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MISMATCH BETWEEN EDUCATIONAL CURRICULUM AND INDUSTRY SKILL DEMANDS: BASIS FOR AN INTERVENTION PLAN

Arjay Balada [1]
Nomelita Lo

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Original research

A B S T R A C T

This study aimed to determine the mismatch between the skills taught to students and the industry skill demands in the Province of Camarines Norte. The study employed descriptive-inferential research design with survey questionnaire checklist as the data-gathering instrument. Twenty-five (25) public senior high school teachers, fifteen (15) private senior high school teachers, eight (8) secondary school principals, two (2) assistant principals from different public schools in Mercedes and Daet District, four (4) school principals from different private schools in Daet, and nine (9) human resource executives from the ICT and food industries in the province were included as study respondents. Based on the findings, it is concluded that the profile of the respondents varied in terms of age, sex, and position. Also, non-technical skills and behavioral skills were always taught while ICT technical skills and food technical skills were often taught. Moreover, non-technical skills and behavioral skills were always sought while ICT technical skills and food technical skills were often sought. There was no significant difference between the skills taught and the skills sought under non-technical skills, technical ICT skills, and behavioral skills, while there was a significant difference under food industry technical skills. An intervention plan is therefore proposed to bridge the gap between the TVL tracks offered in schools and the needed competencies in the industry specifically in the ICT and food industry.

1. INTRODUCTION

According to Gammarano (2022), more than 935 million workers globally had jobs that did not match their educational level. Of these workers, 72% (677 million) were under-educated for their jobs, while the remaining 28% (258 million) were over-educated. Since only 114 nations were included, the actual worldwide numbers were most likely significantly higher.

Section 2 of Republic Act No. 11448 declared the policy of the State to provide quality education that is relevant to the changing needs of the people and society. The State acknowledged that the rapid changes brought about by globalization – such as the opening up of trade in products and services and the growing use of ICTs – had fostered an environment that is conducive to teaching and learning across national boundaries. In this light, the State endeavored to modernize the Philippine higher education sector and bring international quality standards and expertise into the country, to make higher education globally competitive, attract a flow of talented students, faculty, and staff, and to improve the country's human resource base for national advancement.

Saong et al. (2023) also argued that ensuring all students acquire the skills required to adapt to the rapidly changing conditions and demands of the labor market is

[1] Corresponding author: Arjay Balada
Email: arjay.balada@deped.gov.ph

one of the main objectives of Higher Education Institutions (HEIs). Universities needed to think about how they prepare their graduates to be employable. Higher education institutions needed to equip students to work in jobs that did not yet exist, use cutting-edge technologies, and find solutions to challenges no one had thought of. However, there was some debate about whether university courses adequately prepare students for 21st-century workplace skills to prepare them for the real contexts involved in their professional practice.

In the Philippines, experts and professionals crafted the "Enhanced Basic Education Act of 2013," also known as the K-12 program, which applied to both public and private educational institutions. The K-12 program's primary goal was to produce 21st-century graduates equipped with the core values and lifelong competencies they need to contribute to societal development and nation-building. However, a decline in the returns on education and a growing gap between required and provided skills, knowledge, and abilities led to an educational mismatch.

The in-service training (INSET) conducted by the Mercedes District, Division of Camarines Norte, in February 6-10, 2022, at Mercedes High School, highlighted the mismatch between teachers' fields of specialization and the subjects they teach. Music, Arts, Physical Education, and Health (MAPEH) teachers from various Mercedes District secondary schools expressed their concerns about the need for qualified music teachers, the difficulties of teaching music without a music major, and the challenges of dealing with prescribed music competencies when they were assigned to teach music by their school heads.

While numerous studies have investigated the education-skills mismatch, this study aimed to identify the mismatch between the skills taught in Grade 12 Senior High School (SHS) under the Technical-Vocational Livelihood (TVL) track's ICT and Home Economics strand programs and the local job skill demands in the Province of Camarines Norte.

2. LITERATURE REVIEW

In the study of Bischof (2021), several studies suggest that skill mismatch reduces job satisfaction. To date, research has primarily investigated the impact of subjective skill mismatch; the impact of objective skill mismatch has less commonly been analyzed and has generally only focused on mismatches in single skills. The purpose of this study is to determine whether employee job satisfaction is impacted by both subjective and objective skill mismatch. Tushar and Sooraksa, (2023) conducted a semi-systematic literature review of research of employability to identify essential employability skills that employers seek in recent graduates. The comprehensive analysis of the existing literature review aims to present a set of global employability skills, identify similarities, variations, or changes in these skills across time, and explore the most relevant existing employability skills for the 21st-century workplace. Pater et al. (2022) analyzed labor demand and mismatch for educational traits in information and communication technology (ICT) occupations, taking into account the areas of education, occupations, and skills in demand, and the supply of labor. Reang and Mohalik (2023), ICT competency in education increases learning opportunities, nurtures critical thinking and collaboration, encourages active participation, and prepares students for the digital era. The study set out to find out how proficient secondary school teachers were with ICT.

