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Research Article

A Descriptive Study on the Effectiveness of the Scan-and-Learn Mobile Application in Enhancing Knowledge, Skills, and Engagement in Technical and Vocational Education

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ABSTRACT

This study examines the effectiveness of the Scan-and-Learn Mobile App in enhancing Grade 7 students' learning outcomes in Technical and Vocational Education (TVE), focusing on their knowledge and skills related to kitchen tools and equipment. The research addresses the challenge of limited access to physical resources in schools by exploring how mobile learning technology can support teaching and learning in resource-constrained environments. Using descriptive research methods, data were collected from 71 student respondents through surveys that included both closed-ended and open-ended questions. The responses were analyzed using weighted means to evaluate the app's impact across five components: knowledge, skills, engagement and motivation, perceived usefulness, and satisfaction. The findings reveal that the app significantly improves students' knowledge and understanding of kitchen tools, as well as their practical skills in operating kitchen equipment. Students report high levels of engagement and motivation, emphasizing the app's interactive features, such as step-by-step instructional videos and scanning tools, as key factors in making learning enjoyable and effective. The app is also perceived as a highly useful supplementary tool for reinforcing classroom learning, providing quick access to information, and fostering independent study. However, the study notes that while the app enhances understanding and skill development, hands-on practice is essential to further improve students' ability to apply their skills accurately in real-world scenarios. The study concludes that the Scan-and-Learn Mobile App is a valuable educational resource, particularly for public schools with limited access to physical resources, as it provides an innovative and cost-effective solution for improving TVE learning outcomes. Future research is recommended to investigate the long-term retention of knowledge gained through the app and to explore its application in other areas of TVE.

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Introduction

The use of information and communication technologies (ICTs) has become increasingly important in education as schools respond to the learning needs of students who are growing up in a digital environment. In the 21st century, learners are more accustomed to using mobile devices, which has encouraged educators to explore new teaching approaches that go beyond traditional classroom instruction. One such approach is mobile learning, which allows students to access learning materials anytime and anywhere, making learning more flexible and learner centered.

In the Philippine context, recent studies have shown that mobile learning applications can positively influence students' academic performance and interest in learning. For instance, research conducted among secondary school students in General Trias City revealed that mobile learning apps significantly improved students' understanding and interest, especially when the apps provided clear features and easily accessible content (Pedraza and Canoy, 2025). Similarly, Luctkar-Flude (2024) found that mobile classroom response systems encouraged active participation and helped students stay focused during lessons. These findings suggest that mobile technologies can enhance both learning outcomes and student motivation.

The effectiveness of mobile learning tools, however, depends on factors such as usability, perceived usefulness, and learner satisfaction. A study on digitalized cookery learning modules reported that students and practitioners found the materials practical and effective, highlighting the importance of tools that are easy to use and relevant to learning tasks (Palomeras, 2024). In addition, mobile learning formats that provide quick access to information, such as QR code-based materials, have also shown positive results. For example, Serrano (2023) found that the use of QR codes in science lessons improved students' understanding of thermodynamics concepts. This indicates that QR-based mobile technologies may also be effective in skill-based subjects such as Technical Vocational Education (TVE).

TVE is a core subject in the Philippine junior high school curriculum and focuses on developing practical skills that are useful in daily life and future livelihood opportunities. Under DepEd Memorandum No. 353, s. 2008, designated technical-vocational high schools were tasked with implementing the Strengthened Technical-Vocational Education Program - Competency-Based Curriculum (STVEP-CBC), reinforcing the importance of equipping students with industry-relevant competencies through structured, hands-on learning. In cookery, students are expected to learn about kitchen tools and equipment, including their identification, proper use, and maintenance. However, many public schools face challenges such as limited equipment and inadequate laboratory facilities, which reduce students' opportunities for hands-on learning (Barcelona et al., 2023). These physical constraints directly contribute to specific learning gaps among Grade 7 cookery students — particularly in the accurate identification of kitchen tools, understanding their designated functions, and developing confidence in operating kitchen equipment safely. When students cannot regularly interact with actual tools and equipment due to insufficient laboratory resources, they have fewer opportunities to build the practical knowledge and hands-on competence that the TVE cookery curriculum requires (Cabutihan et al., 2024). To address these limitations, teachers have increasingly adopted technology-enhanced instruction. Studies have shown that the use of learning management systems, video-based lessons, and contextualized video-assisted instruction in TVE cookery can improve student engagement and performance (Quimco et al., 2025; Enguito and Calipayan, 2025; Ducena L. and Ducena E., 2025). These findings demonstrate that multimedia, immersive and technology-integrated approaches can make learning more concrete and engaging for students (Borromeo et al., 2025; Eduria et al., 2025).

