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Efficacy of Flipped Mastery Instruction in Enhancing Social Learning Dynamics for Food and Beverage Services in Senior High School TVL Tracks

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ABSTRACT: This study examined Food and Beverage Services (FBS) classes, drawing on constructivism, social constructivism, mastery learning, and connectivism. The research addressed the gap between the Technical- Vocational- Livelihood (TVL)–FBS curriculum' s aim to produce industry- ready graduates and classroom realities marked by student passivity, limited hands- on practice, and weak peer interaction. Data were collected from TVL–FBS students who participated in flipped mastery instruction, using structured 5--point Likert- type questionnaires that measured three domains: social learning behaviors (resource sharing, collaborative norms, peer support, conflict resolution), perceived effectiveness of key aspects of flipped mastery instruction (class activities, teacher facilitation, mastery- based learning, peer- teaching opportunities, direct feedback, personalized learning paths), and willingness to collaborate (shared goals, hands- on time, communication skills, peer teaching, skill improvement). Descriptive statistics (means and standard deviations) summarized student responses, and one- sample t--tests compared mean scores to the neutral midpoint of 3. 00 on the Likert scale to determine whether ratings were significantly more positive than "sometimes/neutral." The results showed that all social learning behaviors occurred at levels from "often" to "very often, " and all aspects of flipped mastery and collaboration indicators were rated significantly above neutral (p <. .001). Class activities, teacher facilitation, mastery- based learning, and peer teaching emerged as the most influential design elements in fostering positive social learning dynamics. These findings suggest that flipped mastery instruction not only increases opportunities for technical practice but also enhances collaboration, peer support, and interpersonal skills, thereby aligning classroom practice more closely with the TVL–FBS goal of developing socially and technically competent graduates for the hospitality industry.

KEYWORDS: *Flipped, Food, High School, Mastery, TVL*

I. INTRODUCTION

Students often show passivity during demonstrations, have limited chances to practice skills on their own, and lack structured paths for collaborative learning. These factors together hinder the development of strong social learning dynamics in the classroom. A student who only practices a single skill and then stops is often more proficient at that skill the next day than at the end of the laboratory session (Malone, E., 2019).

The Technical-Vocational-Livelihood (TVL) track in the Philippines provides students with practical skills and knowledge to prepare them for the workforce. It is a vital component of the K-12 program introduced by the Department of Education (DepEd) in 2013 (Ferrer, 2022). The TVL strand offers vocational training to students in Philippine Senior High Schools, equipping them for work, business, and further technical education. The program emphasizes hands-on training, allowing students to earn National Certifications (NCs) through TESDA. It delivers technical-vocational education through academic and skill-based programs designed to meet community development and international employment needs, delivered by trained teachers who are experts in their fields (Benítez et al., 2022). Key focus areas include curriculum development, teacher training, resource allocation, industry partnerships, assessment and evaluation, student support services, quality assurance, policy improvement, stakeholder engagement, legal compliance, data analysis, and promoting inclusivity and equity (Arban et al., 2024).

The Technical-Vocational Livelihood (TVL) track of SHS provides students with technical skills and academic knowledge to meet both community and global workforce needs (Brillantes et al., 2019, cited in Ramos, 2021). The K to 12 Basic Education Program features Senior High School (SHS), which offers four tracks: Technical-Vocational-Livelihood (TVL), Academic, Sports, and Arts & Design. The TVL Track includes four strands: Agri-Fishery Arts (AFA), Home Economics (HE), Information and Communication

Technology (ICT), and Industrial Arts (IA), each offering different specialized study programs. https://www.deped.gov.ph/wp-content/uploads/2020/11/DO_s2020_035.pdf. The SHS Technical-Vocational Livelihood (TVL) track provides various specializations in agriculture and fishery, garments and tourism, health and processed food and beverages, social and community development service, automotive and land transport, construction, electronics, furniture and fixtures, metal and engineering, utilities, and information and communication technologies fields (DepEd Order No. 21, series 2019).

Students in the Technical-Vocational-Livelihood (TVL) Track Home Economics strand can take Food and Beverage Services (FBS), a specialized program that prepares students with key skills for careers in the hospitality and food service industry. The course teaches practical skills for front-of-house tasks, including table service and guest interaction, as well as food service operations. It also enables students to earn a National Certificate Level II (NC II) from TESDA, validating their qualifications for roles such as food attendant, waiter, and bar server. The food and beverage service industry offers valuable learning opportunities when staff gain hands-on experience with core service tasks. Moreover, the industry continues to grow (Masigan, 2019). Additionally, working in this field helps 21st-century students develop the skills needed to stay competitive globally in a fast-changing society (Montes et al., 2020).

