

PROJECT-BASED LEARNING IN CATERING: DEVELOPING SKILLS, CONFIDENCE, AND EMPLOYABILITY AMONG STUDENTS WITH SPECIAL EDUCATIONAL NEEDS (SENS)

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ABSTRACT

Project-based learning has gained recognition as an effective pedagogical approach that fosters practical skills and confidence among students. The Food Preparation and Production course offers the Malaysian Skills Certificate (SKM) Level 2 to Special Education Needs Students (SENS) with intellectual disabilities and learning difficulties. This action research study aimed to evaluate the effectiveness of project-based learning in catering activities in enhancing the skills and self-confidence of SENS. The study specifically addressed challenges associated with traditional buffet preparation, which was often less engaging and prone to food wastage. To mitigate these issues, the concept of a mini buffet was introduced, focusing on preparing small-sized dishes with diverse selections and creative plating techniques. Thirteen SENS participated in this study, divided into two sections: kitchen and restaurant. Data collection methods included observations, questionnaires, and students' self-assessments. The findings indicated notable improvements in students' technical skills, proficiency in handling kitchen equipment, time management, communication abilities, and self-confidence. Additionally, students gained a deeper understanding of the significance of preparing small-portioned dishes to minimize food waste. Regarding customer satisfaction, 95.2% of respondents agreed that the variety of small-sized dishes enhanced both visual appeal and presentation quality. Furthermore, the use of flowcharts and standardized recipes facilitated a more systematic comprehension of work processes, reducing students' reliance on teachers. In conclusion, integrating project-based learning through mini buffet activities effectively enhanced the skills, self-confidence, and employability of SENS in the catering industry while simultaneously improving teaching practices and enriching the Food Preparation and Production course.

Keywords: Project-Based Learning; Self-Confidence; Practical Skills; Employability

INTRODUCTION

The Catering Activity Program is an initiative designed to meet the requirements of the National Occupational Skills Standard (NOSS) under Competency Unit 09, namely Catering Set-up Activities. This program aims to provide practical exposure to students with Special Education Needs Students (SENs) in the catering industry, covering menu planning, operating kitchen equipment, preparing quality dishes, and communicating between colleagues and customers. This activity is also designed to increase students' self-confidence through experience working in a real environment. Catering services refer to the preparation of food and beverages by a chef in a restaurant or by a caterer who supplies food to businesses (Varma, Anamika. Hospitality and Catering Management Essentials. Educo Hack Press, 2025). Food is usually prepared in the main kitchen (central kitchen) and then sent to institutions such as hospitals, council halls, communities, schools, or private functions. This service is known as off-site catering. In this study, SENs provide food and beverages that have been set at a certain cost to a number of customers. The menu provided is small in size but attracts customers, and this service is known as on-site catering.

PROBLEM STATEMENT

The researcher's observations, when teaching catering activities, found that final year SENs will provide traditional and less challenging buffet dishes, where they only provide different dishes but the same concept. In addition, the weakness of the buffet task is waste. Students will decorate, cook and serve food at the buffet using a serving tray. This approach is less helpful in improving their planning, management and creativity skills. The following are the themes and posters of catering activities that have been carried out by the final year SENs from 2021 - 2024.

Table 1: Themes and posters of catering activities in 2021-2024

Year	Theme	Poster
2021	Malay Heritage	
2022	International Buffet	
2023	Lunch Buffet	
2024 – Batch 1	Malay Wedding	