Despite these advancements, most technology-based interventions in TVE have focused on videos or web-based materials, with limited emphasis on mobile applications that use QR codes for immediate and contextual learning. The Scan-and-Learn Mobile App addresses this gap by allowing students to scan QR codes attached to actual kitchen tools and equipment to instantly access digital content such as tutorials, step-by-step demonstrations, and usage guides. This design is particularly responsive to the learning gaps created by limited laboratory access, as it provides students with a portable, on-demand alternative to physical demonstration — enabling them to visualize tool identification, proper usage, and safety procedures even outside a fully equipped laboratory setting. This approach helps connect theoretical knowledge with practical application. Supporting this, Bawal and Cuenca (2023) found that students who used interactive mobile apps performed significantly better in both written tests and practical skills than those taught using traditional methods.

Moreover, the growing integration of advanced digital tools in education highlights the importance of aligning instructional strategies with students' digital preferences. Fabro et al. (2024) emphasized that the use of modern digital technologies can enhance student engagement and academic performance, provided that learners are guided in using these tools effectively. This further supports the potential of mobile applications like the Scan-and-Learn Mobile App to improve learning experiences in practical subjects such as TVE cookery.

In this context, the present study reports on the effectiveness of the Scan-and-Learn Mobile App in teaching Grade 7 students about kitchen tools and equipment, with the aim of determining its impact on students' knowledge, skills, engagement, motivation, perceived usefulness, and overall satisfaction.

Materials and Methods

This study employed a descriptive quantitative design to evaluate the effectiveness of the Scan-and-Learn Mobile App in enhancing Grade 7 students' knowledge, skills, engagement, motivation, perceived usefulness, and satisfaction in Technical Vocational Education (TVE). Conducted at a premier technical-vocational secondary school in Northern Philippines, the study involved 71 Grade 7 Cookery students during the academic year 2025–2026. Total enumeration was employed as the sampling method, meaning all available Grade 7 Cookery students enrolled during the study period were included in the study. To be included, participants had to meet the following criteria: (1) officially enrolled as Grade 7 students in the TVE Cookery strand for the academic year 2025–2026; (2) present during the scheduled data collection period; and (3) willing to participate voluntarily in the study. Students who were absent during data collection or who declined to participate were excluded from the study. Data were collected via a researcher-designed Likert-scale questionnaire covering demographics, knowledge, skills, engagement, motivation, perceived usefulness, and satisfaction. The instrument underwent expert content validation and peer validation by qualified educators and subject matter specialists to ensure content accuracy, clarity, and relevance prior to its administration. During data collection, researchers demonstrated app features before participants completed the survey voluntarily. Data were analyzed using descriptive statistics, including frequency counts, percentages, and mean scores, interpreted through a 5-point scale. Ethical standards were strictly observed, with informed consent, voluntary participation, confidentiality, and secure data handling maintained throughout the study.

Result and Discussion

Based on the Statement of the Problem, this section presents and discusses the findings of the study on the effectiveness of the Scan-and-Learn Mobile Application in enhancing Grade 7 students' learning outcomes in Technology and Livelihood Education (TLE), specifically in the area of kitchen tools and equipment. The results are organized into five components: students' knowledge, skills, engagement and motivation, perceived usefulness, and level of satisfaction. Descriptive statistics, particularly weighted mean and standard deviation, were used to interpret the data gathered from 71 respondents.

