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Utilization of Competency-Based Training Approach in Teaching Computer System Servicing in Public High Schools

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Abstract: Effective instructional delivery relied on the teaching approach. The Competency-Based Training (CBT) Approach, aligned with industry requirements, was considered the best approach in vocational education. With the Department of Education (DepEd) requiring teachers in Technical-Vocational-Livelihood (TVL) tracks to hold a Trainer's Methodology (TM) Certificate, this study assessed the level of utilization of Computer Systems Servicing (CSS) teachers' use of the CBT approach in public high schools in Batangas Province, examined patterns of association between teachers' demographic profiles and their level of utilization, and determined the challenges they encountered in utilizing the CBT approach. The study employed a descriptive design, and data were gathered from 46 Technology and Livelihood Education (TLE) and TVL teachers through a structured questionnaire. Results showed that most teachers held only a bachelor's degree, had varied teaching experience, attended fewer than five CSS-related seminars, and lacked TM certification. Despite this, CSS teachers moderately to highly utilized CBT principles. The null hypothesis was accepted, which implied that effective utilization of CBT depended more on systematic support and institutional resources than on teachers' profiles. However, persistent challenges, such as misalignment between the curriculum and industry needs, limited resources, and a lack of standardized assessment tools, hindered the utilization of CBT principles. As a result, the study proposed an instructional enhancement package. Recommendations included establishing stronger industry relationships, improving access to updated instructional materials and assessment tools, supporting TM certification and professional development, and adopting innovative strategies to enhance competency-based instruction.

Keywords: *Competency-Based Training, Computer System Servicing, Technical-Vocational Education, Instructional Delivery, Industry Alignment.*

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I. INTRODUCTION

With the continuous growth of the educational system, the need to use different approach in instructional delivery is needed. From diverse learners, varied learning styles, 21st century skills, rapid technological changes, and the engagement and motivation. Due to this, DepEd imply suggest that teachers must use different approach that align the needs of the society. In response the competency-based training (CBT) approach as a suitable and internationally accepted strategy, especially in vocational education, like TLE and TVL.

The CBT learning model is based on the standards set by the industry. Students under this approach allow to progress at their own pace, ensuring mastery of specific competencies before moving to the next competency. In the Philippines, this approach is widely used in TESDA programs and is integral to the Trainers Methodology Level 1 qualification. It consists of the competencies that a TVET trainer who is acting as both an assessor and a trainer must meet and deals with the design and implementation techniques. The CBT approach emphasizes modular training modules, individualize learning, practical task performance, and outcomes-based assessments aligned with industry standards.

In connection to this, based on DepEd Order No. 51, s. 2017, a TVL teacher must have a National Certificate (NC) for the specific subject or course they will teach, such as Computer System Servicing, Cookery, Programming, Welding, and others. Additionally, they must have a Trainer's Methodology Certificate, which certifies their ability to effectively train students. The Trainer's Methodology training focuses on teaching educators how to use the Competency-Based Training (CBT) approach to enhance student learning.

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Teachers play a crucial role in effective utilization of CBT approach. Their educational background, teaching experience, training exposure, and certification significantly influence how well are they in aligning the curriculum, preparing instructional materials, implementing individualize learning, and assessing students' competencies. Teachers must have mastery of their subject matter, and they must have a system for evaluating the students' performance. Cox [1] states that to be an effective teacher, they need to have a variety of professional development skills along with mastery of their subject matter and experience.

By utilizing the CBT in teaching it can enhance the quality of education and ensure the that the students will be competent for the workforce. In actual classroom settings, teachers are expected to manage diverse learners, facilitate individualized and self-paced learning, and conduct a performance-based assessment while managing multiple teaching responsibilities. Also, CBT approach gives students a chance to learn at their own pace, gain real-world experience and build on their existing knowledge and skills.

Belayneh [2] suggests that to improve training quality, partnerships with employers, industry associations, and unions are needed, and government capital should be allocated to TVET institutions. Perez [3] also suggest that the interventions such as contextualizing learning materials and modifying class schedules could help address the issues and challenges in implementing CBT approach.