Source : Food Preparation and Production Committee File Report, 2024

LITERATURE REVIEW

Project-Based Learning (PBL) is a student-centered approach where learners gain knowledge and skills by engaging in extended, real-world tasks. Recent studies have examined its applicability for students with disabilities. Wertz and Mulcahy (2024) investigated the alignment of PBL elements with high-leverage practices in special education, suggesting that PBL has strong potential for effectiveness with students with disabilities, although more systematic research across various groups is still needed. Bell (2010) also described PBL as an approach that enhances student engagement, problem-solving, and collaboration. Thomas (2000) supported this, noting that real-world tasks help learners develop critical thinking skills. Vocational education, especially in food preparation and production, provides SEN students with employable skills and promotes independence (Smith & Jones, 2020). According to Varma (2025), catering education exposes students to industry-relevant practices such as using commercial kitchen equipment, adhering to hygiene protocols, and serving customers—skills that support both technical and interpersonal development. Patel (2022) emphasized the importance of hands-on training in fostering responsibility among students with learning disabilities. The current study aligns with these principles by involving students in mini buffet projects that simulate real-world culinary experiences. Inclusive teaching strategies that consider the unique needs of students have been shown to significantly improve classroom participation and learning outcomes. This research adopts similar strategies, offering repeated practice, group collaboration, and teacher-guided reflection. Building self-confidence is also critical for the employability of SEN students. Innovative internship programs have been developed to support young people with learning disabilities by equipping them with the necessary skills and confidence to secure paid employment, thereby improving their quality of life and independence. In catering education, step-by-step guides have been shown to improve comprehension and reduce reliance on verbal instruction. This approach has been successfully implemented in several studies, as SEN students were able to use visual tools for guidance and self-correction. Standardized recipes provide structure, reduce anxiety, and foster independence. Visual learning tools also align with the principles of Universal Design for Learning (UDL), which advocates for multiple means of representation to support diverse learners.

RESEARCH OBJECTIVES

1. Able to improve SENs' skills and self-confidence in catering activities through the implementation of challenging tasks and realistic practical experiences.
2. Be able to analyze the impact of preparing small-sized dishes and a variety of choices on customer satisfaction and the effectiveness of SENs learning.
3. Students can follow a lifelong learning platform by improving their skills and marketability in the catering industry.

RESEARCH QUESTIONS

1. How do challenging tasks and realistic practical experiences in catering activities improve the skills and self-confidence of students with Special Educational Needs (SENs)?
2. What is the impact of preparing small-sized dishes with a variety of choices on customer satisfaction and the learning effectiveness of students with Special Educational Needs (SENs)?
3. How does participation in catering activities enhance the lifelong learning potential and marketability of students with Special Educational Needs (SENs) in the catering industry?

METHODOLOGY

This study employed an action research approach based on the model proposed by Kemmis and McTaggart (1988), which involves four cyclical stages: planning, acting, observing, and reflecting. The purpose of the research was to evaluate the effectiveness of project-based learning, particularly through mini buffet activities, in enhancing the skills, confidence, and employability of students with Special Educational Needs (SENs).

The planning phase began with identifying common issues in traditional catering lessons—particularly the lack of variety, repetitive menus, and minimal student engagement. To address this, the researcher designed a mini buffet project under the theme “Mini Buffet: The Colorful Colors of Malaysia.” This concept encouraged the preparation of small-sized dishes, allowing students to explore diverse local cuisine and focus on food presentation, portion control, and efficient kitchen practices. The learning experience was structured to replicate real-world catering operations in a safe and manageable environment. A total of 13 SEN students participated in the study, comprising eight male and five female students. These students were divided into two main groups based on their roles: seven students were placed in the kitchen section, while the remaining six were involved in the restaurant service section. The project spanned several weeks and was integrated into the existing vocational curriculum, with specific stages of planning, preparation, execution, and evaluation. During the acting phase, students engaged in hands-on catering tasks including menu planning, food preparation, kitchen equipment usage, customer service, and restaurant decoration. They also participated in group discussions, practical workshops, and reflection sessions.

Data collection was carried out through direct observations, student self-assessment forms, and feedback from customers who attended the mini buffet. Observations were conducted by the researcher along with two experienced special education teachers who served as co-observers. These educators have backgrounds in vocational training and were responsible for assessing students' technical and communication skills, teamwork, and time management. The scoring criteria were aligned with the Malaysian Skills Certificate (SKM) Level 2 standards and focused on safe kitchen practices, food quality, creativity in presentation, punctuality, and interaction with customers.