A. Knowledge of Kitchen Tools and Equipment

Table 1 presents the findings on students' level of knowledge regarding kitchen tools and equipment after using the Scan-and-Learn Mobile App. The overall weighted mean of **4.75**, interpreted as **Extremely Knowledgeable**, indicates that the students demonstrated a very high level of understanding and familiarity with kitchen tools and their functions.

Table 1. Level of Students' Knowledge of Kitchen Tools and Equipment When Using the Scan-and-Learn Mobile App

Statement	Mean	Descriptive Interpretation
The Scan-and-Learn Mobile App helped me recognized different kitchen tools accurately.	4.97	Extremely Knowledgeable
The app helps me easily match kitchen tools with their correct names.	4.78	Extremely Knowledgeable
The app improved my understanding of the specific uses of each kitchen tool.	4.78	Extremely Knowledgeable
The definition provided in the app increased my knowledge of kitchen tools.	4.60	Extremely Knowledgeable
The app lets me differentiate similar looking tools with different functions.	4.67	Extremely Knowledgeable
The app enhanced my recall of kitchen tools and equipment during class activities.	4.59	Extremely Knowledgeable
The app improved my knowledge in identifying common kitchen tools.	4.66	Extremely Knowledgeable
The explanations in the app helped me remember the proper terms of kitchen equipment.	4.74	Extremely Knowledgeable
The app helped me identify which tools are used in food preparation and cooking.	4.77	Extremely Knowledgeable
The app improved my knowledge of classifying kitchen tools according to their purpose.	4.81	Extremely Knowledgeable
Overall Mean	**4.75**	**Extremely Knowledgeable**

***Note**: 4.50-5.00 Extremely Knowledgeable, 3.50-4.49 Very Knowledgeable, 2.50-3.49 Moderately Knowledgeable, 1.50-2.49 Slightly Knowledgeable, 1.00-1.49 Not at all Knowledgeable*

The data reveals that the majority of the scores are near-perfect, with the highest mean score reaching 4.97 out of 5.00 and the lowest score being 4.59. These consistently high scores indicate that students found the app to be highly effective in enhancing their knowledge and skills related to kitchen tools. However, the clustering of scores at the upper end of the scale suggests the presence of a ceiling effect, where the evaluation tool may not fully capture variations in students' experiences or the app's impact on learning outcomes.

These high scores suggests that the Scan-and-Learn Mobile App was exceptionally effective in achieving its intended goals. The app's interactive and user-friendly design likely contributed to its success, as students may have found it easy to navigate and engaging to use. For instance, the app's ability to provide instant feedback and detailed information about kitchen tools may have simplified the learning process, allowing students to achieve high levels of accuracy and confidence in their knowledge. Additionally, the high scores could also reflect the students' prior familiarity with the material. If students already had a foundational understanding of kitchen tools, the app may have served as a reinforcement tool, helping them refine their knowledge rather than introducing entirely new concepts. This would explain why the scores were consistently high across all evaluated aspects.

The implications of these findings are two-fold. On one hand, the near-perfect scores demonstrate the app's potential as a powerful educational tool for enhancing students' learning experiences in Technology and Livelihood Education (TLE). The app's ability to achieve such high ratings suggests that it could be an effective supplement to traditional teaching methods, particularly in resource-limited classrooms where access to physical tools may be restricted. On the other hand, the ceiling effect limits the ability to distinguish between students who significantly benefited from the app and those who were already knowledgeable about kitchen tools. This highlights the need for future studies to include pre-tests and post-tests to more accurately measure learning gains and to ensure that the evaluation tool can better differentiate between varying levels of knowledge acquisition.

The findings align with existing literature on the effectiveness of mobile learning tools in education. Pedraza and Canoy (2025) found that mobile apps with intuitive designs and interactive features often lead to high levels of student engagement and satisfaction, which can result in consistently high evaluation scores. Similarly, Garzón et al. (2025) emphasized that mobile learning tools are particularly effective when used to reinforce prior knowledge, as they enable students to review and consolidate their understanding in an accessible and convenient manner. Furthermore, a study by Chakraborty (2023) highlighted that mobile apps that simplify complex concepts and provide immediate feedback are more likely to receive positive evaluations from students, further supporting the high scores observed in this study.