Flipped mastery instruction can help address the limitations of remote Tech-Voc learning by shifting basic content (videos, readings, and online modules) to independent study, so that limited face-to-face or hands-on time can focus on practicing skills with specialized equipment and teacher guidance, which students lack at home *(Hoftijzer et al., 2022*). In this setup, students arrive already familiar with the theory and then utilize classroom sessions to demonstrate mastery of practical tasks. receive immediate feedback, and work at a flexible pace until they achieve the required level of competence, rather than just completing written modular activities *(Majumdar et al., 2020; Vallesteros, 2022).* This directly supports social learning because, during in-person or synchronous sessions, students can observe the teacher and peers performing tasks, imitate these actions, collaborate, and learn through guided practice and interaction, which are central processes in social learning theory and are often missing in purely modular distance learning *(Vallesteros, 2022).*

A significant gap exists between the goals of the TVL–FBS program and what is actually seen in many classrooms. The TVL track aims to develop strong, industry-ready practical skills through intensive hands-on training, various specializations, and preparation for TESDA National Certifications, all guided by qualified teachers and structured systems (Ferrer, 2022; Benítez et al., 2022; Arban et al., 2024; DepEd Order No. 21, s. 2019; DepEd, 2020). However, in real settings, students often stay passive during demonstrations, have limited chances for repeated skill practice, and lack structured ways for peer learning. These issues weaken social learning and slow skill mastery (Malone, 2019). Flipped mastery instruction helps close this gap by moving foundational concepts and procedures to pre-class videos and readings. As a result, the limited lab or face-to-face time is mainly used for active, repeated, and team-based practice of specific FBS tasks, like welcoming guests, taking orders, or providing table service, with ongoing feedback until each student achieves competency (Hoftijzer et al., 2022; Majumdar et al., 2020). This method applies social learning theory by having students observe, imitate, model, and improve behaviors together in real work-like environments. Consequently, the classroom experience better aligns with the TVL track's goal of preparing graduates who are both socially and technically skilled for the hospitality industry (Vallesteros, 2022; Masigan, 2019; Montes et al., 2020).

The main goal of this study is to examine the factors leading to TVL–FBS students' lack of practical skills and social learning compared to curriculum and industry standards, and to find strategies, such as flipped mastery instruction, that can help address these gaps.

II . THEORETICAL BACKGROUND

The following theories and legal foundations support the research study, which investigates the effectiveness of Flipped Mastery Instruction to improve social learning processes in Food and Beverage Services classes at Senior High School TVL Tracks.

1) Theoretical Foundations of Flipped Mastery Instruction

* *Constructivism* - posits that learners construct knowledge through direct experiences. The flipped classroom model requires students to study educational materials before class, allowing them to engage in active learning and group work during class to better understand the material.

Social constructivism - emphasizes the importance of social interaction in the learning process. Flipped mastery instruction incorporates group activities and peer teaching, enabling students to work together and develop their social skills through shared learning experiences.

In mastery learning, students must demonstrate a complete understanding of current material before progressing to new content. Flipped mastery instruction allows students to study at their preferred pace until achieving mastery, resulting in more effective learning.

Connectivism establishes that learning processes depend on network connections and social relationships between people. Flipped classrooms enable students to work with multiple educational resources while collaborating with their classmates, helping them better understand course material.

2) Legal Foundations

Educational policies that promote innovative teaching methods, along with skills development requirements, facilitate the adoption of flipped mastery instruction in Senior High School TVL track Food and Beverage Services classes.

The Enhanced Basic Education Act of 2013 (K-12 Law) promotes improved basic education by developing curricula that meet 21st-century learning needs. The Food and Beverage Services industry at Flipped Mastery System allows students to practice their skills through Italian wine-and-food service training.

The TVL Track Curriculum is designed to provide students with industry-standard technical and vocational skills. The Food and Beverage Service Department benefits from flipped mastery instruction because it gives students extra time to practice their skills during training. Department of Education (DepEd) Orders on curriculum implementation set guidelines for curriculum design, teaching methods, and assessment. These policies support learning improvements through innovative techniques, including flipped classrooms.