Student reflections and self-assessments were completed after each stage of the catering activity, allowing students to evaluate their own performance and express their learning experiences. In addition, feedback was gathered from 42 adult customers who attended the mini buffet and voluntarily completed a satisfaction survey. This helped evaluate the presentation, taste, and variety of the small-sized dishes prepared by the students.

The reflection phase involved analyzing all collected data to assess improvements in student performance and identify areas for further enhancement. Overall, the methodology provided a structured yet flexible environment for experiential learning, allowing SEN students to gain relevant skills while building confidence and preparing for future employment opportunities.

RESULTS FINDINGS

1. Able to improve SENs' skills and self-confidence in catering activities through the implementation of challenging tasks and realistic practical experiences.

Figure 1: Self-assessment score

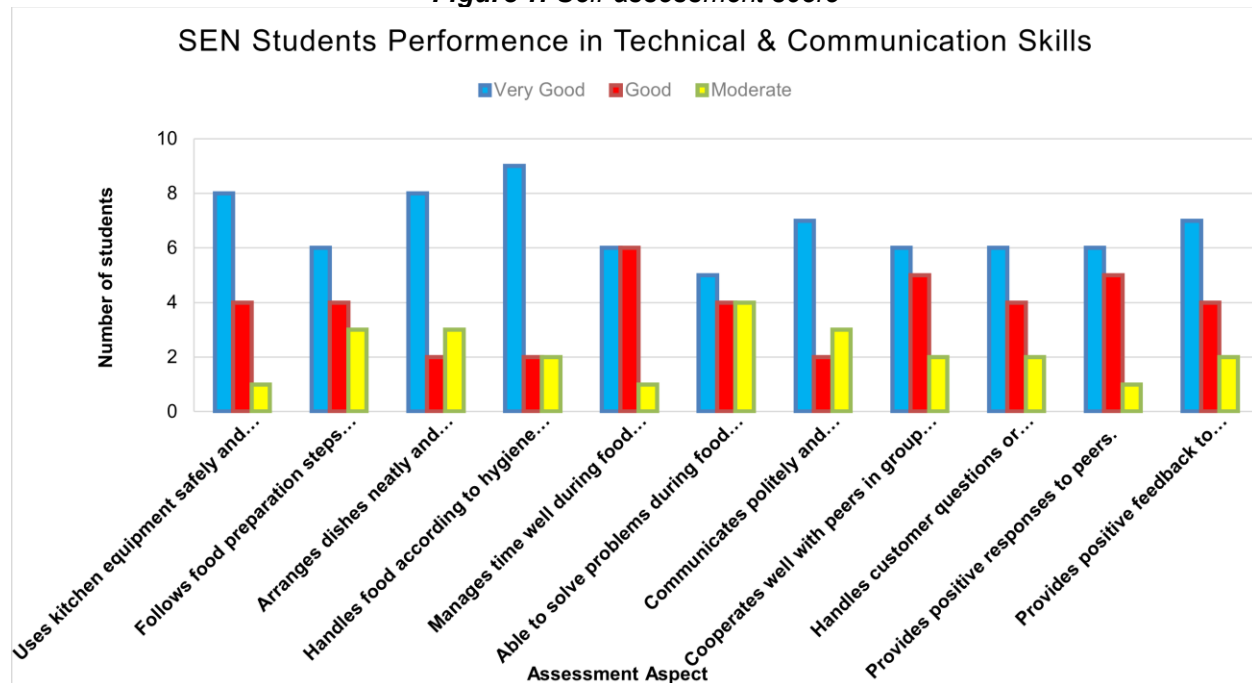


Figure 1 is a the analysis of observation-based assessments indicates that project-based learning through the mini buffet activity effectively enhanced the technical and communication skills of students with Special Educational Needs (SENs). The findings, drawn from both structured observations and self-assessment scores, support the conclusion that realistic and challenging catering tasks significantly improved the participants' skills and self-confidence. Thirteen SEN students took part in the activity and were divided into two groups: the kitchen section and the restaurant section. Among the seven students in the kitchen, six demonstrated strong individual performance with minimal monitoring. One student, although requiring isolation to remain focused, still managed to complete the assigned tasks successfully. In the restaurant section, four students were able to perform their responsibilities with minimal guidance and showed creativity in decorating the space. The remaining two students required clearer instructions but, once provided, performed well.

