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Acceptability of Multi-Trainer System for Instructional Delivery in Electronics Technology

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Abstract

This study investigates the acceptability of a customized multi-trainer system utilizing Arduino microcontroller technology for educational purposes. Through comprehensive data analysis, notable disparities in the availability of components across different campus settings were revealed, emphasizing the challenges students face in sourcing essential materials for academic projects. Despite these challenges, student and faculty perceptions of the developed multi-trainer system were overwhelmingly positive, highlighting its user-friendly interface, customization capabilities, and alignment with educational goals. The system's potential to complement traditional teaching methods and enhance learning experiences was recognized by both students and faculty members. Recommendations for improving resource accessibility and refining the system to meet evolving educational needs are provided based on study findings. Overall, this study contributes to the ongoing evolution of educational technology, emphasizing the importance of addressing resource accessibility challenges and promoting innovative solutions to enhance learning outcomes.

Article Info

Keywords:
multi-trainer system, Arduino microcontroller technology, educational technology

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INTRODUCTION

In a global context, the demand for adaptable and personalized learning solutions has become increasingly evident. Traditional trainer systems often struggle to meet the diverse needs of learners, resulting in suboptimal training outcomes. The design and utilization of e-TPCK, a self-paced adaptive electronic learning environment designed to promote the development of teachers' Technological Pedagogical Content Knowledge (TPCK). The system employs a technological solution that promotes teachers' ongoing TPCK development by engaging them in personalized learning experiences using technology-infused design scenarios (Christodoulou, Angeli, 2022). The limitations of generic training approaches highlight the pressing need for innovative solutions that can cater to individual learning styles, skill levels, and objectives. This research addresses the overarching global problem by proposing to design a customized multi-trainer system using Arduino Microcontroller, a platform known for its versatility and programmability.

In the specific context of the Philippines, the need for tailored training solutions is even more pronounced. The educational landscape in the country faces unique challenges, with resource constraints and limited access to advanced technologies hindering the development of effective learning environments. By focusing on the local context, this research aims to contribute to the improvement of training methodologies in the Philippines, fostering a more inclusive and adaptive approach to education.

In the context of Pangasinan State University, specifically within the Lingayen campus under the College of Industrial Technology, a discernible gap in resources and learning materials has emerged, particularly in the domain of mechatronics. Despite the inclusion of courses such as ECT 10, which delve into the intricacies of mechatronics, the current state of available resources for teaching falls short. This inadequacy significantly impacts the quality of education provided to students who harbour a keen interest in mastering the complexities of mechatronics.

The crux of the matter lies in the limited resources for teaching, particularly the absence of a well-equipped training system. This gap creates a notable disparity between theoretical knowledge and practical application, posing a substantial hindrance to the holistic development of students in the field of mechatronics. The absence of tangible trainers specifically designed to enhance their learning with microcontrollers is particularly glaring. As a result, students are left with resorting to online platforms, such as YouTube and other social media channels, as their primary means of familiarizing themselves with practical applications. This reliance on external, non-curated sources further exacerbates the challenge of bridging the gap between theoretical instruction and hands-on experience, impeding the comprehensive development of students in this critical field. Addressing this resource gap is imperative to ensure that students receive a well-rounded education that aligns with the demands and advancements in the field of mechatronics.

In this light, the researcher decides to conduct the study, this research tackles a global issue by proposing a solution in the form of a customized multi trainer system using Arduino Microcontroller. The need for such a system is particularly evident in the Philippines, where resource constraints pose challenges to effective education. In the specific academic context of Pangasinan State University's Lingayen campus under the College of Industrial Technology, the inadequacy of resources for teaching mechatronics creates a pressing need for a practical and adaptable training solution. This study seeks to bridge these gaps and contribute to the enhancement of learning experiences in mechatronics education at both the national and local levels.

LITERATURE REVIEW

The integration of multi-trainer systems in instructional delivery has been extensively explored in technical education, particularly in electronics technology. Various studies underscore the pivotal role of hands-on learning tools in fostering student engagement and deepening comprehension of complex electronic concepts. Navasca (2022) developed the Digital Electronics Trainer with Arduino to address the limitations of conventional digital electronics trainers, offering a more portable and cost-effective alternative that improves student learning outcomes. His study highlights the effectiveness of integrating Arduino-based trainers in electronics education, demonstrating their potential in enhancing practical competencies and optimizing instructional efficiency.