Teachers' educational background is important for effective instruction, fostering student competence and job readiness. Continuous professional development is essential for meeting evolving market needs. According to Naelgas [4], teachers with degrees that match to their teaching load demonstrate a better-quality instruction and mastery to the content.

Teaching experience in CSS improves classroom management, content delivery, and flexibility, but effectiveness depends on the sustained practice, continuous professional development, and adaptability in teaching strategies. This was supported by the study of Hussain [5], that states teachers with more teaching experience are more effective in instructional delivery.

Teachers' continuous professional development through seminars and training enhances their competence, instructional effectiveness, and career advancement, preparing them for the dynamic technical environment. Habla [6] recommend that TVL teachers should receive continuous professional growth education to enhance their effectiveness and efficiency.

The Trainers Methodology (TM) Certificate is necessary for high school teachers, enhancing technical expertise, pedagogical competence, and professional growth in curriculum design, training delivery, and learner assessment. Prigo [7] further supports that the Trainers Methodology approach is a highly effective method for creating localized and contextualized instructional materials, enhancing teaching experience and academic recognition.

In CBT the curriculum should be align in industry standards, focusing on practical tasks for students to gain necessary skills. According to Alinea [8], a curriculum closer to industry enhances work-based learning. This ensures that learners can demonstrate measurable competencies required by the industry, instead of focusing on the theoretical instruction alone.

The use of instructional materials in instructional delivery is one of the principles of CBT to support student to progress at their own pace. These materials should be modular, contextualized, interactive, and regularly updated to reflect industry standards. According to Albarico [9] instructional materials enhance teaching strategies, making it easier for students to grasp lessons, acquire skills, and succeed in their chosen field.

In competency-based training approach, the assessments assess the learner's industry-required skills, ensuring they are competent in the real-world job situations. Goff [10] emphasizes the importance of competency assessment in competency-based training, which evaluates learners' ability to apply learned skills in the workplace.

However, despite the advantages of using the CBT approach, teachers face challenges when implementing the approach. One significant problem is the instruction provided by the school heads that sometimes does not align with the principle of CBT. This misalignment can give hard time for the effective implementation of the approach, as teachers struggle to balance the instruction given by the heads with the need to use of competency-based training approach. According to Stevenson [11], the misalignment of the approach may affect teachers working life such as teacher stress, attrition, and ineffective behavior support practices.

Another factor is, the use of CBT approach only in specialized subject of TVL, while other subjects use other methods, creates different educational experience for the students. These differences can lead to difficulties in integrating and optimization of CBT principles in teaching environment, that may limit the effectiveness of the approach.

Additionally, since the DepEd order is new, there is a lack of materials and training for the teachers in utilizing the CBT approach. This problem makes it more challenging to the teachers to integrate and utilize the CBT approach effectively. Castro-Alonso et al. [12] emphasizes the need for well-designed materials to prevent cognitive overload and enhance learning outcomes. The lack of such materials can lead to ineffective instructional delivery and hinder student learning.

In light of this, it is important to assess how CSS teachers in public high schools utilize the CBT approach in their instructional delivery. Specifically, this study aims to evaluate the extent of CBT utilization, examine

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how teacher profiles influence implementation, and identify prevailing challenges. And the goal of this study is to come up with the development of a toolkit for CSS teachers to enhance the instructional delivery in Computer System Servicing in Batangas province. This toolkit will serve as a tool or guide for the teacher in utilizing the different principles in CBT approach. Evaluate The findings will provide insights into effective strategies for enhancing the CBT approach and developing suitable instructional materials. The researcher wants to pursue this study to contribute for the improvement of CSS instruction in the province.

The importance of teacher guides in supporting teacher and student learning process. These guides should communicate conceptual goals, provide knowledge for teaching plans, reinforce pedagogical content, offer practices, present alternatives, and engage teachers in ongoing reflection. In countries lacking quality pre-service training, these materials can help compensate for missing knowledge or practice. The lesson plans and guides should align with the curriculum and classroom realities, promoting learner-centered pedagogies to help teachers manage the classroom and efficiently transmit knowledge as stated by IEEP [13]. Also, Boahin [14] a teacher's guide can aid educators in creating lesson plans that prioritize skill development over knowledge accumulation. They use a competency-based structure to create personalized learning experiences, aligning with industry-specific competencies. This approach promotes personalized learning, allowing students to progress based on mastery of competencies, rather than classroom time.