The students' self-assessment results further reinforced these observations. Most students rated themselves in the "Very Good" or "Good" categories across all key technical skills. High scores were recorded in the safe and correct use of kitchen equipment, following food preparation

steps, arranging dishes attractively, and maintaining hygiene standards. Specifically, eight students rated themselves as “Very Good” in using equipment and arranging dishes, while nine achieved the highest score in food hygiene practices. Time management and problem-solving also received favorable scores, reflecting students’ increased independence and deeper understanding of kitchen operations.

Communication and collaboration skills showed noticeable improvement as well. Many students felt more confident in interacting with customers and displayed effective teamwork in group tasks such as preparing meals, managing buffets, and handling customer service roles. Several were able to respond well to customer inquiries and interact positively with peers. Although a few students required continued support in providing feedback to customers, the majority demonstrated cooperative behavior and appropriate communication in a service setting. One student, despite experiencing emotional fatigue, still completed their responsibilities, and others showed initiative by seeking out additional tasks without direction. Only a small number required occasional reminders to stay focused.

Overall, the mini buffet project served as a valuable platform for SEN students to engage in hands-on, work-based learning. The use of visual aids such as flowcharts and standardized recipes encouraged a structured approach to task execution and helped reduce dependence on teacher instructions. This project-based learning method not only enhanced the students’ technical and communication competencies but also fostered their self-confidence and ability to work independently.

2. Be able to analyze the impact of preparing small-sized dishes and a variety of choices on customer satisfaction and the effectiveness of SENs learning.

a) Customer satisfaction

There were 62 customers present for the mini buffet, consisting of 60 adult customers and two child customers. However, only 42 customers provided feedback on their satisfaction with the mini buffet. Automatically, two child customers were not counted as a study finding. The response analysis in Figure 3 below shows that 95.2% of respondents (40 customers) agreed that small-sized dishes and a variety of choices increase the attractiveness of the food presentation. In comparison, 4.8% (2 customers) thought otherwise. In terms of variety of choices, 97.6% of respondents (41 customers) stated that the variety of dishes increased their satisfaction, while 2.4% (customers) disagreed less. Regarding the size of the dishes, 92.8% of respondents (39 customers) were satisfied because the small size made it easier for them to try various types of food, but 7.2% (3 customers) disagreed. Meanwhile, in terms of taste and quality, 90.5% of respondents (38 customers) were of the opinion that the small size did not affect the taste and quality of the food. In comparison, only 9.5% (4 customers) disagreed. Stated that the concept of small-sized dishes and various choices met their expectations and increased satisfaction with this mini buffet. Only 4.8% (2 customers) disagreed. Overall, these findings prove that the provision of small-sized dishes and various choices has successfully attracted attention and provided high satisfaction to the customers present, consisting of the community, parents, teachers, and students.

Figure 2: Customer satisfaction regarding mini buffet



b) Effectiveness of SENs learning

Overall, the findings of learning effectiveness, 100% of SENs agreed that this catering activity was fun and helped their learning. A total of 92% of SENs were able to manage their time well. Although 92% admitted that they were tired, they still managed to complete the task. In addition, 100% were able to increase their confidence in preparing food and dealing with customers.

Table 2: SENs in the kitchen section

Percentage	Description
100 %	7 SENs understood the preparation of mini dishes and cooking skills.
86 %	6 SENs managed their time well, despite feeling tired.
100 %	7 SENs felt confident after completing the task, although there were minor mistakes such as excessive use of oil.