Similarly, research on multi-purpose electrical circuit demonstration trainers validates their acceptability among educators and students, reinforcing their significance in instructional design. Antonio (2020) evaluated a multi-purpose electrical circuit trainer, finding that its design, construction, functionality, and safety were

highly rated by both instructors and learners. The study concluded that such trainers significantly augment instructional delivery by providing real-world applications of electrical circuit principles. Bartolome (2020) further explored the development of an industrial motor control system trainer, which was found to be particularly effective in technical education settings. By facilitating hands-on learning experiences, these trainers strengthen the connection between theoretical understanding and practical applications.

A key factor influencing the acceptability of instructional trainers is their usability, effectiveness, and alignment with industry standards. Candano and Cuasito (2024) examined the development of a microcontroller programming training kit, emphasizing its role in preparing students for Industry 4.0. Their findings suggest that well-designed instructional trainers substantially enhance student engagement and practical skill acquisition, underscoring the need for continuous innovation in technical education. Similarly, Bajet (2015) investigated the design and development of an electric motor controller trainer, concluding that improvised instructional devices could effectively supplement laboratory-based learning in electronics technology.

Further, the application of remote-controlled digital electronics trainers has been explored to improve accessibility and interactivity in electronics education. A study on the Remote-Controlled Digital Electronics Trainer Board (RCDET) demonstrated the advantages of incorporating microcontrollers and infrared technology into instructional trainers, enabling students to engage with digital electronics concepts in an interactive manner. These findings complement Navasca's (2022) study advocating the integration of Arduino-based trainers to enrich student learning experiences. As digital transformation reshapes educational methodologies, adaptive training tools that leverage emerging technologies become increasingly vital.

The effectiveness of multi-trainer systems is closely linked to competency-based education frameworks, reinforcing technical skills through structured, hands-on training. Research on instructional trainers for electrical power installation courses highlights the importance of interactive learning tools in skill development. Studies suggest that competency-based training models, when combined with instructional trainers, contribute to improved student performance and industry readiness. Additionally, the incorporation of structured educational methodologies, such as the ADDIE model, has proven beneficial in refining the design and implementation of instructional trainers, ensuring their relevance in evolving technological landscapes.

Sutono Skom (2022) introduces further innovations in this domain with his Design Trainer Board of Arduino Microcontroller, which aligns with the broader need for efficient and user-friendly learning modules in Industrial Electronics Engineering. His work emphasizes the significance of practical experiences in enhancing students' understanding of microcontroller programming and hardware components. Given the recurrent challenges in engineering education—including errors in power cable installation that risk damaging critical components such as Arduino modules, sensor modules, ICs, and transistors—his study advocates for the integration of protective mechanisms within instructional trainers. His proposal for an Arduino microcontroller trainer equipped with diode protection addresses this issue, safeguarding components while facilitating an uninterrupted learning experience. This innovation is consistent with the educational literature that promotes the development of adaptive and reliable training tools to ensure a conducive learning environment.

Expanding the discourse on Arduino applications in technical education, Ong et al. (2022) conducted an impact assessment on an introductory Arduino programming training program for junior high school students. This study, undertaken at the University of Science and Technology of Southern Philippines, evaluates the effectiveness of programming training in fostering essential skills. Using both focus group discussions and survey questionnaires, the research provides qualitative and quantitative perspectives on the training program's influence. The findings highlight a contrast between initial apprehensions regarding Arduino programming and subsequent positive perceptions of skill development and learning engagement. This aligns with prior research that emphasizes tailored training programs as effective pedagogical strategies to mitigate challenges in programming education. By assessing student and trainer perspectives on course content, instructional strategies, and hands-on activities, this study contributes valuable insights into optimizing programming education for beginners.

Taken together, these studies substantiate the acceptability and effectiveness of multi-trainer systems for instructional delivery in electronics technology. By bridging theoretical knowledge with real-world applications, multi-trainer systems provide students with practical learning experiences that cultivate industry-relevant competencies. The integration of Arduino-based trainers, microcontroller programming kits, and competency-based instructional tools underscores the transformative potential of adaptive learning

technologies in technical education. As institutions continue to innovate pedagogical strategies, systematic research and development of multi-trainer systems remain essential in ensuring sustainable learning outcomes.

METHODOLOGY

1. Objective Definition

- To know the acceptability of developed customized multi-trainer system using an Arduino microcontroller that meets the specific needs of electronics technology education at Pangasinan State University.

2. Scenario Development

- The research was identified and developed realistic scenarios that reflect the common challenges and workflows faced by students and faculty in electronics technology courses. These scenarios was used to guide the design and development of the multi-trainer system.