II. METHODOLOGY

This study made use of descriptive research design to gather measurable data for statistical analysis of the population sample. This design was suitable because the study described current conditions and examined patterns of association between teachers' profiles and their CBT utilization levels. According to Miksza et al. [15], descriptive research investigates what is, what exists, or the present condition of a topic of interest. The design was used to calculate frequencies, percentages, weighted means, and other statistical measures. Given the small population size, the researchers employed a census approach for data collection. All 46 CSS public school teachers in Batangas Province were invited to participate in the study.

The main instrument used in the study was the researcher-made questionnaire, which was evaluated, administered, tallied, and scored according to the accepted practices in research. The questionnaire has four parts: Part I contains the demographic profile of the respondents in terms of educational background, number of years teaching CSS, number of related seminars attended in CSS, and TM certification; Part II assessed the level of utilization of CSS teachers in CBT approach in their instructional delivery in terms of curriculum alignment, instructional materials, individualize learning, and assessment methods; and lastly, is the Part IV that determines the challenges in utilizing CBT approach.

Furthermore, the data collected undergoes statistical treatment. The statistical tool used in this study to analyze the data gathered was the weighted mean. The following weighted mean ranges were utilized in analyzing and interpreting the data: 1.00-1.49 (Not Utilized/ Disagree), 1.50-2.49 (Slightly Utilized, Slightly Disagree), 2.50-3.49 (Moderately Utilized, Agree), 3.50-4.00 (Highly Utilized, Strongly Agree)

III. RESULTS AND DISCUSSION

From the data gathered, the following findings were obtained.

To understand the characteristics of the study participants and their potential influence on the research findings, a demographic profile of the respondents was developed. In this section, the demographic profile including their educational background, number of years in teaching CSS, number of related seminars attended in CSS, and Trainers Methodology Certificate.

- *Educational Background*

Table 1 presents the distribution of educational levels among the respondents, including the percentage of the respondents with various degrees.

Table 1. Respondents' Educational Background

Items	Frequency	Percent
Bachelor's Degree	31	76.4
Advanced Degree	15	32.6
Total	**46**	**100**

As presented in Table 1, revealed that the majority of the respondents held a bachelor's degree, while the remaining teachers had advanced degrees. It reflects that the teaching staff has strong dedication to lifelong learning and professional development. This is aligned with the Department of Education's recommendation that educators seek higher education to improve their instructional competency and advance their careers, DepEd [16].

However, a considerable number have completed or are actively pursuing advanced education. As research consistently shows, higher educational background is linked to better utilization of competency based training approach. Batuigas [17] found that teachers with advanced degrees tend to demonstrate higher levels of effectiveness in the classroom, most likely because of their deeper understanding of the subject matter, improved pedagogical skills, and enhanced capacity for critical thinking and problem-solving.

Further, to ensure continuous growth and adaptability, the teaching profession strongly encourages professional development and higher education. The importance of continues education in fostering instructional excellence is supported by Tubog [18] findings that master teachers with graduate degrees were rated as "very competent" in content knowledge and pedagogy.

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➢ *Number of Years in Teaching CSS*

Years of experience instructional delivery enhances that teachers' ability to plan, deliver, and adapt lessons to diverse student's needs. It leads to better student outcomes, stronger teacher-student relationships and a more conducive environment. In order to align their expertise in utilizing the CBT approach when teaching the CSS subjects, it is crucial to know how long they have been teaching the said matter.

Table 2. Number of Years in Teaching CSS

Items	Frequency	Percent
5 years and below	23	50.0
6 years and above	23	50.0
Total	46	100

As presented in Table 3, The study found that respondents with five years of experience and those with more than five years of experience were evenly distributed. It may suggest that many teachers are just starting out in their careers, this could influence their familiarity in utilizing the CBT approach.