B. Skills in Operating Kitchen Equipment

Table 2 presents the level of students' skills in operating kitchen equipment when using the Scan-and-Learn Mobile App. The data reveals an overall mean score of **4.67**, which is interpreted as "**Very Highly Skilled**," indicating that the app was highly effective in improving students' ability to operate kitchen equipment.

Table 2. Level of Students' Skills in Operating Kitchen Equipment When Using the Scan-and-Learn Mobile App

Statement	Mean	Descriptive Interpretation
The step-by-step videos in the app improved my ability to operate kitchen equipment correctly.	4.97	Very High Skilled
The demonstrations helped me understand the proper sequence of using equipment.	4.70	Very High Skilled
The app improved my skills in handling the kitchen.	4.60	Very High Skilled
The app helped me follow safety procedures while operating equipment.	4.70	Very High Skilled
The app improved my speed and accuracy in performing tasks with equipment.	4.47	High Skilled
The app made it easier to practice equipment handling independently.	4.64	Very High Skilled
The app enhanced my skills in turning equipment on and off correctly.	4.56	Very High Skilled
The app improved my skill of maintenance and care for kitchen equipment.	4.66	Very High Skilled
The app increased my skill in careful equipment handling.	4.66	Very High Skilled
The app gave me practical skills that I could apply in real kitchen tasks.	4. 78	Very High Skilled
Overall Mean	**4.67**	**Very High Skilled**

***Note**: 4.50-5.00 Very Highly Skilled, 3.50-4.49 Highly Skilled, 2.50-3.49 Moderately Skilled, 1.50-2.49 Slightly Skilled, 1.00-1.49 Not Skilled*

Among the ten evaluative statements, the highest-rated statement was *"The step-by-step videos in the app improved my ability to operate kitchen equipment correctly,"* with a mean score of 4.97, interpreted as "Very Highly Skilled." This suggests that students found the app's instructional videos particularly helpful in guiding them through the correct operation of kitchen equipment. A student shared, *"The videos were so clear and easy to follow that I felt confident operating the equipment even on my first try."* This quote highlights how the app's visual demonstrations provided a structured and accessible learning experience, enabling students to develop their skills efficiently. On the other hand, the lowest-rated statement, *"The app improved my speed and accuracy in performing tasks with equipment,"* received a mean score of 4.47, which is interpreted as "Highly Skilled." While still a positive score, it suggests that the app had a slightly lower impact on improving the speed and precision of task execution. One student noted, *"The app helped me understand how to operate the equipment, but I think I need more practice to do tasks faster and more accurately."* This feedback underscores the importance of hands-on practice in complementing virtual learning tools for skill refinement.

These results suggests that the Scan-and-Learn Mobile App effectively enhanced students' practical skills in operating kitchen equipment. The consistently high scores across all statements reflect the app's ability to address various dimensions of skill acquisition, including proper operation, safety, maintenance, and independent practice. The highest-rated statement highlights the importance of step-by-step instructional videos, which likely provided students with a clear and structured approach to using kitchen equipment correctly. On the other hand, the relatively lower score for speed and accuracy may indicate that while the app improved students' understanding and handling of equipment, the development of speed and precision might require additional hands-on practice or real-life application beyond the app.

These findings are significant for TVE. The app's ability to improve students' operational skills suggests that mobile learning tools can serve as effective supplements to traditional teaching methods, particularly in environments where access to physical kitchen equipment is limited. The app's interactive features, such as instructional videos and demonstrations, provide students with an opportunity to practice and refine their skills independently, which is crucial for developing confidence and competence in operating kitchen equipment. A student remarked, *"I liked how the app let me practice on my own without needing someone to constantly supervise me—it made learning feel less intimidating."* This statement supports the app's role in fostering independent learning and skill development. However, the slightly lower score for speed and accuracy highlights the need for educators to integrate the app with hands-on training to ensure that students can transfer their skills from a virtual environment to real-world tasks.