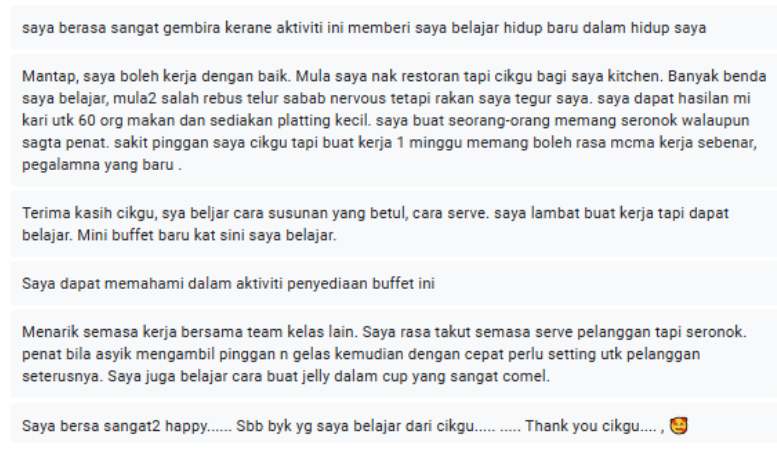
Table 3: SENs in the restaurant division

Percentage	Description
100 %	6 SENs understood the concept of mini dishes and arranged the buffet creatively.
83 %	5 SENs managed their time well, despite the fear of interacting with customers.
100 %	6 SENs gained confidence after serving the customers.
67%	4 SENs were proactive in seeking additional tasks, while 33% (2 SENs) required guidance to stay focused.

The mini buffet-based catering activity has had a positive impact on the effectiveness of SENs' learning, especially in terms of technical skills, time management, creative meal preparation, communication, and self-confidence. Students better understand the importance of preparing small-sized meals and a variety of choices despite challenges such as fatigue and lack

of focus for a few SENs. In terms of analysis of student comments entered by SENs when answering questions on the Google Form:

Figure 3: SENs' comments on catering activities



Based on the comments given by SENs, there were several positive things, namely that SENs enjoyed working together, were satisfied even though they were tired, were more confident in dealing with customers, learned how to arrange food, and hoped that activities like this would continue. Meanwhile, in terms of the challenges faced by SENs throughout the catering activities, they felt tired, were afraid of dealing with many customers, and needed more training to increase speed and confidence.

Overall, the mini buffet is a suitable approach for SENs in improving practical skills, communication, self-confidence, and presentation creativity. Despite the challenges in terms of fatigue and pressure of the real work environment, students are able to adapt and show improved performance through continuous guidance and practical training.

3. Students can follow a lifelong learning platform by improving their skills and marketability in the catering industry.

Findings from observations and student feedback show that the use of flowcharts makes it easier for SENs to follow the steps of preparing meals in an organized manner, thus reducing errors because they can be referred to repeatedly. This visual approach is easier to understand than written instructions, helping students understand the order of work from preparing ingredients to serving. It fosters systematic work discipline, reduces dependence on teachers, increases understanding, and builds skills for the long term, thus increasing their marketability in the catering industry.

The following are examples of materials and water maps used during catering activities.

Figure 4: Pamphlet and sample recipe

The pamphlet on the left is for a 'Mini Buffet: Warna Warni Malaysia' event on 17 Nov 2024 at Bilik Aura V' Rasa, SMPK Vokasional Indahpura. It lists prices for adults (RM 25) and children (RM 15) and provides session times. The recipe table on the right is for 'Mee Kari' and includes a list of ingredients and quantities for 20 and 80 pax.