According to Hussain [5], teachers who have more experience in teaching are more effective in instructional delivery. Similarly, Prigo [7] states that teachers with more years of experience showed a much-improved pedagogical skills, deeper understanding of complex concepts, and better classroom management. Research indicates that newly CSS teachers were not given enough training or support in terms of utilization of CBT approach. This indicates a gap between current experience level of CSS teachers and their qualification that could affect their understanding in instructional delivery.

➢ *Number of Related Seminars Attended in CSS*

To learn more about the respondents' professional development growth, the number of seminars they attended at were examined. The frequency in which they attended seminars about CSS is tabulated below.

Table 3. Number of Related Seminars Attended in CSS

Items	Frequency	Percent
5 seminars and below	29	63.0
6 seminars and above	17	37.0
Total	46	100

As presented in Table 3, professional development, the analysis showed that most respondents attended a few seminars, while a smaller portion participated in several seminars. Despite of challenges such us scheduling conflicts, lack of access, or institutional support, these teachers continue to enhance their competency in CSS. Mallari [19] stated, Professional development empowers teachers to engage with the latest research, educational trends, and innovative teaching methods.

The benefits of having training programs for teachers is supported by Li [20] findings that teachers' professional competency in the educational use of ICT was improved through hands-on experiences in school-based trainings. These programs must focus on educating the teachers on the importance of using ICT tools for promoting student learning and academic achievement.

➢ *TM Certificate*

Table 4 presents the distribution of respondents according to the possession of a Trainers Methodology (TM) Certificate.

Table 4. Trainers Methodology Certification

Items	Frequency	Percent
With TM Certificate	20	43.5
Without TM Certificate	26	56.5
Total	**46**	**100**

As shown in Table 4, some respondents held a TM certificate, while the remaining respondents did not possess this certification. This indicates that, although a portion of teachers have completed a formal training in methodology, over half of the teachers still lack this certification. The certification is crucial for ensuring the readiness of the teacher in effectively utilize the CBT approach in teaching CSS.

According to Endraca [21] that the Trainers Methodology Program is highly effective for teachers, with factors such as competitiveness and credentials of the facilitator/trainer being highly effective. Having said that, teachers must participate in continuous professional development program to equip them in methodological skills, to strengthen the implementation of CBT approach in CSS.

➢ *Utilization of CSS Teachers in CBT Approach in their Instructional Delivery in Terms of Curriculum Alignment*

Utilization of the CBT approach requires the teacher to apply their knowledge and skills for effective instructional delivery in terms of aligning the curriculum, creating instructional materials, providing individualized learning, and following a method in assessment. This section will explore the strategies teachers use to effectively utilize the CBT approach in their teaching. By understanding the principles of CBT, teachers can foster a conducive learning environment that supports students' success.

Since the K-12 curriculum is relatively new, it undergoes regular revisions to better meet the needs of the students. Table 5 examines the extent to which CSS teachers utilize the CBT approach in aligning the curriculum.

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Table 5. Utilization of CBT Approach on Instructional Delivery Relative to Curriculum Alignment

Items	WM	VI
Deriving the content directly from established industry competency standards.	3.57	SA
Aligning instructional delivery with the competencies required by the workplace.	3.74	SA
Training activities are focused on the tasks that learners will perform in their jobs.	3.63	SA
Learning outcomes are based on the competencies students need to succeed in the job.	3.76	SA
Including both theoretical knowledge and practical skills, the curriculum equips learners with what they need to perform in their jobs.	3.72	SA
Updating the curriculum regularly ensures alignment with current industry standards and competencies.	3.46	SA
Balancing classroom-based off-the-job learning with practical on-the-job experiences enhances training effectiveness.	3.39	A
Examining the alignment of learning outcomes with the industry demands.	3.46	A
Reflecting on the evolving trends and technological advancements in the computer system servicing industry.	3.57	A
Integrating feedback from industry professionals and employers into the curriculum to ensure its relevance.	3.33	A
Composite mean	**3.56**	**SA**

Legend: WM = Weighted Mean
VI = Verbal Interpretation
SA = Strongly Agree
A = Agree

