2025 Jurnal Kejuruteraan, Teknologi dan Sains Sosial
Journal of Engineering, Technology and Social Science
Volume 11 Issue 1, e-ISSN: 27166848

EVALUATION OF USER EXPERIENCE IN ADAPTIVE STICK FOR BLIND SOCIETY SARAWAK MALAYSIA USING USER EXPERIENCE QUESTIONNAIRE (UEQ)

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ARTICLE INFO

Article history:
Received
08 January 2025
Received in revised form
12 April 2025
Accepted
13 April 2025
Published online
01 June 2025

Keywords:
User Experience, Assistive Technology ; Adaptive Stick ; Visually Impaired ; User-Centered Design

ABSTRACT

This study evaluates the user experience of the Adaptive Stick designed for the Blind Society in Sarawak, Malaysia, utilizing the User Experience Questionnaire (UEQ) method. The Adaptive Stick developed as part of a Corporate Social Responsibility (CSR) initiative and knowledge transfer program. The study aims to enhance mobility and independence for visually impaired individuals. A quantitative approach was employed, with data collected through the questionnaire interview to users of the Adaptive Stick. The UEQ framework, comprise of six scales which are Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty was utilized to evaluate various aspects of user experience. The results indicate the positive user experience, with high scores in attractiveness (2.58) and stimulation (2.69), suggesting that users find the device engaging and visually appealing. However, areas for improvement were identified, particularly in perspicuity and dependability, which received scores of 2.00 and 1.56, respectively. These findings highlight the need for enhancements in understanding and reliability to foster greater user confidence. This evaluation emphasizes the significance of user-centred design in developing assistive technologies. The lesson gained from this study can inform future iterations of the Adaptive Stick to ensure it meets the needs of visually impaired users more effectively. Overall, the research contributes to the understanding of user experience in assistive devices and emphasizes the importance of continuous improvement based on user feedback.

1. Introduction

The visually impaired community faces significant challenges in navigating their surroundings, which can block their independence and overall quality of life (Ntakolia, Dimas & Iakovidis, 2022). The need for effective assistive technologies is critical to empower individuals with visual impairments and enhance their mobility (MacNeil et al., 2024). Among these technologies, the Adaptive Stick has been developed as a mobility aid designed to assist users in safely and confidently navigating their environments (Jain et al., 2022).
This study is important as it is part of a Corporate Social Responsibility (CSR) initiative aimed

at improving the lives of visually impaired individuals through the offering of helpful tools of adaptive technologies. The collaboration with the Blind Society of Sarawak emphasizes the importance of knowledge transfer and community engagement in the development and implementation of assistive devices. By using ideas from the Blind Society, this research aims to ensure that the Adaptive Stick is fit to meet the specific needs and preferences of its users.

User experience (UX) is a very important factor in the successful adoption of assistive technologies (Pohjolainen, 2020). A positive user experience can lead to increased satisfaction, usability, and eventually, greater independence for visually impaired individuals (Chaudhary et al., 2023). To comprehensively evaluate the user experience of the Adaptive Stick, this study employs the User Experience Questionnaire (UEQ), a validated tool that evaluates various dimensions of user experience, including attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty (User Experience Questionnaire, 2018). The primary objective of this study is to evaluate the user experience of the Adaptive Stick among visually impaired individuals in Sarawak, utilizing the UEQ method. The findings will give useful ideas about how well the Adaptive Stick meets user expectations and identify areas for improvement. This research not only contributes to the existing body of knowledge on assistive technologies but also aims to inform future design enhancements that can better serve the visually impaired community.

This paper is structured as follows: the next section will review relevant literature on assistive technologies and user experience. Next, the methodology section will outline the research design, data collection, and analysis processes. Then, the results and discussion section will present the findings from the user experience evaluation and interpret these findings in the context of existing research. Lastly, concluding with recommendations for future design improvements.

2. Literature Review

Assistive technologies play an important role in improving the mobility, independence, and quality of life of people with visual impairments (Maisha Mashiata et al., 2022). Mobility aids like the Adaptive Stick offer essential support that allows users to navigate their surroundings with greater confidence and security. Furthermore, the positive influence of these devices on users' independence emphasizes the need for well-designed, accessible tools fitted to the needs of visually impaired individuals (Lee, Reddie, & Carroll, 2021; Martiniello et al., 2022).

User experience (UX) is a key factor in how effective assistive devices are adopted and utilized. Positive UX can significantly improve user satisfaction and device usage (Panazan & Dulf, 2024). The User Experience Questionnaire (UEQ) is widely used for evaluating UX across multiple dimensions, including attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty (Pratama, Faroqi, & Mandyartha, 2022). Its validated application in varied contexts supports its use to evaluate the Adaptive Stick's UX for visually impaired individuals (Theodorou et al., 2022).