III.RESEARCH METHODS

The researchers employed a quantitative descriptive-inferential research design to examine how flipped mastery instruction influenced social learning processes in Senior High School TVL Food and Beverage Services classes. The study focused on students who experienced flipped mastery teaching in their Food and Beverage Services classes to assess their social learning behaviors, perceptions of the flipped mastery components, and peer collaboration readiness.

Instrument

The research used structured 5-point Likert-type questionnaires with three main sections. The first section assessed social learning behaviors, such as resource sharing, collaborative norms, and peer support and conflict resolution, with response options from "Never" to "Very Often." The second section evaluated students' comprehension of key aspects of flipped mastery instruction through class activities, teacher support, mastery-based learning, peer-teaching opportunities, direct feedback, and personalized learning paths, using a scale from "Strongly Disagree" to "Strongly Agree." The third section gauged students' readiness to collaborate during Food and Beverage Services tasks by assessing increased hands-on time, shared goals, teacher support, customized learning, communication skills, and peer teaching and skill development, all rated on a scale from "Strongly Disagree" to "Strongly Agree."

Data Analysis

Descriptive and inferential statistics were used to analyze data from students' responses, which had been encoded and processed. The overall social learning behavior levels, perceived flipped mastery aspect effectiveness, and collaboration willingness were measured using item and grouped-variable assessments, with descriptive statistics producing means and standard deviations. The research team conducted one-sample t-tests for each grouped variable, which matched the three research questions, to test whether students rated their responses above the neutral midpoint of 3.00, which represented "sometimes" or "neutral," and used a significance threshold of 0.05. The t-values and p-values obtained ($p < .001$ for all main variables) indicated that mean scores exceeded 3.00, indicating that students typically engaged in positive social learning behaviors and affirmed all fundamental components of flipped mastery instruction, while showing a high willingness to collaborate in Food and Beverage Services activities.

IV. RESULT AND DISCUSSION

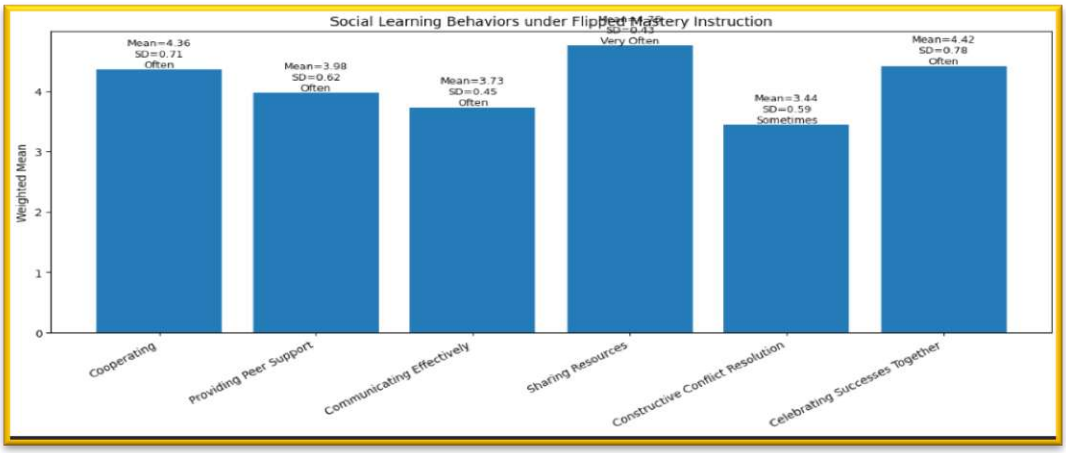
This part presents the results of our study, focusing on the impact of flipped mastery instruction on enhancing social learning dynamics.

Research Question #1: What specific social learning behaviors are observed among students using flipped mastery instruction in Food and Beverage Services?

Figure 1 shows the specific learning behaviours observed among students using flipped mastery instruction in Food and Beverage Services.