Respondents were assessed regarding their agreement on the application of the CBT approach relative to curriculum alignment. The results indicated that most respondents strongly agreed with the principles of CBT in curriculum alignment. In terms of specific strategies, the most highly utilized involved designing learning outcomes based on the competencies students need to succeed in the workplace, followed by aligning instructional delivery with required workplace competencies and incorporating both theoretical knowledge and practical skills to equip learners for job performance. This emphasis is consistent with Roble [22], who argue that curricula must prioritize essential industry related competencies. Similarly, Yusvana [23] stated that industry collaboration and meeting their demands strengthens CBT curriculum alignment.

However, respondents reported lower utilization of strategies such as regularly updating the curriculum to align with current industry standards, balancing classroom-based learning with practical on-the-job experiences, and integrating feedback from industry professionals to ensure curriculum relevance. Despite these gaps, the overall composite means reflected a high level of agreement. Maintaining curriculum relevance requires continuous alignment with industry demands. Esguerra [24] emphasized that technical vocational education must constantly be in line with the demands of the industry, while Diamonon [25] recommend regular curriculum updates aligned with industry standards is necessary to prevent students from lagging behind in industry expectations.

Composite mean results show that CSS teachers strongly agree that the CBT approach aligns with curriculum alignment with competencies related to industry and workplace tasks. These findings imply that strengthening the institutional support system and industry collaboration may further improve curriculum alignment and guarantee that CSS instruction remains relevant, responsive, and in line with current and future demands.

Table 6. Utilization of CBT Approach on Instructional Delivery Relative to Instructional Materials

Items	WM	VI
Reinforcing practical skills through instructional materials supports learners' career readiness.	3.54	SA
Matching tools and equipment to job-related tasks enhances learners' skill development.	3.52	SA
Selecting instructional materials carefully ensures alignment with curriculum and competency requirements.	3.52	SA
Making training resources easily accessible supports learners in meeting competency standards.	3.46	A
Using instructional resources relevant to the curriculum's learning outcomes strengthens knowledge retention.	3.43	A
Assessing the sufficiency of instructional material for competency-based learning.	3.39	A
Using equipment that mirrors real work situations prepares learners for actual job tasks.	3.39	A
Ensuring that training facilities and resources are appropriate for teaching required competencies improves learning efficiency.	3.35	A

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Keeping training materials up-to-date ensures alignment with current industry standards.	3.30	A
Providing training materials that directly support competency standards enhances learning outcomes.	3.28	A
Composite mean	**3.42**	**A**

Legend: WM = Weighted Mean VI = Verbal Interpretation
SA = Strongly Agree A = Agree

Regarding instructional materials, respondents generally agreed with the utilization of the CBT approach in their instructional delivery. Teachers strongly agreed that reinforcing practical skills through instructional materials supports learners' career readiness, that matching tools and equipment to job-related tasks enhances skill development, and that carefully selecting instructional materials ensures alignment with curriculum and competency requirements. Abuga [26] emphasized that instructional materials like training module allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning. This view was supported by the study of Barrera [27], for skill development of SHS-TVL schools' instructional materials is needed.

Meanwhile, agreement was lower for strategies such as ensuring that training facilities and resources are appropriate for teaching required competencies, keeping training materials up-to-date to align with current industry standards, and providing materials that directly support competency standards to enhance learning outcomes. Alarcon [28] emphasizes that to foster effective delivery, schools must have proper facilities and tools that is aligned with the TESDA, while Malaluan [29] underscored the importance maintaining updated materials and resources and the procurement system should be efficient and responsive.

The composite mean shows that CSS teachers agree that instructional materials support the CBT approach. To further improve instructional delivery and guarantee that CSS students are prepared to industry demands, strengthening institutional support through improved resource allocation, regular material updates and systematic evaluation of instructional materials are needed.