3. Setup and Configuration

- The research has involved programming the Arduino microcontroller using appropriate software to control the system's functionalities.
- The system was assembled on a sturdy wooden platform with strategically placed terminal blocks for modularity and customization.

4. Step-by-Step Execution

- Phase 1: Literature Review: A comprehensive review of existing multi-trainer systems, Arduino applications, and related technologies will be conducted to understand the current landscape and identify potential gaps and opportunities.
- Phase 2: Needs Assessment: Senior faculty members specializing in electronics technology and students pursuing a Bachelor of Industrial Technology major in Electronics at Pangasinan State University will be surveyed and interviewed to gather their specific requirements and preferences for the multi-trainer system.
- Phase 3: Conceptual Design: Based on the literature review and needs assessment, a conceptual design for the multi-trainer system was developed, outlining the system architecture and functionalities.
- Phase 4: Prototyping: A functional prototype of the multi-trainer system will be built, incorporating hardware integration, coding, and testing.
- Phase 5: User Evaluation: The prototype was evaluated by the senior faculty members and students to gather feedback on its usability, effectiveness, and alignment with their teaching requirements.
- Phase 6: Iterative Development: Based on the user evaluations, the multi-trainer system will be iteratively refined and improved through design modifications, coding adjustments, and further testing.

5. Data Collection

- Survey: A structured questionnaire was used to gather data from senior faculty members and students.
- Interviews: Interviews were conducted to supplement the questionnaire and provide more in-depth qualitative insights.
- Performance Metrics: Data was collected on the system's performance, including usability, efficiency, and effectiveness in meeting user needs.

6. Evaluation and Iteration

- The collected data was analyzed using descriptive statistics and thematic analysis to identify patterns, preferences, and areas for improvement.
- The multi-trainer system was iteratively refined based on the analysis of the collected data, ensuring that it meets the specific needs of the users and contributes to the advancement of Arduino-based applications in education.

7. Conclusion and Next Steps

Based on the results of this study, it is concluded that the assessment of the acceptability of the developed multi-trainer system among students and faculty yielded positive results, indicating its acceptability and

usability within the electronics technology program at Pangasinan State University. Both students and faculty expressed familiarity with the system's features and functionalities, finding it to be user-friendly and supportive of traditional teaching methods. Moreover, the system's customization capabilities and alignment with program requirements were highly appreciated, suggesting its potential to enhance teaching and learning experiences. Overall, the high level of acceptability among both students and faculty underscores the value of the multi-trainer system as a practical and effective tool for advancing education in electronics technology.

RESULTS & DISCUSSION

Assessing the level of acceptability of a developed multi-trainer system is pivotal in gauging its effectiveness and relevance in real-world applications. This examination provides valuable insights into the system's reception among users, highlighting strengths, weaknesses, and areas for improvement. Understanding the acceptability of the system offers valuable feedback for refining its design and functionality to better meet user expectations and requirements. This study investigates the level of acceptability of the developed multi-trainer system, offering valuable perspectives on its usability, satisfaction, and potential for adoption in practical training scenarios.

Level of Acceptability of the Developed Multi-Trainer System – Students in terms of Familiarity with the Multi-Trainer System

n=40

	Familiarity with the Multi-Trainer System		SD	D	N	A	SA	AWM	VI
1.	I am familiar with the features of the developed multi-trainer system.	f	2	1	11	25	1	**3.55**	A
		%	5	2.5	27.5	62.5	2.5		
2.	I am familiar with the functionalities of the developed multi-trainer system.	f	2	2	9	26	1	**3.55**	A
		%	5	5	22.5	65	2.5		
3.	I find the user interface of the multi-trainer system easy to navigate.	f	0	3	20	15	2	**3.40**	N
		%	0	7.5	50	37.5	5		
		Mean						**3.50**	N

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 1

The table illustrates students' perceptions of the developed multi-trainer system, focusing on familiarity with its features, functionalities, and user interface. Results indicate a high level of familiarity among students with both the features (62.5% agreement) and functionalities (65% agreement) of the system, suggesting effective introduction and explanation of its key aspects. However, opinions on the user interface are more varied, with 50% remaining neutral and 12.5% expressing disagreement regarding its ease of navigation. While the majority of students find the system's features and functionalities familiar, there is room for improvement in enhancing the user interface to ensure a more intuitive and user-friendly experience. This data underscores the importance of considering user feedback and usability testing in the development of educational technology systems to optimize user acceptance and engagement. Relevant literature supporting these findings includes research by Norman (2013) on user interface design principles in educational technology and studies by Davis (1989) and Venkatesh et al. (2003) evaluating user acceptance of learning management systems or educational software.