The graph indicates that flipped mastery instruction includes six social learning behaviors, which students practice at moderate to high levels, as shown by their average scores ranging from 3.4 to 4.4 on the five-point Likert scale. Students in the flipped mastery environment share materials and information through resource sharing, which received the highest mean score at "very often" usage. The collaborative norms and peer support among students are well established, as demonstrated by their success through common activities that occur "often." Students working together sometimes need help because they struggle to manage conflicts, as evidenced by the need for support to resolve their disagreements. https://researchbasics.education.uconn.edu/likert_scales/

Figure 1. Specific Learning Behaviors among students using Flipped Mastery instruction in Food and Beverage Services.



Legend: 4.20 - 5.00 – Very Often , 3.40 – 4.19 Often . 2.60 – 3.39 Sometimes, 1.80 – 2.59 Rarely, 1.00 – 1.79 Never

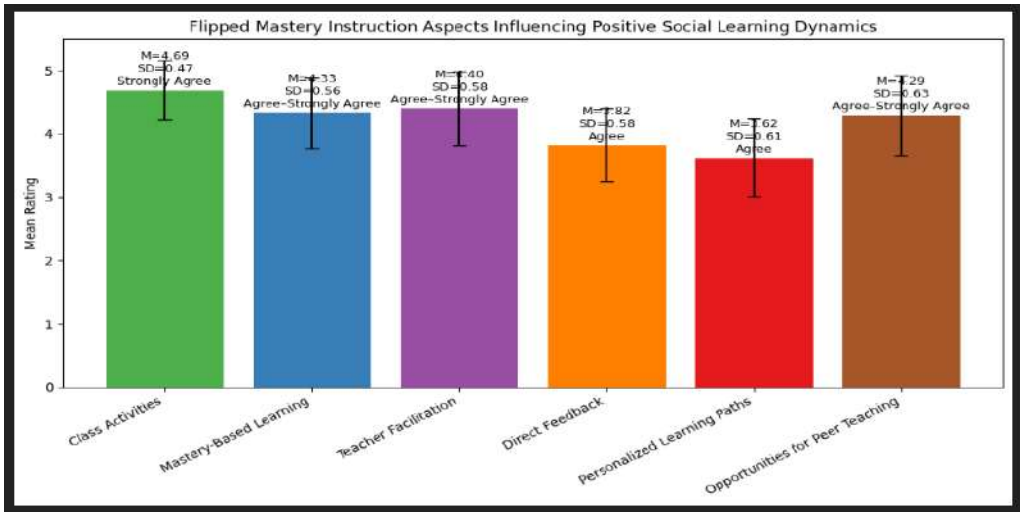
The research shows that teachers who use flipped mastery teaching methods can enhance their collaborative work and resource-sharing activities by allocating time for students to engage in dialogue and receive feedback, as well as to solve problems with their peers. It also indicates that students need direct instruction in negotiation skills, empathy development, and communication techniques, including role-plays and guided discussions, because these skills help them resolve conflicts through learning rather than viewing them as barriers to their progress.
https://www.heartwisesupport.org/post/the-role-of-peer-social-groups-in-enhancing-communication-and-interaction-skills.

Research Question #2: What aspects of flipped mastery instruction most influence the development of positive social learning dynamics in Senior High School TVL Food and Beverage Services classes?

The Aspect of Flipped Mastery Instruction that influences the development of positive social learning dynamics in Senior High School TVL Food and Beverage Service is displayed in Figure 2.

The figure displays the average scores and standard deviations for various aspects of flipped mastery instruction that influence positive social learning among Senior High School TVL Food and Beverage Services students. Class Activities received the highest average score (M = 4.69, SD = 0.47), indicating Strongly Agree, which suggests that interactive and collaborative activities are most effective in fostering positive social learning. Teacher Facilitation (M = 4.40, SD = 0.58), Mastery-Based Learning (M = 4.33, SD = 0.56), and Opportunities for Peer Teaching (M = 4.29, SD = 0.63) were rated as Agree to Strongly Agree, highlighting the importance of guided instruction, mastery of skills, and peer interaction. Direct Feedback (M = 3.82, SD = 0.58) and Personalized Learning Paths (M = 3.62, SD = 0.61) received ratings of Agree, indicating that while these factors positively influence social learning, their impact is somewhat lower.