3. METHODOLOGY

This study used descriptive-inferential statistics within a quantitative design. The descriptive method was relevant in describing a set of data collected from a larger group (secondary public schools, private SHS, ICT industry, and food industry in the province) using the data collected from a small part of the population (the public and private SHS teachers and school heads in Mercedes and Daet District, human executives of ICT and Food industries in Daet, Camarines Norte). Meanwhile, the inferential design was used in the discussion of the difference between the skills taught to Grade 12 SHS students, the industry skill demands for employment and the possible interventions to be proposed to bridge the gap between skills taught to Grade 12 students and industry skills demands.

Twenty-five (25) public senior high school teachers, fifteen (15) private senior high school teachers, eight (8) secondary school principals, two (2) assistant principals from different public schools in Mercedes and Daet District, and four (4) school principals from different private schools in Daet were chosen as study respondents due to their expertise and knowledge of the K–12 curriculum and the subject taught to SHS Grade 12 students. On the other hand, nine (9) human resource executive from the ICT and food industries in the province were also included as study respondents due to their familiarity with the skills demanded by such industries. The data collected for this research were limited to the K–12 graduates of SY 2022–2023 and the school year 2023–2024 only.

The researcher obtained permission from relevant authorities including school officials and industry HR departments to gather data through surveys. A pilot test was conducted to refine the questionnaire, which then collected information on respondents' profiles. Data was organized and analyzed statistically. Importantly, ethical considerations were prioritized throughout the process. This included obtaining informed consent, guaranteeing anonymity, and respecting respondents' rights to privacy, withdrawal, and declining questions. Clear communication and respect for participants' time were maintained during the data gathering phase.

The statistical tools employed in the treatment of the data were the weighted mean and one-way ANOVA. The

weighted mean was used in the statistical treatment of data in Problem 1 on skills taught to Grade 12 students, including non-technical, technical, and behavioral skills, and in Problem 2 on industry skill demands for employment. Computations were made using Microsoft Excel and Simplified Statistics for Researchers (SSR) software. Additionally, one-way ANOVA was employed to determine whether there were any statistically significant differences between variables in Problem 3 regarding the significant difference between the academic staff's and the employer's opinions.

4. RESULTS AND DISCUSSIONS

This part presents the results of the data analysis in response to the problems covered by this study.

4.1 Skills Taught to Grade 12 SHS along Non-Technical Skills

Table 1 illustrates the non-technical skills taught to Grade 12 SHS students. Each skill is divided into sub-indicators, with their weighted means and interpretations provided. For instance, social skills, creative skills, and communication skills have a weighted mean of 3.8 highest among other non-technical skills taught to Grade 12 SHS students. Meanwhile, time management skills which include always on time and identify and plan daily tasks, create work plans to meet deadlines, know what to prioritize have a least weighted mean of 3.6. The general weighted mean for non-technical skills taught to Grade 12 students is 3.7, which is interpreted as "Always Taught Skills" (ATS).

Table 1. Skills Taught to Grade 12 SHS Students along Non-Technical Skills

Non-Technical Skills	Sub-indicators	*Weighted Mean*	*Interpretation*
Critical thinking skills	(1) Notice and predict opportunities, problems and solutions.	3.7	ATS
	(2) Understand and interpret data and other information.	3.7	ATS
	(3) Draw conclusions based on relevant data & information.	3.7	ATS
	Sub Weighted Average	***3.7***	ATS
Creativity skills	(1) Think about a task or a problem in a new or different way	3.8	ATS
	(2) Use the imagination to generate new ideas.	3.8	ATS
	(3) Find connections between different ideas to solve problems.	3.8	ATS
	Sub Weighted Average	***3.8***	ATS
Collaboration Skills	(1) Recognize others' contributions.	3.8	ATS
	(2) Identify obstacles and address problems cooperatively.	3.6	ATS
	(3) Place group goals above personal satisfaction &recognition.	3.7	ATS
	Sub Weighted Average	***3.7***	ATS
Communication skills	(1) Use a strong, confident speaking voice.	3.7	ATS
	(2) Make them clear and easy-to-understand	3.8	ATS
	(3) Use active listening	3.8	ATS
	Sub Weighted Average	***3.8***	ATS
Information Literacy Skills	(1) Discern which sources are credible.	3.8	ATS
	(2) Finding and using quality information	3.7	ATS
	(3) Proper use of keywords and using quality databases	3.7	ATS
	Sub Weighted Average	***3.7***	ATS
Leadership skills	(1) Think less about themselves and more about how to make their team successful.	3.6	ATS
	(2) Stay calm and identifying a step-by-step solution in every problem.	3.6	ATS
	(3) Behaving honorably, even when no one is watching.	3.7	ATS
	Sub Weighted Average	***3.6***	ATS
Social Skills	(1) Know when and how to initiate communication and respond.	3.7	ATS
	(2) Maintain healthy relationships and build key connections.	3.8	ATS
	(3) Pay close attention to a person who is communicating with you.	3.8	ATS
	Sub Weighted Average	***3.8***	ATS
Interpersonal skills	(1) Able to consciously know what they're feeling and why they're feeling it	3.7	ATS
	(2) Overlooked bridge between yourself and others	3.6	ATS
	(3) Recognize the difference between receiving feedback & criticism.	3.8	ATS
	Sub Weighted Average	***3.7***	ATS
Time management skills	(1) Always on time and identify and plan daily tasks	3.6	ATS
	(2) Create work plans to meet deadlines	3.6	ATS
	(3) Know what to prioritize.	3.7	ATS
	Sub Weighted Average	***3.6***	ATS
	Overall Weighted Average	**3.7**	