Level of Acceptability of the Developed Multi-Trainer System – Students in terms of Ease of Use

n=40

	Ease of Use		SD	D	N	A	SA	AWM	VI
1.	The multi-trainer system is user-friendly.	f	2	0	11	20	7	**3.75**	A
		%	5	0	27.5	50	17.5		
2.	The system complements and supports traditional teaching methods effectively.	f	1	3	2	24	10	**3.98**	A
		%	2.5	7.5	5	60	25		
3.	The system allows for customization to meet the specific needs of different courses.	f	0	2	5	21	12	**4.08**	A
		%	0	a	12.5	52.5	30		
			Mean					**3.94**	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 2

Table 2 presents students' perceptions of the developed multi-trainer system in terms of its ease of use and effectiveness in complementing traditional teaching methods and allowing for customization. Results indicate a high level of acceptability, with 67.5% to 92.5% of students agreeing or strongly agreeing with the statements. The majority of students find the system user-friendly (67.5% agreement) and believe it effectively complements traditional teaching methods (85% agreement) and allows for customization to meet specific course needs (82.5% agreement). These findings suggest that the multi-trainer system is well received by students and holds promise for enhancing learning experiences through its user-friendly interface, alignment with traditional teaching methods, and flexibility in accommodating diverse educational needs. Relevant literature supporting these findings includes research on user acceptance of educational technology (Davis, 1989; Venkatesh et al., 2003) and studies exploring the effectiveness of technology-enhanced learning environments in higher education (Hew & Cheung, 2003; Hung & Khine, 2006).

Level of Acceptability of the Developed Multi-Trainer System – Students in terms of Alignment with Curriculum

n=40

	Alignment with Curriculum		SD	D	N	A	SA	AWM	VI
1.	The multi-trainer system aligns well with the teaching requirements and goals of the electronics technology program.	f	1	0	7	18	14	**4.10**	A
		%	2.5	0	17.5	45	35		
2.	The system complements and supports traditional teaching methods effectively.	f	1	1	9	22	7	**3.83**	A
		%	2.5	2.5	22.5	55	17.5		
3.	The system allows for customization to meet the specific needs of different courses.	f	2	3	3	24	8	**3.83**	A
		%	5	7.5	7.5	60	20		
			Mean					**3.92**	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 3

The table 3 depicts students' perceptions of the developed multi-trainer system's alignment with the curriculum, focusing on its compatibility with teaching requirements and goals of the electronics technology program, its effectiveness in complementing traditional teaching methods, and its customization capabilities. Results reveal a high level of acceptability, with 80% to 95% of students expressing agreement or strong agreement with the statements. The majority of students perceive that the multi-trainer system aligns well with the teaching requirements and goals of the electronics technology program (80% agreement), effectively complements traditional teaching methods (77.5% agreement), and allows for customization to meet specific course needs (80% agreement). These findings suggest that the multi-trainer system is perceived as being closely aligned with the curriculum, supporting traditional teaching methods, and offering flexibility to accommodate diverse educational needs. Relevant literature supporting these findings includes research on curriculum alignment in educational technology (Glatthorn & Baron, 1991; Reigeluth, 1999) and studies exploring the integration of technology in vocational education programs (Norton et al., 2001; Ward et al., 2012).

In table 4 presents students' overall satisfaction with the developed multi trainer system, encompassing their satisfaction with its features and functionalities, usability for both faculty and students, and its impact on teaching or learning experiences. The results indicate a high level of acceptability, with 77.5% to 95% of students expressing agreement or strong agreement with the statements. The majority of students report being satisfied with the features and functionalities of the multi-trainer system (77.5% agreement), rating its overall usability positively (77.5% agreement), and acknowledging its positive impact on their teaching or learning experiences (82.5% agreement). These findings suggest that the multi trainer system is well-received by students, meeting their expectations in terms of features, usability, and educational benefits. Relevant literature supporting these findings includes research on user satisfaction with educational technology systems (Liu et al., 2010; Yen & Liu, 2009) and studies evaluating the effectiveness of technology-enhanced learning environments (Hew & Cheung, 2003; Hung & Khine, 2006).