Table 7. Utilization of CBT Approach on Instructional Delivery Relative to Individualize Learning

Items	WM	VI
Offering personalized feedback helps learners track their performance and improvement.	3.61	SA
Offering opportunities for learners to set personal learning goals empowers them to take ownership of their learning journey.	3.57	SA
Adapting teaching methods to meet individual needs enhances learning effectiveness.	3.57	SA
Encouraging learners to revisit or review previous modules strengthens understanding.	3.54	SA
Providing tailored support ensures learners receive the guidance needed to achieve competencies.	3.54	SA
Accommodating learners with diverse backgrounds and experiences allows for flexible learning pathways.	3.54	SA
Encouraging peer collaboration and sharing of experiences supports diverse learning approaches.	3.50	SA
Allowing learners to progress at their own pace ensures mastery of each competency.	3.43	A
Organizing training into manageable, self-contained modules focusing learning on specific competencies.	3.33	A
Offering multiple entry and exit points in the training program accommodates different competency levels.	3.30	A
Composite mean	**3.49**	**A**

Legend: WM = Weighted Mean VI = Verbal Interpretation
SA = Strongly Agree A = Agree

Regarding individualized learning, respondents generally agreed with the utilization of the CBT approach in their instructional delivery. Teachers strongly agreed that offering personalized feedback helps learners track their performance and improvement, providing opportunities for learners to set personal learning goals, and adapting teaching methods to meet individual needs. Ponomariovienė [30] emphasized that individualized learning can create a coherent and inclusive CBT educational process by accommodating diverse learning abilities and ensuring equitable access to skill development. Empirical studies support the effectiveness of modular and individualized learning approaches; Betlen [31] found that students who used the modular learning approach significantly improved their academic performance.

Lower agreement was noted for strategies such as allowing learners to progress at their own pace to ensure mastery of each competency, organizing training into manageable, self-contained modules focusing on specific competencies, and offering multiple entry and exit points in the training program to accommodate different competency levels. Valmorida [31] observed that to succeed in modular distance learning, students must actively pursue independent learning, which requires self-management.

The composite mean shows that CSS teachers agree that individualized learning practices in the utilization of CBT approach. To achieve the objectives of CBT approach in CSS instruction and guarantee consistent utilization of individualized learning, it is vital to

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improve institutional support, instructional planning, and resource availability.

Table 8. Utilization of CBT Approach on Instructional Delivery Relative to Assessment Methods

Items	WM	VI
Providing practical, real-world tasks in assessments strengthens competency-based learning.	3.72	SA
Reflecting real-world job tasks in assessments enhances relevance and applicability.	3.70	SA
Recognizing prior learning and experience allows learners to gain credit for existing competencies.	3.67	SA
Including both formative and summative evaluation methods in assessments for tracking learner progress.	3.67	SA
Offering multiple opportunities for learners to demonstrate competencies supports skill mastery.	3.63	SA
Including ongoing feedback in the assessment process helps learners improve and meet industry standards.	3.61	SA
Aligning assessments with industry-required competencies ensures authentic skill demonstration.	3.59	SA
Reviewing the alignment of assessment methods with competency standards.	3.59	SA
Designing assessments to measure task performance according to industry standards ensures competency.	3.57	SA
Allowing learners to enter or exit the program based on demonstrated competencies supports flexible learning.	3.50	SA
Composite mean	**3.62**	**SA**

Legend: WM = Weighted Mean VI = Verbal Interpretation
SA = Strongly Agree A = Agree

Respondents generally agreed with the utilization of the CBT approach in their instructional delivery regarding assessment methods, indicating a high level of agreement. Teachers strongly agreed that providing practical, real-world tasks in assessments strengthens competency-based learning, reflecting real-world job tasks enhances relevance and applicability, recognizing prior learning and experience allows learners to gain credit for existing competencies, aligning assessments with industry-required competencies ensures authentic skill demonstration, and designing assessments to measure task performance according to industry standards. Petalla [32] noted that well-designed assessments enhance real-world skill transfer and students' overall learning experience by evaluating performance through specific, observable results in both process and outcome. Similarly, Pelayo [33] claims that assessment is necessary to improve both student performance and overall school performance in delivering instruction.