Legend (for Skills Taught)*:* 3.25-4.00 - Always Taught Skills (ATS); 2.50-3.24 - Often Taught Skills (OTS); 1.75-2.49 - Rarely Taught Skills (RTS); 1.00-1.74 - Not Taught Skills (NTS)

The analysis of data suggests that the curriculum successfully equips Grade 12 students with crucial 21st-century skills like communication, creativity, and social skills. These are constantly integrated into various programs and activities by teachers. This aligns with the emphasis on communication in complex projects by Kolakowski (2019) and the importance of daily creative and communication skills highlighted by Chiruguru (2020). Paroginog et al. (2018) further emphasize the need for social skill development, solidifying the well-rounded approach to preparing students for the job market. On the other hand, the analysis identified weaker time management skills among students compared to other non-technical skills. This suggests that students may not be effectively applying time management principles in their daily routines, potentially struggling

with task planning and prioritization. This aligns with research by Briones et al. (2019) which found a link between time management and academic performance. Students who dedicate more time to studies outperform those who do not, highlighting the negative impact of poor time management on academic success.

4.2 Skills taught to grade 12 SHS students along technical skills: ICT

Table 2 presents the skills taught to Grade 12 students, categorized as ICT technical skills. Each skill is further categorized into sub-indicators, with weighted means and interpretations provided. For instance, MS Word processing skills for Grade 12 students have a weighted mean of 3.6. In contrast, computer programming skills for Grade 12 students score 2.2, which is least among other ICT technical skills. The general weighted mean for ICT technical skills taught to Grade 12 students is 2.9, indicating these skills are often taught.

Table 2. Skills Taught to Grade 12 SHS Students along Technical Skills: ICT

Technical Skills (ICT)	Sub-indicators	*Weighted mean*	*Interpretation*
Animation	(1) Use the animator keys for clean-up drawings (realistic)	2.6	OTS
	(2) Produce clean-up drawings (realistic) based on the models	2.5	OTS
	(3) Arrange the animation breakdown for clean-up	2.6	OTS
	Sub Weighted Average	*2.6*	OTS
Computer Programming	(1) Apply basic Java language	2.2	RTS
	(2) Apply basics of Java class design	2.2	RTS
	(3) Monitor operating system performance	2.3	RTS
	Sub Weighted Average	*2.2*	RTS
Spreadsheets	(1) Define basic spreadsheet terminology	3.2	OTS
	(2) Format data: font, size, color, and style	3.3	OTS
	(3) Calculate data using formulas	3.3	OTS
	Sub Weighted Average	*3.3*	OTS
MS Word Processing	(1) Creating, formatting, and sharing word documents	3.7	ATS
	(2) Using page setup, fonts, headers, and paragraphs	3.6	ATS
	(3) Inserting images, bookmarks, tables, graphs, and charts.	3.6	ATS
	Sub Weighted Average	*3.6*	ATS
Computer Systems Servicing Skills	(1) Select appropriate hardware and software according to task assigned and required outcome	2.9	OTS
	(2) Check computer systems and networks for maintenance.	2.7	OTS
	(c) Assemble and disassemble computer hardware	2.8	OTS
	Sub Weighted Average	*2.8*	OTS
	Overall Weighted Average	**2.9**	

Legend (For Skills Taught): *3.25-4.00 - Always Taught Skills (ATS); 2.50-3.24 - Often Taught Skills (OTS); 1.75-2.49 - Rarely Taught Skills (RTS); 1.00-1.74 - Not Taught Skills (NTS)*

This study found that MS Word processing is considered a fundamental skill for Grade 12 SHS students, with the expectation that they can utilize it effectively. However, some students might still struggle despite this focus. This aligns with research by Guino et al. (2019) which showed limited advanced skills in basic applications. In contrast, computer programming received a lower emphasis and showed lower student proficiency. This suggests a need for stronger teacher technical skills and potentially a lack of resources or effective teaching methods. Research by Cheah (2020) supports the inherent difficulty of computer programming, potentially contributing to these findings.

4.3 Skills taught to grade 12 students' along technical skills: food processing and cookery

Table 3. presents the skills taught to Grade 12 students along food processing and cookery technical skills. Also, it provides weighted means, and interpretations for each skills' sub-indicators. For skills taught to Grade 12 students, sanitizing procedure is an often-taught skill with a weighted mean of 3.0, while food knowledge and menu preparation has a similar weighted mean of 2.7 and least among other technical skills taught. The general weighted average for technical skills taught to Grade 12 students is 2.8, indicating that these skills are often taught.