Level of Acceptability of the Developed Multi-Trainer System – Students in terms of Overall Satisfaction

n=40

	Overall Satisfaction		SD	D	N	A	SA	AWM	VI
1.	Overall, how satisfied are you with the features and functionalities of the multi-trainer system?	f	2	2	5	20	11	**3.90**	A
		%	5	5	12.5	50	27.5		
2.	How would you rate the overall usability of the multi-trainer system for both faculty and students?	f	0	1	8	19	12	**4.05**	A
		%	0	2.5	20	47.5	30		
3.	The multi-trainer system has positively impacted my teaching or learning experience.	f	0	2	5	20	13	**4.10**	A
		%	0	5	12.5	50	32.5		
		Mean						**4.02**	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 4

Level for Acceptability of the Developed Multi-Trainer System – Students- Overall Mean

n=40

CRITERIA	MEAN	VERBAL INTERPRETATION
1. **Familiarity with the Multi-Trainer System**	3.50	NEUTRAL
2. **Ease of Use**	3.94	AGREE
3. **Alignment with Curriculum**	3.92	AGREE
4. **Overall Satisfaction**	4.02	AGREE
Overall Mean	3.85	AGREE

Table 5

The findings from the survey conducted among 40 students which are third year and fourth year Bachelor or Industrial Technology students from Lingayen and Asingan Campus – 35 from Lingayen and 5 from Asingan, regarding the acceptability of the developed multi-trainer system provide valuable insights into the usability of the system within the educational context. The students were primarily from Lingayen Campus (35 students) with a minority from Asingan Campus (5 students). The criteria assessed various aspects of the system, ranging from familiarity with features and functionalities to overall satisfaction and impact on teaching and learning experiences.

The findings suggest that the developed multi-trainer system holds promise as an effective educational tool within the electronics technology program. However, it is important to address any areas of improvement highlighted by the feedback to further enhance its usability, relevance, and overall acceptance among the user base. Future research could delve deeper into specific aspects of the system's functionality and its impact on learning outcomes to provide further insights into its usability within the educational setting.

Level of Acceptability of the Developed Multi-Trainer System – Faculty in terms of Familiarity with the Multi-Trainer System

n=7

Familiarity with the Multi-Trainer System		SD	D	N	A	SA	AWM	VI
1. I am familiar with the features of the developed multi-trainer system.	f	0	0	1	2	4	4.43	A
	%	0	0	14.28	28.57	57.14		
2. I am familiar with the functionalities of the developed multi-trainer system.	f	0	0	0	5	2	4.29	A
	%	0	0	0	71.43	28.57		
3. I find the user interface of the multi-trainer system easy to navigate.	f	0	1	1	3	2	3.86	N
	%	0	14.28	14.28	42.86	28.57		
		Mean					4.19	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 6

The tables 6 and 7 depict faculty members' perceptions of the developed multi-trainer system in terms of familiarity, ease of use, and customization capabilities. Results indicate a high level of acceptability among faculty members, with mean scores ranging from 3.86 to 4.57, all interpreted as agreement or strongly agree. Faculty members exhibit a strong familiarity with the features (57.14% strongly agree) and functionalities (71.43% agree) of the system. Additionally, they perceive the system as highly user-friendly (57.14% strongly agree) and effective in complementing traditional teaching methods (57.14% strongly agree). Moreover, faculty members acknowledge the system's capability for customization to meet the specific needs of different courses (85.71% agree). These findings suggest that the multi-trainer system is well-received by faculty members, who recognize its features, ease of use, and adaptability to support teaching objectives effectively. Relevant literature supporting these findings includes research on faculty perceptions and acceptance of educational technology systems (Albirini, 2006; Davis, 1989) and studies exploring the integration of technology in higher education (Graham et al., 2009; Mishra & Koehler, 2006).

Level of Acceptability of the Developed Multi-Trainer System – Faculty in terms of Ease of Use

n=7

	Ease of Use		SD	D	N	A	SA	AWM	VI
1.	The multi-trainer system is user-friendly.	f	0	0	0	3	4	4.57	SA
		%	0	0	0	42.86	57.14		
2.	The system complements and supports traditional teaching methods effectively.	f	0	0	1	2	4	4.43	A
		%	0	0	14.28	28.57	57.14		
3.	The system allows for customization to meet the specific needs of different courses.	f	0	0	0	6	1	4.14	A
		%	0	0	0	85.71	14.28		
		Mean						**4.38**	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 7

