences. Themes were reviewed iteratively to ensure they accurately reflected the participants' accounts without distortion or over-interpretation.

Following this, an exhaustive description of the phenomenon was developed, providing a detailed narrative that integrated all themes and highlighted the complexity and richness of the participants' experiences. This description was then condensed into a fundamental structure, a concise synthesis capturing the core essence of the phenomenon while retaining the most significant insights.

Finally, the validation of findings was conducted by returning the fundamental structure to participants to confirm that the analysis accurately represented their experiences. This step ensured credibility and enhanced the trustworthiness of the findings.

Overall, Colaizzi's method provided a transparent and systematic approach to transform raw interview data into meaningful themes while ensuring that the participants' voices remained central to the interpretation. By using this method, the study was able to capture both the depth and diversity of experiences of SHS-TVL graduates navigating Engineering courses, offering insights into the relevance of their SHS preparation and the challenges they encountered in higher education.

Ethical Considerations

Given the sensitive nature of exploring personal experiences, the study was conducted in strict adherence to ethical research principles to ensure the protection, respect, and rights of all participants. Prior to data collection, formal approval was secured from the Samar State University administration, and the study protocol was submitted to the Ethics Review Committee (ERC) for review and clearance. This ensured that the research design and procedures conformed to institutional, national, and international standards for ethical research.

Participation in the study was entirely voluntary, and each participant provided written informed consent prior to the interviews. The consent process involved a thorough explanation of the study's purpose, the data collection procedures, potential risks and benefits, and the voluntary nature of participation. Participants were informed that they could withdraw from the study at any time without any consequences to their academic standing or relationship with the university.

To protect confidentiality and privacy, all interviews were conducted in a private setting. The researcher ensured that no unauthorized individuals were present during the interviews. Participants' identities were anonymized in all transcripts, reflective notes, and final reports, and any identifying information was removed to prevent traceability. Audio recordings were securely stored and accessible only to the researcher.

The researcher also observed cultural sensitivity and emotional care throughout the interviews. Given that participants shared personal reflections on academic struggles, financial challenges, and adjustment difficulties,

care was taken to create a supportive environment where participants could express themselves freely. No leading questions or coercive techniques were used; instead, open-ended prompts encouraged authentic narratives in participants' preferred language.

Finally, the researcher-maintained reflexivity to prevent personal biases from influencing data interpretation. All transcriptions and thematic analyses were reviewed for accuracy, and participants were given the opportunity to validate the findings to ensure that their experiences were represented truthfully. By observing these ethical safeguards, the study not only complied with legal and institutional requirements but also promoted trustworthiness, respect, and integrity in the research process.

RESULTS AND DISCUSSION

Theme 1 - Factors Affecting TVL Track Choice for Senior High School

The participants revealed several factors that influenced their choice of Technical-Vocational and Livelihood (TVL) track in Senior High School (SHS). One of the primary determinants was school accessibility. Many participants chose tracks offered in schools nearest to their residences, especially those living in interior communities where transportation was a concern. For instance, one participant selected Computer System Servicing (CSS) due to its availability in a nearby school and prior exposure to computers, highlighting the interplay between accessibility and personal interest in shaping SHS track choices.

Another significant factor was the opportunity for employment through National Certification (NC). Participants reported selecting tracks like Cookery or Bread and Pastry because this offered NC II certification, which could secure employment if college enrollment was not possible. This demonstrates that participants strategically considered the employability of SHS TVL tracks as a safety net for future livelihood.

Additionally, personal interest in acquiring technical and vocational skills influenced track selection. Participants expressed eagerness to develop skills relevant to their intended college programs, such as programming in CSS or foundational knowledge in Electrical Installation and Maintenance (EIM) for aspiring electrical engineers. One participant indicated that alignment of the SHS track to future college plans was a key factor, demonstrating foresight and planning in educational decision-making.

While most participants' choices were influenced by pragmatic considerations, peer pressure was also noted as a factor for a few. In some cases, participants enrolled in specific TVL tracks because their friends were doing so, reflecting the social influence among adolescent students.

Theme 2 - Reasons for Choosing Engineering Courses in College

The participants highlighted multiple reasons for pursuing engineering courses, including prospective income, parental guidance, alignment with SHS TVL track, and intrinsic challenges. Some participants cited the high earning potential and the opportunity to engage in practical, enjoyable work such as making floor plans as motivating factors. Others emphasized parental influence**,** reflecting cultural norms where family input significantly shapes career decisions, though some participants gradually developed personal interest alongside parental expectations.

Alignment of SHS TVL tracks to college courses emerged as another critical factor. Participants who took EIM or CSS in SHS related these tracks directly to their chosen engineering courses, perceiving them as foundational preparation for college-level study. Furthermore, the challenge and prestige associated with engineering courses motivated participants to pursue them despite the difficulty, indicating that intrinsic motivation and the desire for professional recognition were also influential.