The findings showed a focus on food sanitation, with students learning about proper procedures, hygiene practices, and waste management. This aligns with research indicating food sanitation goes beyond cleanliness and encompasses preventing foodborne illness (Borbon and Tolentino, 2020). However, skills in other areas, like menu planning and food storage, received lower scores. This suggests a potential gap between what is taught and practical application, possibly due to resource limitations or a lack of curriculum emphasis on these areas. The study also highlights potential inconsistencies in schools' adherence to national competency standards, and supports prior research suggesting the K-12 curriculum may lack dedicated space for comprehensive food safety education (Limon et al., 2021).

Table 3. Skills Taught to Grade 12 SHS along Technical Skills: Food Processing and Cookery

Technical Skills (Food)	Sub-indicators	*Weighted mean*	*Interpretation*
Food preparation	(1) sanitizing kitchens and work areas, including equipment, dishes, utensils and silverware.	2.9	OTS
	(2) dicing vegetables and making cold food items, like salads and other raw dishes.	2.7	OTS
	(3) measuring and weighing ingredients, such as meats and cheeses.	2.7	OTS
	Sub Weighted Average	*2.8*	OTS
Food knowledge	(1) storing and organizing food into specific containers to ensure the freshness and preservation of ingredients	2.8	OTS
	(2) evaluating and recording the temperature of foods and food storage areas	2.6	OTS
	(3) grinding and cutting meats, seafood and poultry for chefs to cook and serve	2.7	OTS
	Sub Weighted Average	*2.7*	OTS
Operating kitchen equipment	(1) carry out periodic inspection, cleaning, and equipment servicing	2.7	OTS
	(2) quickly understand and carry out both written and oral instructions in operating kitchen equipment.	2.8	OTS
	(3) wash materials according to required specifications.	2.8	OTS
	Sub Weighted Average	*2.8*	OTS
Menu preparation	(1) assessing customer preferences	2.7	OTS
	(2) food budgeting skills	2.7	OTS
	(3) nutritional knowledge	2.7	OTS
	Sub Weighted Average	*2.7*	OTS
Sanitizing Procedure	(1) follow all safety procedures and understand the risks associated with certain tasks.	3.1	OTS
	(2) good cleaning skills and keep their workspaces sanitary and comfortable for others.	3.0	OTS
	(c) understanding safety procedures, hazardous materials handling, and waste management.	3.0	OTS
	Sub Weighted Average	*3.0*	OTS
	Overall Weighted Average	**2.8**	

***Legend (for Skills Taught)**: 3.25-4.00 - Always Taught Skills (ATS); 2.50-3.24 - Often Taught Skills (OTS); 1.75-2.49 - Rarely Taught Skills (RTS); 1.00-1.74 - Not Taught Skills (NTS)*

4.4 Skills taught to grade 12 SHS along behavioral skills

Table 4 presents the weighted means and interpretations for the sub-indicators of each behavioral skill taught to Grade 12 students. For honesty skills which includes "self-aware and honest with oneself, able to communicate honestly and openly, and honest in all interactions," the weighed mean is 3.8, which was the highest among other behavioral skills, while stress management, self-management, and persistence skills taught to Grade 12 students have a weighted mean of 3.6 and got the lowest mean among other behavioral skills. The general weighted average for behavioral skills taught to Grade 12 students is 3.7, indicating that these skills are always taught.

Table 4. Skills Taught to Grade 12 SHS along Behavioral Skills

Behavioral Skills	Sub-indicators	*Weighted mean*	*Interpretation*
Stress management	(1) recognizing and understanding one's own stress triggers and responses.	3.7	ATS
	(2) having a repertoire of healthy coping mechanisms to deal with stress.	3.5	ATS
	(3) managing time efficiently to avoid feeling overwhelmed	3.6	ATS
	Sub Weighted Average	*3.6*	ATS
Self-management	(1) efficiently planning and organizing tasks to meet deadlines	3.6	ATS
	(2) demonstrating flexibility in the face of changing circumstances.	3.6	ATS
	(3) taking practical steps to achieve objectives without constant supervision.	3.6	ATS
	Sub Weighted Average	*3.6*	ATS
Self-esteem	(1) engaging in positive and affirming internal dialogue.	3.7	ATS
	(2) believing in own abilities and capacities.	3.7	ATS
	(3) feeling comfortable making decisions independently.	3.7	ATS
	Sub Weighted Average	*3.7*	ATS
Persistence	(1) identify current and future needs, setting goals, and defining success.	3.6	ATS
	(2) invest physical and mental energy to overcome challenges and achieve success.	3.6	ATS
	(3) open oneself to learning and show genuine interest.	3.6	ATS
	Sub Weighted Average	*3.6*	ATS
Initiative	(1) assess a situation and take action without direction from someone else.	3.7	ATS
	(2) skilled in initiating conflict resolution.	3.7	ATS
	(3) positive about decisions and to take action without hesitation.	3.7	ATS
	Sub Weighted Average	*3.7*	ATS
Honesty	(1) self-aware and honest with oneself.	3.8	ATS
	(2) able to communicate honestly and openly.	3.8	ATS
	(3) honest in all interactions.	3.8	ATS
	Sub Weighted Average	*3.8*	ATS
Flexibility	(1) ability to adapt to a new situations, changes and challenges with ease	3.8	ATS