Recent studies mentioned the value of user-centered design to design assistive technology, especially for projects like the Blind Society of Sarawak's Adaptive Stick initiative (Ntakolia, Dimas, & Iakovidis, 2022). To ensure the product's features, align closely with their unique needs, the user has to be involved in the design process to enhance both user usability and overall satisfaction (Gada, Chandarana, & Chudasama, 2023). This approach benefits both the community and the broader CSR goals by supporting effective design improvements.

Moreover, studies demonstrate that the effectiveness of mobility aids relies not only on

technical features but also significantly on user experience (Mandyartha, 2022). For example, (Panazan & Dulf, 2024) found that ease of use and reliability were critical factors for user satisfaction with smart canes. Also, (Monardo, G.et. al.,2021) noted that engaging and motivational factors are essential to enhance user satisfaction with adaptive devices.
Overall, the literature suggests that integrating UX feedback through structured tools like UEQ is crucial to designing effective assistive technologies. By analyzing the Adaptive Stick's user experience, this study aims to guide future design improvements, enhance its practical application within the visually impaired community, and contribute to the broader literature on assistive technology.

3. Materials and Methods

This research used a quantitative approach by collecting questionnaire data using the interview method. Questionnaires Interviews were conducted with four trainees from the Blind Society of Sarawak which received the adaptive blind stick from the CSR program. The survey question has two parts. The first part is on the demography information which contains 5 questions, and the second part is the User Experience Questionnaire (UEQ). The demography questions include gender, age, level of visual impairment, cause of vision loss, and digital competence as shown in Table 1.

Table 1. Demographic Question

Variable	
Gender	Male
	Female
Age	20-29
	30-39
Level of Visual Impairment	90-95%
	95%
	>95%
	Severe
	Complete
Cause of Vision Loss	Since Birth
	Retinopathy
	Benign Tumor
	Diabetes
	Head and Brain Injury
Digital Competence	Low
	Average
	High

User Experience Questionnaire (UEQ) was a validated tool designed to assess various dimensions of user experience, including attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty.

3.1 Research Design

The research design was structured into several stages, as illustrated in Figure 1. The initial stage involved a comprehensive literature review to establish a theoretical framework to understand user experience in assistive technologies. This review informed the selection of the UEQ as the primary evaluation method.

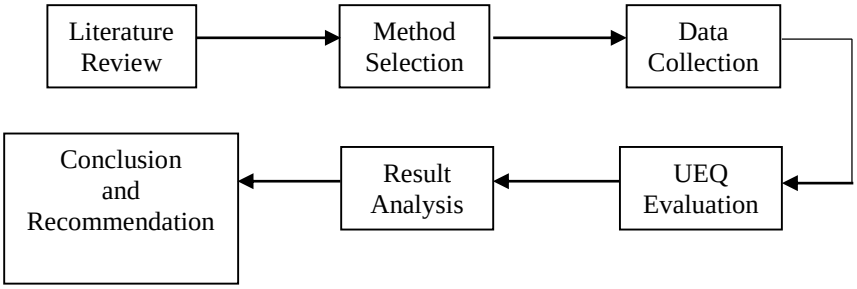

Figure 1. Research Design

3.1.1 Literature Review

This section explores existing research on usability and user experience in assistive technologies, with a particular focus on the Adaptive Stick. By reviewing key studies, we highlight how these technologies enhance mobility and independence for visually impaired individuals (Maisha Mashiata et al., 2022), (Lee et al., 2021), and (Martiniello et al., 2022).
While current research provides a solid foundation for evaluating usability, some gaps remain. For example, while many studies assess general user satisfaction and functionality, few examine how customized features directly empower visually impaired users. Most focus on standard usability metrics rather than incorporating real user feedback into design principles.
Additionally, although the User Experience Questionnaire (UEQ) is a useful tool for measuring aspects like attractiveness and efficiency (User Experience Questionnaire, 2018), more research is needed to validate its effectiveness for specific assistive devices like the Adaptive Stick.
This study aims to fill these gaps by using the UEQ to evaluate the Adaptive Stick's user experience among visually impaired individuals. Working closely with the Blind Society of Sarawak, we'll assess both usability and user satisfaction while providing practical recommendations for improving assistive technology design.