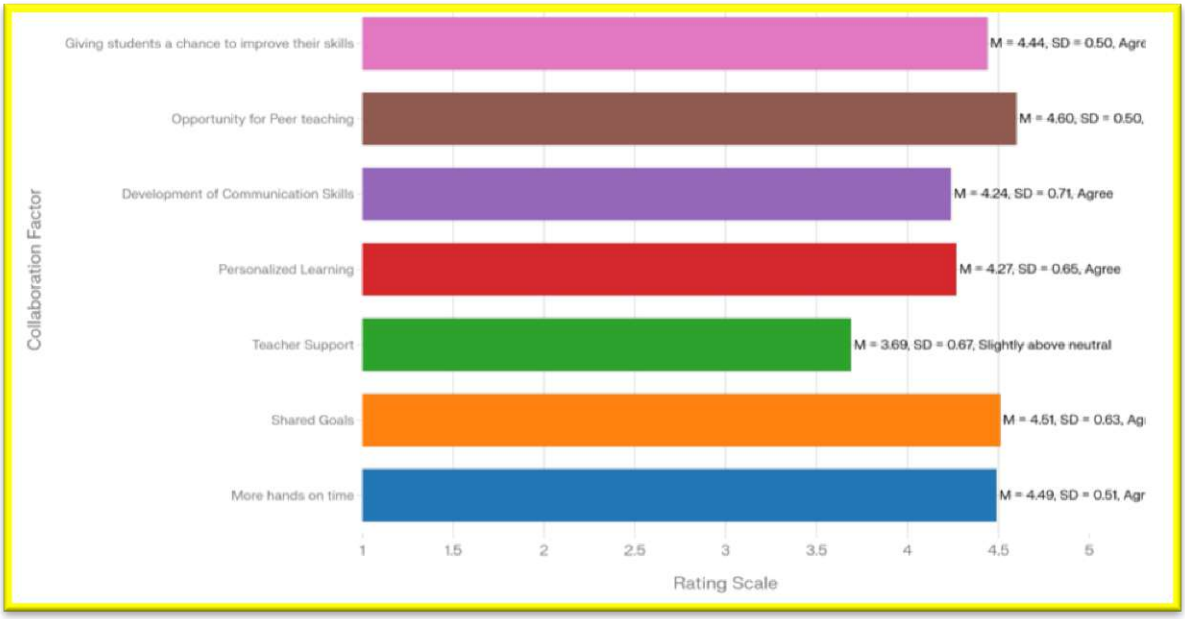
Figure 2. Aspects of Flipped Mastery Instruction that Influence the development of positive social learning dynamics in Senior High Schools: TVL Food and Beverage Service.



Legend: 4.20 - 5.00 – Strongly agree, 3.40 – 4.19 Agree 2.60 – 3.39 Neutral, 1.80 – 2.59 Disagree, 1.00 – 1.79 Strongly Disagree

Research Question #3: To what extent does flipped mastery instruction improve students' willingness to collaborate with their classmates during Food and Beverage Services activities?
Figure 3 presents the distribution of student responses regarding their willingness to collaborate with their class during Food and Beverage Services activities.

Figure 3. Distribution of students' responses regarding their willingness to collaborate with their class during Food and Beverage Services activities



Legend: 4.20 - 5.00 – Strongly agree, 3.40 – 4.19 Agree . 2.60 – 3.39 Neutral, 1.80 – 2.59 Disagree, 1.00 – 1.79 Strongly Disagree

The results show that flipped mastery instruction leads to strong positive outcomes because students become more enthusiastic about collaborating during Food and Beverage Services activities. Participants in this study reported high average scores on most collaboration factors, as they believed this teaching method helped them work more effectively with classmates. For example, Opportunity for Peer Teaching received a score of 4.60, their highest agreement level, with a 0.50-point margin. Students at this institution highly value learning through direct peer interaction. Shared Goals (M = 4.51, SD = 0.63) and More Hands-on Time (M = 4.49, SD = 0.51) also received high ratings, both as Strongly Agree. The study indicates that students collaborate more effectively when they work toward shared goals and have enough time for hands-on activities.

The results revealed three factors that promote collaborative learning. Students set their own learning pace and developed communication skills to better engage with their peers. The lowest average score was for Teacher Support, at 3.69 points with a standard deviation of 0.67, indicating that while students required teacher assistance, they also valued peer interaction in their flipped mastery environment. Overall, the findings show that flipped mastery instruction encourages students to collaborate by motivating them to teach peers and share responsibilities.

Summary of One-Sample t-test.