The findings from this study are consistent with existing research on the effectiveness of mobile learning in skill development. For example, Pedraza and Canoy (2025) found that instructional videos in mobile apps significantly enhance students' ability to perform practical tasks by providing clear, step-by-step guidance. Similarly, Garzón et al. (2025) emphasized the importance of interactive learning tools in improving students' technical skills, particularly in vocational education settings. Furthermore, Chakraborty (2023) noted that mobile apps that combine visual demonstrations with opportunities for practice are more likely to result in skill retention and application, which aligns with the high scores observed in this study for statements related to independent practice (mean = 4.64) and skill application in real kitchen tasks (mean = 4.78).

C. Student Engagement and Motivation when Using the Scan-and-Learn Mobile App

Table 3 presents the findings on students' engagement and motivation levels while using the Scan-and-Learn Mobile App. The overall weighted mean of **4.54**, interpreted as **Very Highly Engaged and Motivated**, indicates that the app strongly stimulated students' interest and active participation in learning.

Table 3. Level of Student Engagement and Motivation When Using the Scan-and-Learn Mobile App

Statement	Mean	Descriptive Interpretation
The app made learning kitchen tools and equipment more enjoyable.	4.58	Very Highly Engaged and Motivated
I felt more motivated to study when using the Scan-and-Learn Mobile App.	4.52	Very Highly Engaged and Motivated
The interactive scanning feature kept me interested during lessons.	4.54	Very Highly Engaged and Motivated
The app encouraged me to participate more actively in class discussions.	4.54	Very Highly Engaged and Motivated
I spent more time reviewing kitchen tools and equipment because of the app.	4.52	Very Highly Engaged and Motivated
The app made me curious to learn beyond what was taught in class.	4.59	Very Highly Engaged and Motivated
I felt excited whenever I used the app in learning activities.	4.45	Highly Engaged and Motivated
The app reduced boredom during lessons on kitchen tools and equipment.	4.45	Highly Engaged and Motivated
I looked forward to using the app in future lessons.	4.59	Very Highly Engaged and Motivated
The app encouraged me to study independently at home.	4. 63	Very Highly Engaged and Motivated
Overall Mean	**4.54**	Very Highly Engaged and Motivated

***Note**: 4.50-5.00 Very Engaged and Motivated, 3.50-4.49 Highly Engaged and Motivated, 2.50-3.49 Moderately Engaged and Motivated, 1.50-2.49 Slightly Engaged and Motivated, 1.00-1.49 Not Engaged and Motivated*

Among the ten evaluative statements, the highest-rated items are *"The app made me curious to learn beyond what was taught in class"* and *"I looked forward to using the app in future lessons,"* both with a mean score of 4.59, indicating that the app successfully sparked curiosity and enthusiasm for learning. A student shared, *"The app made me want to explore more about kitchen tools and equipment, even outside of class—it felt like learning was fun."* On the other hand, the lowest-rated statements, *"I felt excited whenever I used the app in learning activities"* and *"The app reduced boredom during lessons on kitchen tools and equipment,"* both received a mean score of 4.45, which is interpreted as "Highly Engaged and Motivated." While these scores are still positive, they suggest that the app's ability to sustain excitement and reduce boredom during lessons may not have been as impactful as its ability to foster curiosity and independent learning.

These results suggests that the Scan-and-Learn Mobile App effectively engaged and motivated students in learning about kitchen tools and equipment. The consistently high scores across all statements reflect the app's ability to make learning more interactive and enjoyable. The highest-rated statements highlight the app's success in creating a sense of curiosity and anticipation among students, as well as encouraging them to continue learning beyond the classroom. However, the relatively lower scores for excitement and boredom reduction suggest that while the app was engaging, there may still be room for improvement in making the learning experience more dynamic and stimulating.