Level of Acceptability of the Developed Multi-Trainer System – Faculty in terms of Alignment with Curriculum

n=7

	Alignment with Curriculum		SD	D	N	A	SA	AWM	VI
1.	The multi-trainer system aligns well with the teaching requirements and goals of the electronics technology program.	f	0	0	1	3	3	4.29	A
		%	0	0	14.28	42.86	42.86		
2.	The system complements and supports traditional teaching methods effectively.	f	0	0	0	6	1	4.14	A
		%	0	0	0	85.71	14.28		
3.	The system allows for customization to meet the specific needs of different courses.	f	0	0	0	6	1	4.14	A
		Mean						4.19	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 8

In terms of its alignment with the curriculum and overall satisfaction. Results indicate a high level of acceptability among faculty members, with mean scores ranging from 4.19 to 4.47, all interpreted as agreement or strongly agree. Faculty members perceive the system as aligning well with the teaching requirements and

goals of the electronics technology program (85.71% agree), effectively complementing traditional teaching methods (85.71% agree), and allowing for customization to meet specific course needs (85.71% agree). Additionally, faculty members express high levels of overall satisfaction with the features and functionalities of the system (57.14% strongly agree), its usability for both faculty and students (71.43% strongly agree), and its positive impact on teaching or learning experiences (71.43% strongly agree). These findings suggest that the multi-trainer system is well-received by faculty members, who recognize its alignment with curriculum objectives, effectiveness in supporting teaching methods, and overall satisfaction with its features and functionalities.

Level of Acceptability of the Developed Multi-Trainer System – Faculty in terms of Overall Satisfaction

n=7

	Overall Satisfaction		SD	D	N	A	SA	AWM	VI
1.	Overall, how satisfied are you with the features and functionalities of the multi-trainer system?	f	0	0	0	4	3	4.43	A
		%	0	0	0	57.14	42.86		
2.	How would you rate the overall usability of the multi-trainer system for both faculty and students?	f	0	0	0	2	5	4.71	SA
		%	0	0	0	28.57	71.43		
3.	The multi-trainer system has positively impacted my teaching or learning experience.	f	0	0	0	5	2	4.29	A
		%	0	0	0	71.43	28.57		
		Mean						**4.47**	A

Legend: *5- Strongly Agree (SA); 4 – Agree (A); 3 – Neutral (N); 2 – Disagree (D); 1- Strongly Disagree (SD)*

Table 9

Level for Acceptability of the Developed Multi-Trainer System – Faculty-Overall Mean

n=7

	CRITERIA	MEAN	VERBAL INTERPRETATION
1.	**Familiarity with the Multi-Trainer System**	4.19	NEUTRAL
2.	**Ease of Use**	4.38	AGREE
3.	**Alignment with Curriculum**	4.19	AGREE
4.	**Overall Satisfaction**	4.47	AGREE
	Overall Mean	4.31	AGREE

Table 10

The survey conducted among 7 faculty members, 6 from from Lingayen Campus and 1 from Asingan Campus, provides valuable insights into their perceptions of the developed multi-trainer system's acceptability and usability.

The majority of faculty members agree or strongly agree that the multi-trainer system aligns well with the teaching requirements and goals of the electronics technology program, as indicated by an AWM of 4.29. Faculty members express high levels of satisfaction with the features and functionalities of the multi-trainer system (AWM: 4.43). Additionally, the system has a positive impact on their teaching or learning experiences,

with an AWM of 4.29. Faculty members rate the overall usability of the multi-trainer system highly, with an AWM of 4.71. The majority strongly agree that the system is usable for both faculty and students. They find it familiar, user-friendly, effective in complementing traditional teaching methods, and aligned with program requirements and goals. The system's customization capabilities and overall satisfaction levels are also noteworthy. These findings highlight the system's potential to enhance teaching and learning experiences within the electronics technology program. However, it's essential to continue gathering feedback and making iterative improvements to ensure continued acceptability and usability.

CONCLUSION

To optimize the usability and sustainability of the developed multi-trainer system within the electronics technology program at Pangasinan State University, it is recommended to establish a structured feedback mechanism to continuously gather input from students and faculty for refining the system's features. Efforts should be made to address resource gaps by securing additional funding or partnerships to ensure consistent access to necessary components. Investing in training and support initiatives, such as workshops and online resources, can aid users in familiarizing themselves with the system, while integrating it extensively into the curriculum will provide students with practical hands-on experience. Additionally, institutional commitment is essential for long-term sustainability, requiring funding for maintenance, dedicated personnel for oversight, and a culture of innovation and collaboration. By implementing these recommendations, the university can enhance the overall teaching and learning experiences within the electronics technology program.

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