The summary table indicates that, across all three research questions, students' ratings remain above the neutral midpoint of 3.00 on the 5-point scale. For Research Question 1, all six social learning behaviors have means between approximately 3.40 and 4.40 and t values roughly between 6 and 15, with p values below .001. This demonstrates that students participate in behaviors such as resource sharing, peer support, and collaborative norms at frequencies that surpass their usual "sometimes" level and approach "often" and "very often" levels.

The six aspects of flipped mastery instruction highlight their most essential design elements through Class Activities, Teacher Facilitation, Mastery-Based Learning, and Opportunities for Peer Teaching. These elements have mean scores between 3.62 and 4.69, with t-values exceeding 7 and reaching up to 25. The p-value of less than .001 confirms that students agree these design features create social learning environments that enhance learning outcomes. Students demonstrate a positive attitude toward group work through seven indicators of Work Together willingness, with mean scores from 3.69 to 4.60 and t-values from 6.92 to 21.66, all at $p < .001$. The evidence indicates that flipped mastery instruction fosters social learning behaviors and improves instructional quality, leading to increased student collaboration in Food and Beverage Services classes.

Table 1. Summary of one-sample t tests for the three research questions

Research Question	Variable / Aspect (grouped)	Mean range	Typical t range (df ≈ 44)	p (2-tailed)	Decision vs. 3.00	Interpretation
RQ1 – Social RQ1learning behaviors	Six behaviors (resource sharing, collaborative norms, peer support, conflict handling, etc.)	3.40–4.40	t ≈ 6 to 15	< .001	All significantly > 3.00	Students engage in these social learning behaviors significantly more than "sometimes/neutral" (they occur Often–Very Often).
RQ2 – Aspects of flipped mastery	Class Activities, Teacher Facilitation, Mastery-Based Learning, Opportunities for Peer Teaching, Direct Feedback, Personalized Learning Paths	3.62–4.69	t ≈ 7 to 25	< .001	All significantly > 3.00	All aspects are rated clearly positive; Class Activities has the strongest effect, followed by Teacher Facilitation, Mastery-Based Learning, and Peer Teaching.
RQ3 – Willingness to collaborate	More Hands-on Time, Shared Goals, Teacher Support, Personalized Learning, Communication Skills, Peer Teaching, Improving Skills	3.69–4.60	t = 6.92 to 21.66	< .001	All significantly > 3.00	Students' willingness to collaborate is well above neutral across all indicators, especially for Opportunity for Peer Teaching, Shared Goals, and Hands-on Time

V. CONCLUSION

The study results show that flipped mastery-based teaching methods lead to better social learning outcomes in Senior High School TVL Food and Beverage Services programs. Students develop social learning skills through their activities, which include sharing resources, establishing collaborative norms, supporting peers, and solving problems together. The students demonstrate excellent classroom conduct when applying the flipped mastery system. The study findings indicate that learners see all the design elements of flipped mastery—which include interactive classroom activities, effective teacher guidance, mastery progression, and peer teaching—as key factors that create a learning environment promoting collaboration and student support. Students showed strong interest in working together during Food and Beverage Services activities, which required them to achieve shared goals through hands-on practice and peer teaching, organized through designated opportunities. The evidence suggests that flipped mastery teaching methods help students develop technical skills, increase active learning, and build relationships with classmates, supporting the TVL-FBS program's goal of cultivating socially and technically skilled hospitality professional graduates.

VI. RECOMMENDATIONS

The study findings indicate that three main recommendations should be applied across three areas of practice and policy, as well as future research efforts. Food and Beverage Services teachers who instruct the TVL track should adopt flipped mastery methods by requiring students to complete all pre-class work, including videos, readings, and demonstrations, before starting their in-class activities that involve guided teamwork and practical exercises, which help students reach competency goals. Teachers should create learning activities that enable students to share resources, teach their peers, and solve problems collaboratively, while also teaching conflict resolution, communication, and empathy skills to help them manage relationships with others. School

administrators need to develop professional development programs that support teachers in designing flipped mastery lessons, creating quality pre-class materials, and developing assessment tools to measure mastery and social learning outcomes. School and division policies should promote flipped and mastery-based teaching methods as effective strategies for TVL classes that require specialized skills in Food and Beverage Services. Researchers working on this study should expand their work to include other TVL strands, schools, and grade levels, using larger participant groups and mixed-methods research that combines classroom and home observations with surveys to understand how flipped mastery methods influence students' social behaviors and academic performance in real-world workplace settings.

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