These findings are particularly relevant in the context of TVE. The app's ability to enhance student engagement and motivation suggests that mobile learning tools can address common challenges in TVE, such as lack of student

interest and limited access to physical resources. By providing interactive features like scanning and demonstrations, the app created a more immersive learning environment that encouraged students to actively participate in their education. One student remarked, *"I really liked the scanning feature—it made me feel like I was part of the lesson, and I wanted to keep learning more."* This statement highlights how innovative features can sustain student interest and make lessons more engaging. However, the slightly lower scores for excitement and boredom reduction suggest that educators could further enhance the app by incorporating gamified elements or more dynamic activities to make the learning experience even more captivating.

The findings from this study align with existing research on the effectiveness of mobile learning tools in improving student engagement and motivation. For instance, Pedraza and Canoy (2025) found that interactive features in mobile apps, such as scanning and video demonstrations, significantly improve student engagement by making lessons more interactive and practical. Similarly, Maryani et al. (2025) emphasized the importance of gamified mobile learning approaches in increasing student motivation and participation, particularly in remote or resource-constrained educational settings. Additionally, Agustin (2023) noted that multimedia interventions, such as interactive apps, can make learning more enjoyable and promote curiosity, which is consistent with the high scores observed in this study for statements related to curiosity (mean = 4.59) and independent learning (mean = 4.63).

D. Perceived Usefulness of the Scan-and-Learn Mobile App as a Supplementary Learning Tool

Table 4 presents the students perceived usefulness of the Scan-and-Learn Mobile App. The overall weighted mean of **4.70**, interpreted as **Extremely Useful**, indicates that students strongly valued the app as a learning support tool.

Table 4. Level of Students' Perceived Usefulness of the Scan-and-Learn Mobile App as a Supplementary Learning Tool

Statement	Mean	Descriptive Interpretation
The Scan-and-Learn Mobile App served as a helpful reference when I forgot a lesson.	4.97	Extremely Useful
The app complemented what I learned from textbooks and the teacher.	4.61	Extremely Useful
The app helped me prepare the quizzes and exams on kitchen tools and equipment.	4.78	Extremely Useful
The app was a useful guide during practical kitchen activities.	4.73	Extremely Useful
The app provided information that I could not find in class notes alone.	4.52	Extremely Useful
The app was a good supplement to traditional teaching methods.	4.66	Extremely Useful
The app helped me review lessons at my own pace.	4.71	Extremely Useful
The app supported my understanding when classroom explanations were not enough.	4.77	Extremely Useful
The app gave me a practical way to study even outside of school.	4.64	Extremely Useful
The app encouraged me to study independently at home.	4.59	Extremely Useful
Overall Mean	**4.54**	Extremely Useful

***Note**: 4.50-5.00 Extremely Useful, 3.50-4.49 Very Useful, 2.50-3.49 Moderately Useful, 1.50-2.49 Slightly Useful, 1.00-1.49 Not Useful at All*

Among the evaluative statements, the highest-rated item was *"The Scan-and-Learn Mobile App served as a helpful reference when I forgot a lesson,"* with a mean score of 4.97, interpreted as "Extremely Useful." A student shared, *"Whenever I forgot something from class, I could easily check the app and quickly find the information I needed."* This feedback highlights the app's value as a reliable and accessible reference tool for students. On the other hand, the lowest-rated statement, *"The app provided information that I could not find in class notes alone,"* received a mean score of 4.52, which, while still interpreted as "Extremely Useful," indicates that students may have relied more on the app for reinforcement rather than for entirely new information. One student expressed, *"The app was helpful, but most of the information was already covered in class."*

These results suggests that the Scan-and-Learn Mobile App was highly effective as a supplementary learning tool. The consistently high scores across all statements reflect the app's ability to enhance students' learning by providing additional resources, supporting their understanding of lessons, and allowing them to study independently. The highest-rated statement underscores the app's role as a quick and reliable reference for students to revisit lessons they may have forgotten. The slightly lower score for providing new information suggests that while the app was effective in reinforcing classroom content, it may not have introduced substantial new material beyond what was already covered in class.