Theme 3 - Differences in Knowledge About Engineering Courses Before and After Enrollment

Participants reported a knowledge gap upon entering college, noting that SHS TVL tracks provided limited exposure to subjects like calculus and advanced mathematics. Many expressed that their SHS background

contributed only a minimal foundation, with some rating their prior knowledge as low as 10–20% of what was required for college engineering courses.

However, participants consistently reported a progressive increase in knowledge throughout their college experience. On-the-job training (OJT) and practical exposure were particularly valuable in bridging the gap between theory and practice. Participants indicated that hands-on experience in labs and fieldwork enabled them to understand engineering concepts better, develop problem-solving skills, and gain insights into professional responsibilities. This highlights the importance of experiential learning in reinforcing theoretical knowledge acquired in SHS and college.

Theme 4 - Meaningful Learning Experiences in Engineering Courses

Participants recounted varying degrees of difficulty in mastering engineering subjects, particularly during exam

periods when overlapping schedules and summative assessments induced stress and self-doubt. Nonetheless, effective teacher-student relationships contributed positively to their learning experiences. Participants valued instructors who could clarify complex concepts and make subjects relevant, although some reported frustration when minor subjects were poorly delivered.

OJT emerged as a critical component for meaningful learning**,** allowing participants to apply classroom theories to real-world engineering practices. Exposure to actual workplace environments enhanced their understanding of technical procedures, safety standards, and leadership skills. This experiential learning not only improved technical competence but also fostered confidence and professional identity.

Theme 5 - Emotional Experiences in Engineering Courses

The participants experienced a spectrum of emotions throughout their engineering education. Initial frustration and self-doubt were common in early years due to academic challenges. Over time, participants reported pride, satisfaction, and increased confidence as they mastered subjects, completed OJT, and progressed toward graduation. Despite occasional anxiety over potentially failing courses, participants reflected positively on their resilience and persistence, illustrating the emotional growth that accompanies challenging academic pursuits.

Theme 6 - Alignment of SHS Track to Engineering Courses

Participants emphasized the importance of aligning SHS track selection to future college plans**.** While the TVL track provided relevant skills, many suggested that the STEM track would be more suitable for students planning to pursue engineering, as it better equips them with problem-solving skills, advanced mathematics, and foundational knowledge essential for college-level engineering courses. Participants who took TVL tracks expressed the need to supplement their knowledge independently, highlighting potential gaps in SHS preparation for engineering studies.

This discussion emphasizes how students' SHS choices, personal motivations, and practical experiences intersected to shape their engineering education journey. The findings underscore the importance of aligning SHS tracks with higher education goals, offering targeted preparatory programs, and incorporating experiential learning to bridge knowledge gaps.

CONCLUSION

Based on the findings, the study concluded the following:

1. The TVL-SHS graduates struggled with mismatch between their SHS track and their Engineering course. They found little to no relevance of their TVL strands in their current engineering courses pursued. This suggests that the TVL-SHS implementation in various communities must be reviewed so that students are provided with more opportunities to select suitable SHS strands/tracks for future college course choices.

2. The TVL-SHS graduates felt that they had no adequate knowledge and skills acquired from their enrollment in the different TVL strands/tracks when they pursued engineering courses in college. Some minor subjects, such as those in electrical wiring and software management in IT, have helped them with their subjects in engineering. This indicates the crucial importance of aligning the TVL-SHS competencies with the different engineering courses available in colleges and universities where this track is offered.
3. The TVL-SHS graduates cited financial constraints and failed subjects as difficulties encountered in their enrollment in engineering courses. These two reasons confirmed existing literature that financial constraints and lack of academic preparedness were the reasons for the difficulties that SHS graduates experience.

It is strongly recommended that the Department of Education (DepEd) and the Commission on Higher Education (CHED) utilize these findings to collaboratively design an intensified Bridging Program focusing specifically on advanced mathematics and science concepts for TVL graduates entering engineering. Future research should expand this into a mixed-methods study, using the six themes as basis for a large-scale quantitative survey across multiple regions and universities to statistically confirm the curriculum mismatch. Finally, guidance counseling protocols in the SHS must be reformed to accurately convey the academic rigor required for engineering, ensuring students' motivations are fully informed by realistic preparation.

RECOMMENDATIONS

It is strongly recommeded that the Department of Eduation (DepEd) and the Commission on Higher Education (CHED) utilize these findings to collaboratively design an Intensified Bridging Program focusing specifically on advanced mathematics and science concepts for TVL graduates entering engineering. Future research should expand this into a mixed-methods study, using the six themes as a basis for a large-scale quantitatives quantitative survey across multiple regions and universities to statistically confrim the curriculum mismatch. Finally, guidance counseling protocols in the SHS must be reformed to accurately convey the academic rigor required for engineering, ensuring students' motivations are fully informed by realistic preparation.

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