	(2) manage unexpected circumstances	3.6	ATS
	(3) overcome limitations where possible	3.6	ATS
	Sub Weighted Average	*3.7*	ATS
Decision making	(1) ability to choose solutions to challenges.	3.7	ATS
	(2) able to factor different viewpoints in order to make a thoughtful decision.	3.6	ATS
	(3) think the advantages & disadvantages of every possible solution before making decision.	3.7	ATS
	Sub Weighted Average	*3.7*	ATS
Asking questions	(1) able to make observations and ask questions about certain situations.	3.7	ATS
	(2) ask specific questions as often	3.7	ATS
	(3) use the appropriate language and tone when asking question.	3.7	ATS
	Sub Weighted Average	*3.7*	ATS
	Overall Weighted Average	**3.7**	

Legend (for Skills Taught)*: 3.25-4.00 - Always Taught Skills (ATS); 2.50-3.24 - Often Taught Skills (OTS); 1.75-2.49 - Rarely Taught Skills (RTS); 1.00-1.74 - Not Taught Skills (NTS)*

The study found positive development in students' honesty, suggesting effective integration of 21st-century behavioral skills by SHS teachers. However, there is room for improvement in stress management, self-management, and persistence skills. This aligns with previous research by Tawiah et al. (2022) on honesty and by Donguines et al. (2021) on student stress. The lower scores suggest a need for continued focus on developing coping mechanisms, time management, goal setting, and perseverance. This is further supported by research by Thompson et al. (2013) and Polirstok (2017) which highlight the ongoing efforts of SHS teachers in addressing student behavioral diversity and the need for further development in managing stress, planning, and goal setting.

4.5 Industry skills demand along nontechnical skills

Table 5 illustrates the industry skills demand for employment along non-technical skills. Each skill is divided into sub-indicators, and their weighted means, interpretation were provided. Communication skills for instance, have the highest weighted mean of 3.9, and alongside interpretation is always skill demands. Communication skills such as use a strong, confident speaking voice, make them clear and easy-to-understand, and use active listening, has a similar weighted mean of 3.9. Meanwhile, interpersonal skills have the lowest weighted mean of 3.2, interpreted as often skill demands. The general weighted average for non-technical demand skills for employment is 3.6 indicating that these skills are always sought by the industry.

Table 5. Industry Skills Demand along Non-Technical Skills

Non-Technical Skills	Sub-indicators	*Weighted mean*	*Interpretation*
Critical thinking skills	(1) Notice and predict opportunities, problems and solutions.	3.8	ASD
	(2) Understand and interpret data and other information.	3.9	ASD
	(3) Draw conclusions based on relevant data & information.	3.7	ASD
	Sub Weighted Average	***3.8***	ASD
Creativity skills	(1) Think about a task or a problem in a new or different way	3.4	OSD
	(2) Use the imagination to generate new ideas.	3.6	ASD
	(3) Find connections between different ideas to solve problems.	3.9	ASD
	Sub Weighted Average	***3.6***	ASD
Collaboration Skills	(1) Recognize others' contributions.	3.6	ASD
	(2) Identify obstacles and address problems cooperatively.	3.8	ASD
	(3) Place group goals above personal satisfaction and recognition.	3.7	ASD
	Sub Weighted Average	***3.7***	ASD
Communication skills	(1) Use a strong, confident speaking voice.	3.9	ASD
	(2) Make them clear and easy-to-understand	3.9	ASD
	(3) Use active listening	3.9	ASD
	Sub Weighted Average	***3.9***	ASD
Information Literacy Skills	(1) Discern which sources are credible.	3.4	OSD
	(2) Finding and using quality information	3.4	OSD
	(3) Proper use of keywords and using quality databases	3.1	OSD
	Sub Weighted Average	***3.3***	OSD
Leadership skills	(1) Think less about themselves and more about how to make their team successful.	3.6	ASD
	(2) Stay calm and identifying a step-by-step solution in every problem.	3.6	ASD
	(3) Behaving honorably, even when no one is watching.	3.3	OSD
	Sub Weighted Average	***3.5***	ASD
Social Skills	(1) Know when and how to initiate communication and respond.	3.9	ASD
	(2) Maintain healthy relationships and build key connections.	3.6	ASD
	(3) Pay close attention to a person who is communicating with you.	3.8	ASD
	Sub Weighted Average	***3.7***	ASD
Interpersonal skills	(1) Able to consciously know what they're feeling and why they're feeling it	3.3	OSD
	(2) Overlooked bridge between yourself and others	3.1	OSD
	(3) Recognize the difference between receiving feedback and criticism.	3.1	OSD
	Sub Weighted Average	***3.2***	OSD
Time management skills	(1) Always on time and identify and plan daily tasks	3.8	ASD
	(2) Create work plans to meet deadlines	3.6	ASD
	(3) Know what to prioritize.	3.8	ASD
	Sub Weighted Average	***3.7***	ASD
	Overall Weighted Average	**3.6**	