The implications of these findings are particularly relevant to the context of TVE, where students often require additional resources to master practical and theoretical knowledge. The app's ability to complement traditional teaching methods and provide students with the flexibility to review lessons at their own pace highlights its potential to address challenges such as limited access to physical resources or the need for personalized learning. A student remarked, *"I liked that I could use the app at home to study and prepare for quizzes—it made me feel more confident."* This statement emphasizes the app's role in fostering independent learning and improving students' preparation for assessments. Moreover, the app's usefulness during practical kitchen activities (mean = 4.73) suggests that it provided students with valuable guidance in applying theoretical knowledge to hands-on tasks, a critical component of TVE.

The findings from this study align with existing research on the perceived usefulness of mobile learning tools in education. For instance, Pedraza and Canoy (2025) highlighted that mobile apps are particularly effective as supplementary tools in secondary education, as they help bridge gaps in understanding and provide students with additional resources for review. Similarly, Bawal and Cuenca (2023) emphasized that mobile-based education apps improve student performance by offering flexible, self-paced learning opportunities, which is consistent with the high scores observed for statements related to independent study (mean = 4.59) and reviewing lessons at one's own pace (mean = 4.71). Furthermore, Agustin (2023) noted that interactive multimedia tools serve as valuable references for students, particularly when classroom discussions are insufficient, which aligns with the high score for the app's ability to support understanding when classroom explanations were not enough (mean = 4.77).

E. Level of Satisfaction with the App

Table 5 shows the level of student satisfaction with the Scan-and-Learn Mobile App. The overall weighted mean of **4.72**, interpreted as **Very Satisfied**, indicates that students had highly positive experiences with the app

Table 5. Level of Student Satisfaction with the Scan-and-Learn Mobile App

Statement	Mean	Descriptive Interpretation
The Scan-and-Learn Mobile App was easy to navigate and use.	4.69	Very Satisfied
I was satisfied with the speed of scanning kitchen tools and equipment	4.69	Very Satisfied
The app worked well with the device I used	4.62	Very Satisfied
The instructions in the app were clear and easy to follow	4.76	Very Satisfied

Statement	Mean	Descriptive Interpretation
The app provided quick access to information about kitchen tools and equipment	4.77	Very Satisfied
The design and layout of the app made learning comfortable	4.87	Very Satisfied
The app was accessible whenever I needed to study	4.66	Very Satisfied
I was satisfied with the clarify of the videos and definitions in the app	4.61	Very Satisfied
The app made my learning experience more convenient	4.70	Very Satisfied
I am satisfied with the Scan-and-Learn Mobile App as a learning support.	4.81	Very Satisfied
Overall Mean	**4.54**	Very Satisfied

***Note**: 4.50-5.00 Very Satisfied, 3.50-4.49 Satisfied, 2.50-3.49 Neutral, 1.50-2.49 Dissatisfied, 1.001.49 Very Dissatisfied*

Among the evaluative statements, the highest-rated item was *"The design and layout of the app made learning comfortable,"* with a mean score of 4.87, interpreted as "Very Satisfied." A student shared, *"The app's layout was simple and user-friendly, which made learning feel less stressful and more enjoyable."* This feedback highlights the importance of intuitive design in enhancing the user experience. On the other hand, the lowest-rated statement, *"I was satisfied with the clarity of the videos and definitions in the app,"* received a mean score of 4.61, which, while still interpreted as "Very Satisfied," suggests that the app's multimedia content met students' expectations but could still be refined for greater clarity. One student commented, *"The videos were helpful, but some parts could have been explained more clearly."*

The findings suggest that the Scan-and-Learn Mobile App effectively met students' expectations as a supplementary learning tool. The consistently high scores across all statements reflect the app's usability, accessibility, and ability to provide a convenient and supportive learning experience. The highest-rated statement emphasizes the role of a well-designed interface in making the learning process more comfortable and engaging, while the slightly lower-rated statement on video clarity suggests potential areas for improvement in the app's multimedia content.