KEMAHIRAN / TAHAP		PENYEDIAAN DAN PEMBUATAN MAKANAN / TAHAP 2 (HT-012-2)	
UNIT KOMPETENSI	CU 9	CATERING SET UP ACTIVITIES	
TAJUK	MAIN COURSE	MI KARI	
COMMIS	ISKANDAR HAIREL (PES KARI)		
STANDAR RESIPI			
BIL	BAHAN	1 PAX = 20 cup	4 PAX = 80 cup
1	Mi Kuning	1 kg	4 kg
Kuah Kari			
1	Bawang merah	54 g	216 g
2	Bawang putih	20 g	80 g

Figure 5: List of dish recipes and example flowchart

The collage shows four recipes with visual aids and text instructions:

- SATEY:** Images of skewers with meat and vegetables.
- DIM SUM:** Images of dumplings and a steaming pot. Text: 'Panaskan air sebelum kukus dim sum. Kukus dim sum 5-10 minit. Keluarkan dimsum dari periuk pengukus. Taburkan popia goreng di pinggan hidang, kemudian susun dim sum ikut kreativiti.'
- POTONGAN BUAH:** Image of a fruit platter.
- VIETNAM ROLL:** Images showing the steps of rolling a spring roll. Text: 'Plating menggunakan sudu putih dan tabur kacang kisar.'

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

Discussions

Based on the review of the problems every year, SENs provide catering activities with the same concept, less provision of catering activities that are different from others, and less exposure to real practical training in the industry. Therefore, the researcher feels that there is a need to improve on the issues raised in this study, the researcher has proposed to use a mini buffet task, where SENs will provide many dishes in small portions and will make plating for each dish. In addition, SENs will provide dishes little by little instead of providing dishes all at once.

Figure 6: Students Demonstrate Preparation of Vietnam Roll



The use of flow charts and standard recipes as references in catering activities has been proven to have a positive impact on the development of SEN students' skills. Through this approach, students are educated to cultivate more systematic work discipline because they need to follow the work steps according to the correct work schedule. In addition, students' dependence on teachers is decreasing because they can refer to the flow charts independently, thus increasing their level of understanding and ability to make their own decisions. Students are also exposed to actual operating standards commonly practiced in the catering industry, making them better prepared to face the challenges of the world of work.

Indirectly, the use of flowcharts helps to improve students' efficiency in managing catering tasks, in addition to improving their marketability upon graduation. This approach not only empowers students in terms of technical skills but also builds confidence and independence, which are important added values to compete in the food and service industry. The visual approach is effective for SENs because it is easier to understand than written instructions. Through the use of this guide, SENs show an increased level of understanding and more confidence in carrying out catering activities. In addition, referring to the flowcharts that are used repeatedly helps students remember the work steps better, thus building skills that continue for the long term and reducing errors during the food production process.

Conclusion

Overall, this action research has proven that the project-based learning approach in the context of the catering industry is not only effective in improving the vocational skills of SENs but also shapes the personality of students to be more confident, disciplined, and ready to face the challenges of the world of work. Teachers can also strengthen teaching methods while the Food Preparation and Production course continues to be enriched with practical elements that are relevant to the needs of the current industry, preparing meals little by little instead of preparing meals all at once.

Impact on Students (SENs)

The implementation of the mini buffet has improved the technical skills, self-confidence, and social skills of SENs. Students are more efficient in using kitchen equipment, understand the preparation of small-sized dishes, and are punctual. They also show better cooperation and are brave in communicating with customers. Despite facing challenges such as fatigue, they have managed to adapt and become more disciplined and independent.

Impact on Teacher Teaching

This study helps teachers implement more effective practical approaches, identifying students'

strengths and planning more specific guidance. The use of flowcharts as a working guide increases teaching effectiveness, reduces students' dependence on teacher instructions and fosters a reflective culture among educators.

Impact on the Food Preparation and Production Committee

This study enriches the course content with real industry elements, emphasizing aesthetics, waste reduction, and a variety of meal options. SENs are given the opportunity to explore creativity in food presentation and understand the standards of the catering industry, making them better prepared for the world of work. This approach strengthens the vocational training for SENs in the field of Food Preparation and Production.

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