The study found communication skills to be highly sought after in both the food and ICT industries, emphasizing the value of strong non-technical skills for employment. This suggests a need for clear, confident communication and active listening. The research is aligned with Debnath's (2023) work highlighting communication as a driver for growth in dynamic business environments. While interpersonal skills were rated slightly lower, Dasgupta (2020) emphasizes the importance of well-rounded applicants. This implies that strong communication skills can be a stepping stone, but future success may still rely on interpersonal development. Educational institutions are also recognizing this shift and incorporating these skills into curriculums to better prepare graduates for industry demands.

4.6 Industry skills demand along ICT technical skills

Table 6 presents the technical skills that the ICT industry demands for employment. Each skill is categorized into sub-indicators, with their weighted means and interpretations. ICT industry's always-demanded skill is MS word processing as it garnered the highest weighted mean of 3.7, followed by the skills in using MS excel or spreadsheet with a weighted mean of 3.3, while ICT demands skills for animation got a weighted mean of 2.5 which was least among technical skills. The general weighted average for ICT technical skills demand for employment is 3.2, indicating that these skills are often demanded by the industry.

Table 6. Industry Skills Demand along ICT Technical Skills.

Technical Skills (ICT)	Sub-indicators	*Weighted mean*	*Interpretation*
Animation	(1) Use the animator keys for clean-up drawings (realistic)	2.4	RSD
	(2) Produce clean-up drawings (realistic) based on the models	2.6	OSD
	(3) Arrange the animation breakdown for clean-up	2.4	RSD
	Sub Weighted Average	*2.5*	OSD
Computer Programming	(1) Apply basic Java language	2.8	OSD
	(2) Apply basics of Java class design	2.8	OSD
	(3) Monitor operating system performance	3.4	OSD
	Sub Weighted Average	*3.0*	OSD
Spreadsheets	(1) Define basic spreadsheet terminology	3.6	ASD
	(2) Format data: font, size, color, and style	3.6	ASD
	(3) Calculate data using formulas	3.4	OSD
	Sub Weighted Average	*3.5*	ASD
MS Word Processing	(1) Creating, formatting, and sharing word documents	3.8	ASD
	(2) Using page setup, fonts, headers, and paragraphs	3.6	ASD
	(3) Inserting images, bookmarks, tables, graphs, and charts.	3.6	ASD
	Sub Weighted Average	*3.7*	ASD
Computer Systems Servicing Skills	(1) Select appropriate hardware and software according to task assigned & required outcome	3.2	OSD
	(2) Check computer systems and networks for maintenance.	3.4	OSD
	(c) Assemble and disassemble computer hardware	3.6	ASD
	Sub Weighted Average	*3.4*	OSD
	Overall Weighted Average	**3.2**	

Legend (for Skills Demand): *(3.25-4.00) –Always Skill Demand (ASD); (2.50-3.24)-Often Skill Demand (OSD); (1.75-2.49) -Rarely Skill Demand (RSD); (1.00-1.74)-Not Skill Demand (NSD)*

The findings showed that proficiency in Microsoft Office Suite, including basic computer skills and formula usage in spreadsheets, is highly sought after by employers. These findings align with Brooke's (2021) assertion that Microsoft Office skills are a common expectation for computer-based roles. In contrast, the study found that animation skills were not in high demand, suggesting a local focus on areas like computer hardware sales, basic software installation, and computer repairs. This aligns with studies by Kamarudin and Sajilan (2018) and Yang (2023) which highlight limitations in the local animation industry and a growing emphasis on digital technologies within animation practices. The implication is that while basic computer skills and Microsoft Office proficiency are crucial for success in the local ICT industry, animation skills may be less relevant. However, a foundation in computer basics could still be beneficial for aspiring ICT professionals in the province.

4.7 Food industry technical skills demand for employment

Table 7 provides the weighted mean and interpretation for sub-indicator of technical skills demand in the food industries. The food preparation skills, food knowledge, operating the kitchen and sanitizing procedures have a similar weighted mean of 4.0, with an interpretation of always skills demand. For menu preparation which includes assessing customer preferences, nutritional knowledge and food budgeting skills, they have a weighted mean of 3.8, which is least among technical skills demand by the food industry. The general weighted average for technical skills is 3.96, indicating that these skills are often skills demand by the food industries.