The lowest-rated indicator involved allowing learners to enter or exit the program based on demonstrated competencies, although it was still interpreted as strongly agreed. Mustamin [34] emphasized that formative and summative assessments improve teaching quality and student outcomes. Piosang [35] further discussed various levels of assessments, from classroom to international afocusing on exercises, objectives, students' knowledge, and responsibility, which support learner improvement and ensure alignment between instruction and assessment.

High composite means show that CSS teachers strongly agree that the assessment methods in their instructional delivery are aligned with the CBT approach. To further strengthen this alignment, enhancing institutional flexibility and policy support is necessary to improve assessment procedures and ensure that CBT-based assessment is fully implemented in CSS instruction.

- *Association Between the Demographic Profile of Teachers and their Level of Utilization of the Competency-Based Training Approach Through Cross-Tabulation Analysis.*

In teaching CSS in TLE and TVL tracks, teachers must utilize the principles of CBT approach despite their demographic profile. This section provides a cross-tabulation analysis of the relationship between CSS teachers' demographic profile and the level of utilization of the competency-based training approach to instructional delivery. The four major components are the focus of the analysis: curriculum alignment, instructional materials, individualized learning, and assessment methods. Pearson's chi-square test of independence was employed to determine whether significant associations exist, while φ-coefficients were calculated to assess the strength of relationships. The hypothesis of the study (Ho) states that there is no significant association between the demographic profile and the level of utilization of the CBT approach. The following table present the results.

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Table 9. Summary of the Association Between CSS Teachers' Profile and Their Level of Utilization of the CBT Approach Across Four Areas

CBT Area	φ-coefficient Range	p-value Range	SF	I
CA	.060 – .100	.497 – .683	None	Not significant
IM	0 – .277	.060 – 1.000	None	Not significant
IL	.107 – .236	.109 – .467	None	Not significant
AM	0 – .096	.516 – 1.000	None	Not significant

Legend: CA = Curriculum Alignment IM = Instructional Materials
IL = Individualize Learning AM = Assessment Methods
SF = Significant Findings I = Interpretation

Based on the results of the conducted analysis, the study consistently found no significant associations across all four domains, such as curriculum alignment, instructional materials, individualized learning, and assessment methods. The study found no significant association between the demographic profile of the teachers, like educational background, years of teaching, seminars attended, and TM certification, suggesting that CSS teachers in Batangas Province utilize the CBT approach uniformly, regardless of professional or demographic differences.

This finding aligns with Alonzo [36], who argued that even when teachers possess the necessary knowledge, contextual factors have a greater impact on actual implementation than individual teacher background. Similarly, Baruela [37] observed that teachers' instructional skills varied from developing to proficient across all areas, with no significant differences based on respondents' profiles. Regañon [38] further asserted that teachers can effectively utilize the CBT principles to improve students' outcome in TVL, not necessarily tied to very high credentials but more to implementing a well-structured intervention. Mendoza [39] likewise reported no significant differences in assessment practices across the profile of the respondents, though the study noted that certain areas may benefit from targeted interventions to further strengthen implementation.

Therefore, based on the findings of the cross-tabulation analysis, the null hypothesis (H_0) is accepted. Confirming that the demographic profile of the CSS teachers does not significantly influence their level of utilization of the CBT approach in instructional delivery.

- *Challenges in Utilizing the Competency-Based Training Approach.*

The thematic analysis of teachers' responses regarding challenges in utilizing the CBT approach identified key issues. A major challenge identified was the misalignment between the CSS curriculum and current industry standards. There is a knowledge gap between what is the instructional content and what is required by the industry since the rapid technological advancements in computer systems outpace curriculum updates. Similarly, Alinea [8] found that curriculum misalignment is a major cause of graduate skill gaps and recommends stronger school and industry collaboration and work-based learning.

Another significant challenge was the insufficient and outdated resources and infrastructure were also identified as major challenges. Teachers highlighted the lack of modern computers, networking tools, and software programs necessary for practical demonstration. While some schools have equipment, it often fails to meet the specialized requirements of related ICT competencies. This mismatch between the available resources and instructional needs hindered the effectiveness of the competency development. The Asian Development Bank [40] supported this observation, citing outdated tools, limited equipment, inadequate training facilities are key barriers to effective vocational education in the Philippines.