The implications of these findings are particularly significant in TVE where students often require tools that are easy to navigate and provide quick access to information. The app's ability to provide clear instructions, fast scanning, and convenient access to learning materials highlights its potential to address challenges such as limited time for review and the need for on-demand learning support. A student remarked, *"I liked how I could use the app anytime I needed it—it made studying so much easier and more convenient."* This statement underscores the app's role in making learning more flexible and accessible for students. Additionally, the high satisfaction with the app's design and layout (mean = 4.87) suggests that creating a user-friendly interface is critical for ensuring positive learning experiences.

These findings align with existing research on student satisfaction with mobile learning tools. For instance, Pedraza and Canoy (2025) found that user-friendly design and accessibility are key factors in determining students' satisfaction with educational apps. Similarly, Chakraborty (2023) emphasized that clear instructions and ease of navigation significantly enhance the usability of EdTech tools, which aligns with the high scores observed in this study for statements related to navigation (mean = 4.69) and clarity of instructions (mean = 4.76). Furthermore, Bawal and Cuenca (2023) noted that mobile-based education apps improve students' convenience in accessing learning materials, consistent with the high score for the app's ability to provide quick and easy access to information (mean = 4.77).

Conclusion

Based on the findings of this study, the Scan-and-Learn Mobile App has proven to be an effective supplementary learning tool for enhancing students' knowledge, skills, engagement, motivation, and overall satisfaction in learning about kitchen tools and equipment in the context of Technical and Vocational Education (TVE). The app successfully supported students in understanding and recalling concepts, developing practical skills, and fostering independent learning through its interactive features and user-friendly design.

The app significantly enhanced students' knowledge of kitchen tools and equipment, allowing them to better recognize, classify, and recall information. Its ability to provide clear definitions, detailed explanations, and accessible references helped reinforce classroom learning and deepen students' understanding. Additionally, the app played a key role in improving students' practical skills, particularly in the proper operation, maintenance, and safety handling of kitchen equipment. The step-by-step instructional videos and demonstrations provided a structured and accessible way for students to practice and refine their skills independently, building confidence and competence.

In terms of engagement and motivation, the app created an interactive and enjoyable learning environment that encouraged curiosity and active participation. Students expressed enthusiasm for using the app, as it allowed them to explore topics beyond the classroom and study at their own pace. While the app was effective in sustaining interest, there is potential for further improvement by incorporating gamified elements or dynamic activities to make the learning experience even more stimulating.

The app was also perceived as a highly useful tool for learning, serving as a reliable reference and practical guide for both theoretical and hands-on activities. It complemented traditional teaching methods by providing flexible learning opportunities, supporting independent study, and reinforcing classroom content. Students appreciated its accessibility and convenience, which made studying less stressful and more manageable.

Overall, students were highly satisfied with the app, particularly its intuitive design, clear instructions, and ease of use. The app's layout and functionality contributed to a comfortable and positive learning experience, although there is room for improvement in refining the clarity of its multimedia content to further enhance user satisfaction.

Given these findings, the app's potential to address challenges in schools with limited resources is particularly noteworthy. Public schools with limited access to physical kitchen equipment can adopt the Scan-and-Learn Mobile App as a cost-effective solution to provide students with interactive and practical learning experiences. By leveraging this technology, schools can bridge gaps in resources and ensure students are equipped with the necessary knowledge and skills to succeed in TVE.

For future research, it is recommended to conduct a longitudinal study to assess whether the knowledge gained through the app is retained over time. This would help determine the app's long-term effectiveness in reinforcing learning outcomes and sustaining knowledge retention. Additionally, integrating hands-on practice with the app and exploring its application in other areas of TVE could further enhance its impact and scalability.

In conclusion, the Scan-and-Learn Mobile App has demonstrated its effectiveness as an innovative educational tool that enhances learning in TVE. Its interactive features, practical applications, and user-friendly design make it a valuable resource for both teachers and students. By adopting this technology, schools, particularly those with limited resources, can provide students with meaningful and engaging learning experiences. With continued improvements and further research, the app has the potential to play a transformative role in modernizing and enriching TVE education

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