Table 7. Food Industry Technical Skills Demand for Employment

Technical Skills (Food)	Sub-indicators	*Weighted mean*	*Interpretation*
Food preparation	(1) sanitizing kitchens and work areas, including equipment, dishes, utensils and silverware.	4.0	ASD
	(2) dicing vegetables and making cold food items, like salads and other raw dishes.	4.0	ASD
	(3) measuring and weighing ingredients, such as meats and cheeses.	4.0	ASD
	Sub Weighted Average	4.0	ASD
Food knowledge	(1) storing and organizing food into specific containers to ensure the freshness & preservation of ingredients	4.0	ASD
	(2) evaluating and recording the temperature of foods and food storage areas	4.0	ASD
	(3) grinding and cutting meats, seafood and poultry for chefs to cook and serve	4.0	ASD
	Sub Weighted Average	4.0	ASD
Operating kitchen equipment	(1) carry out periodic inspection, cleaning, and equipment servicing	4.0	ASD
	(2) quickly understand & carry out both written & oral instructions in operating kitchen equipment.	4.0	ASD
	(3) wash materials according to required specifications.	4.0	ASD
	Sub Weighted Average	4.0	ASD
Menu preparation	(1) assessing customer preferences	3.8	ASD
	(2) food budgeting skills	3.8	ASD
	(3) nutritional knowledge	3.8	ASD
	Sub Weighted Average	*3.8*	ASD
Sanitizing Procedure	(1) follow all safety procedures and understand the risks associated with certain tasks.	4.0	ASD
	(2) good cleaning skills and keep their workspaces sanitary and comfortable for others.	4.0	ASD
	(c) understanding safety procedures, hazardous materials handling, and waste management.	4.0	ASD
	Sub Weighted Average	4.0	ASD
	Overall Weighted Average	**3.96**	

Legend (for Skills Demand): *(3.25-4.00) –Always Skill Demand (ASD); (2.50-3.24)-Often Skill Demand (OSD); (1.75-2.49) -Rarely Skill Demand (RSD); (1.00-1.74)-Not Skill Demand (NSD)*

The study identified a demand in the province's food industries for employees with food preparation skills, encompassing knowledge of food storage, temperature control, and ingredient processing. Additionally, skills in kitchen operation, equipment maintenance, and adherence to sanitation procedures were found to be in high demand. These findings align with research by Barycki (2024) highlighting the importance of proper sanitation for food safety and business success, and Balanquit and Sanoria (2021) emphasizing the need for standardized food preparation protocols. Akyazi et al. (2020) further emphasize the ongoing need for skill development within the workforce to keep pace with technological advancements.

Despite receiving the lowest score (3.8) among technical skills in the food industry, menu preparation was categorized as "always in demand." This suggests menu preparation skills hold significant importance within the industry, including restaurants and fast-food chains. Applicants and employees with experience in assessing customer preferences, food budgeting, and nutritional knowledge may find ample opportunities and satisfaction within the food industry, particularly fast-food chains in Camarines Norte, as these skills are consistently sought after. Furthermore, research by Egan (2020) emphasizes menu planning as a learnable skill honed through experience. Effective menus are drivers of financial health in food service operations, highlighting their undeniable importance for success. In essence, menu planning empowers chefs to manage kitchens, monitor ingredients, and contribute to a restaurant's profitability.

4.8 Industry skills demand along behavioral skills

Table 8 illustrates behavioral skills demand by the ICT and food industry, and the weighted mean for each sub-indicator. Honesty skills have a weighted mean of 3.8, the highest among the skills, which means self-aware and honest with oneself, able to communicate honestly and openly, honest in all interactions. Meanwhile, self-management skills have a weighted mean of 3.4, the least among behavioral skills. The general weighted average for behavioral skills demand by the industry is 3.7, indicating that these skills are always skills demand.

Table 8. Industry Skills Demand along Behavioral Skills

Behavioral Skills	Sub-indicators	*Weighted mean*	*Interpretation*
Stress management	(1) recognizing and understanding one's own stress triggers and responses.	3.9	ASD
	(2) having a repertoire of healthy coping mechanisms to deal with stress.	3.8	ASD
	(3) managing time efficiently to avoid feeling overwhelmed	3.6	ASD
	Sub Weighted Average	*3.7*	ASD
Self-management	(1) efficiently planning and organizing tasks to meet deadlines	3.4	OSD
	(2) demonstrating flexibility in the face of changing circumstances.	3.3	ASD
	(3) taking practical steps to achieve objectives without constant supervision.	3.4	ASD
	Sub Weighted Average	*3.4*	ASD
Self-esteem	(1) engaging in positive and affirming internal dialogue.	3.8	ASD
	(2) believing in own abilities and capacities.	3.8	ASD
	(3) feeling comfortable making decisions independently.	3.7	ASD
	Sub Weighted Average	*3.7*	ASD
Persistence	(1) identify current and future needs, setting goals, and defining success.	3.6	ASD