Large class sizes and low engagement were also identified, particularly in individualized and self-paced learning, as one of the principles of CBT. Teachers also face difficulties in keeping track of students' progress and providing immediate and individualized feedback in large classes. Time constraints, curriculum demands, and limited teacher support mechanisms further compounded these challenges.

Assessment practices were likewise affected, While teachers employed such as oral exams, checklists, and performance-based rubrics that align with the principles of CBT approach. However, lack of standardized assessment tools and limited industry involvement in the evaluation process were also emphasized by the teachers. As a result, assessments did not always fully reflect the skills and standards expected in actual work settings. Teachers also noted that the validity and authenticity of practical assessment is sometimes constrained by the availability of equipment, tools, and facilities.

These challenges corresponded with the quantitative findings, which indicated that full utilization of the CBT approach in CSS instruction was significantly constrained by resource limitations and classroom management issues, with instructional materials and individualized learning being only moderately utilized.

- *Proposed Instructional/Enhancement Toolkit for CSS Teachers.*

The researchers developed a toolkit to improve CSS teachers' utilization of the CBT approach in their instruction. The toolkit specifically addressed challenges related to curriculum alignment with industry standards, availability of instructional materials, facilitation of individualized learning, and competency-based assessment practices. The first package is composed of three lesson plan sets; each

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corresponds to competencies of CSS. This could help teachers to provide effective instructional delivery in a technical-vocational education setting. Next, a package that offers comprehensive student training modules to address limited resources and self-paced learning needs. These modules ensure that students will gain mastery in practical skills while fostering independence and inclusivity. The third package includes assessment tools that measure both the theoretical and practical skill of the learners, including rubrics, skills checklists, and competency-based portfolio requirements that is aligned with the TESDA's Training Regulations. Standardize assessment methods empowers CSS teachers to deliver instruction aligned with TESDA, focusing on measurable performance, using real-world tools, being adaptable to various modes, and focusing on competency and employability. Lastly, a package that contains CBT utilization guides for CSS teachers, focusing on the utilization of CBT approach, instructional materials development, competency-based assessment design, and self-paced learning strategies. This ensures the teacher's capability to utilize CBT effectively by empowering industry relevance, instructional quality, and standards-based teaching. The "Utilization of Competency-Based Training Approach: A CSS Teacher's Toolkit" offers practical interventions to equip teachers with strategies and confidence to effectively deliver CBT principles. It enhances teaching practice and ensures that students will gain competencies relevant to the industry, strengthening the implementation of the competency-based approach in technical-vocational education.

Fig 1. CSS Teacher's Toolkit

IV. CONCLUSION

- The majority of CSS teachers held a bachelor's degree, had around five years of experience, had attended a few CSS-related seminars, and did not possess TM certification.
- The assessment of CSS teachers' utilization of the CBT approach in instructional delivery indicated moderate to high application, with notable strengths in curriculum alignment and assessment methods, while instructional materials and individualized learning were identified as areas needing improvement.
- No significant association was found between teachers' demographic profiles and their level of CBT utilization, suggesting that the effective use of the CBT approach depended more on systematic support and institutional resources than on individual teacher characteristics. Consequently, the null hypothesis was accepted.
- Persistent challenges, including misalignment of the curriculum with industry standards, limited resources, difficulties in classroom management and student engagement, lack of standardized assessment methods, and a need for ongoing professional development, hindered the effective implementation of CBT principles in CSS instruction.
- An instructional enhancement package was developed to support teachers in applying the principles of the CBT approach in their teaching.

RECOMMENDATIONS

- The prepared package may be submitted to expert for review and validation before using in computer system servicing instruction for junior and senior high school students to ensure its relevance, clarity, and effectiveness.
- School may consider investing in updated technology and modern ICT resources, establish stronger industry partnerships, and standardizing assessment tool to enhance students' practical skills and meet TESDA and industry competency standards.
- For future researchers may expand the scope of the study by including other TLE and TVL courses, explore student perspectives on CBT approach and assess the effectiveness of proposed instructional package in teachers' instructional delivery and learner's outcome.

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