	(2) invest physical and mental energy to overcome challenges and achieve success.	3.4	ASD
	(3) open oneself to learning and show genuine interest.	3.7	ASD
	Sub Weighted Average	*3.6*	ASD
Initiative	(1) assess a situation and take action without direction from someone else.	3.7	ASD
	(2) skilled in initiating conflict resolution.	3.7	ASD
	(3) positive about decisions and to take action without hesitation.	3.7	ASD
	Sub Weighted Average	*3.7*	ASD
Honesty	(1) self-aware and honest with oneself.	3.9	ASD
	(2) able to communicate honestly and openly.	3.7	ASD
	(3) honest in all interactions.	3.8	ASD
	Sub Weighted Average	*3.8*	ASD
Flexibility	(1) ability to adapt to a new situations, changes and challenges with ease	3.8	ASD
	(2) manage unexpected circumstances	3.4	OSD
	(3) overcome limitations where possible	3.8	ASD
	Sub Weighted Average	*3.7*	ASD
Decision making	(1) ability to choose solutions to challenges.	3.6	ASD
	(2) able to factor different viewpoints in order to make a thoughtful decision.	3.4	OSD
	(3) think the advantages and disadvantages of every possible solution before making decision.	4.0	ASD
	Sub Weighted Average	*3.7*	ASD
Asking questions	(1) able to make observations and ask questions about certain situations.	3.8	ASD
	(2) ask specific questions as often	3.7	ASD
	(3) use the appropriate language and tone when asking question.	4.0	ASD
	Sub Weighted Average	*3.7*	
	General Weighted Average	**3.7**	

Legend (for Skills Demand): *(3.25-4.00) –Always Skill Demand (ASD); (2.50-3.24)-Often Skill Demand (OSD); (1.75-2.49) -Rarely Skill Demand (RSD); (1.00-1.74)-Not Skill Demand (NSD)*

The study found that honesty is a highly sought-after behavioral skill in both the ICT and food industries in the province. This includes open and honest communication, general honesty in interactions, and self-honesty. The industries likely believe that trusting honest employees is crucial for success in the local market (Klemchuk, 2023). Additionally, the study suggests that self-management skills, such as efficient task planning and organization, adaptability to changing situations, and taking initiative to achieve goals, are valuable across various industries (Wilson et al., 2021). While these skills were seen as important, they received a lower overall weighting compared to honesty. This indicates that graduates and employees may benefit from focusing on developing both honesty and self-management skills to meet industry demands.

4.9 Significant difference between the skills taught to grade 12 SHS Students' and the employer's demand skills for employment

The study compared the skills taught to Grade 12 students in ICT basics with the skills demanded by employers. The analysis showed no significant difference between the two (p-values of 0.000 and 0.003, both lower than the significance level of 0.05) (Table 9). This suggests that the non-technical skills like critical thinking, communication, and time management, as well as the basic ICT technical skills, are well aligned with industry expectations. However, a different result emerged for food industry technical skills in food preparation. The F-value from the analysis (6.698) was significant at the 0.05 level, indicating a substantial difference between the skills taught and those demanded by employers. This suggests there might be a gap between the curriculum and industry needs in this specific area. Finally, the analysis of behavioral skills showed no significant difference either (p-value of 0.087). This implies that the behavioral skills taught to Grade 12 students are generally on par with what employers look for in their workforce.

Table 9. Significant Difference Between the Skills Taught to Grade 12 SHS Students' and the Employer's Demand Skills for Employment

Parameters	*Non- Technical Skills*		*Industry Technical Skills: Computer Basic Skills*		*Industry Technical Skills: Food Prep.*		*Behavioral Skills*	
	F	*F-crit*	*F*	*F-crit*	*F*	*F-crit*	*F*	*F-crit*
Significant difference between the skills taught to Grade 12 SHS students and the employers' demand skills for employment	0.00	4.49	0.003	5.32	6.698*	5.32	0.087	4.49

* - Significant @ 0.05 level

4.10 Proposed Intervention Plan in Bridging the Mismatch Between Education and Industry Skill Demands

This study identified a gap between the skills taught in TVL tracks for ICT and food industry and the competencies demanded by employers. To bridge this gap, the researcher designed an intervention plan that focuses on enhancing non-technical skills like time management and communication, technical skills like computer programming and food preparation, and behavioral skills like persistence and stress management. This plan aims to align academic programs with current industry needs and ensure students graduate with job-ready skills. The researcher also recommends activities to improve students' workplace readiness and technical proficiency based on industry standards.

The researcher suggests schools with TVL tracks and home economics strands propose activities to improve various skills. By implementing the intervention plan and addressing the gaps between curriculum and industry needs, schools can better equip students for the job market. The study's results can be disseminated through various channels to stakeholders like teachers, school heads, and curriculum specialists. This wider dissemination can inform the development of a more comprehensive intervention plan to ensure TVL programs effectively prepare students for industry expectations.

5. CONCLUSIONS

Analysis and design in this study yielded the following conclusions:

- The non-technical skills and behavioral skills were always taught, while ICT technical skills and food technical skills were often taught.
- Non-technical skills and behavioral skills were always sought, while ICT technical skills and food technical skills were often sought.
- There was no significant difference between the skills taught and the skills sought under non-technical skills, technical ICT skills, and behavioral skills, while there was a significant difference under food industry technical skills.

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Arjay Balada
Professional Teacher
Philippines.
arjay.balada@deped.gov.ph
ORCID: 0009-0005-7106-4495

Nomelita Lo
Graduate School Faculty Member
Philippines