3.1.2 Method Selection

This section details the next essential step in the research by selecting a method for evaluating user experience. Based on the findings obtained from the literature review, the researchers have decided to use the User Experience Questionnaire (UEQ) as the primary assessment tool.
The UEQ is a recognized instrument specifically designed to evaluate various dimensions of user experience, making it well-suited for the Integrated Learning Information System under investigation. The questionnaire comprises 26 paired items, structured to capture contrasting elements of user experience. Each item is rated on a scale from one to seven, enabling participants to convey their perceptions and experiences with precision.

This approach is particularly effective as it offers a thorough evaluation of user experience, that addresses multiple aspects such as usability, satisfaction, and engagement. The comprehensive design of the UEQ allows researchers to collect quantitative data that can be analyzed to extract valuable information regarding user interactions with the system.
Furthermore, Figure 2 in the study provides a complete overview of the UEQ instrument, showcasing the specific items included in the questionnaire. This visual representation enhances understanding of how user experience is measured and ensures transparency in the assessment process. Overall, this phase of method determination is important for ensuring that the research employs a reliable and validated approach to effectively evaluate user experience.

3.1.3 Data Collection

Data collection was conducted using an interview questionnaire with the Adaptive Stick user. The UEQ instrument from (User Experience Questionnaire, 2018) was used which consisted of 26 items, each measured on a 7-point Likert scale, ranging from 1 (negative) to 7 (positive). The questionnaire was designed to capture participants' perceptions of the Adaptive Stick across the six UX dimensions outlined in the UEQ framework. The study targeted users of the Adaptive Stick from the Blind Society of Sarawak. A total of four participants from the Blind Society of Sarawak, each provided with the adaptive blind stick, were recruited as a research sample. Participants were informed about the purpose of the study and provided consent to participate. The data was collected two months after they began using the adaptive stick.

3.1.4 User Experience Questionnaire (UEQ) Evaluation

The UEQ was selected for this study due to its robustness and ability to provide a comprehensive assessment of user experience. The questionnaire items were adapted to reflect the specific context of the Adaptive Stick, ensuring relevance to the participants' experiences as shown in Figure 2. The six scales measured were:

- **Attractiveness:** The overall attraction of the Adaptive Stick. Example: likes or dislikes.
- **Perspicuity:** The clarity or ease of understanding of the device's functionality. Example: easy to understand or difficult to understand
- **Efficiency:** The effectiveness of the Adaptive Stick in facilitating quick and successful navigation. Example: sooner or later, practical or impractical.
- **Dependability:** The reliability and trustworthiness of the device during use. Examples: predictable or unpredictable, favor or hinder.
- **Stimulation:** The level of engagement and motivation provided by the Adaptive Stick. Example: useful or less useful, interesting or unattractive.
- **Novelty:** The novelty and innovativeness of the design and features. Example: creative or not creative, conservative or innovative.

	1	2	3	4	5	6	7		
annoying	○	○	○	○	○	○	○	enjoyable	1
not understandable	○	○	○	○	○	○	○	understandable	2
creative	○	○	○	○	○	○	○	dull	3
easy to learn	○	○	○	○	○	○	○	difficult to learn	4
valuable	○	○	○	○	○	○	○	inferior	5
boring	○	○	○	○	○	○	○	exciting	6
not interesting	○	○	○	○	○	○	○	interesting	7
unpredictable	○	○	○	○	○	○	○	predictable	8
fast	○	○	○	○	○	○	○	slow	9
inventive	○	○	○	○	○	○	○	conventional	10
obstructive	○	○	○	○	○	○	○	supportive	11
good	○	○	○	○	○	○	○	bad	12
complicated	○	○	○	○	○	○	○	easy	13
unlikable	○	○	○	○	○	○	○	pleasing	14
usual	○	○	○	○	○	○	○	leading edge	15
unpleasant	○	○	○	○	○	○	○	pleasant	16
secure	○	○	○	○	○	○	○	not secure	17
motivating	○	○	○	○	○	○	○	demotivating	18
meets expectations	○	○	○	○	○	○	○	does not meet expectations	19
inefficient	○	○	○	○	○	○	○	efficient	20
clear	○	○	○	○	○	○	○	confusing	21
impractical	○	○	○	○	○	○	○	practical	22
organized	○	○	○	○	○	○	○	cluttered	23
attractive	○	○	○	○	○	○	○	unattractive	24
friendly	○	○	○	○	○	○	○	unfriendly	25
conservative	○	○	○	○	○	○	○	innovative	26

Figure 2. UEQ Instrument

3.1.5 Result Analysis

The analysis of the UEQ questionnaire was carried out using expert UEQ Data Analysis Tools. This process generates an average score that reflects how users perceive the system. Data collected from respondents through the questionnaire was input into these tools for further analysis. The UEQ Data Analysis Tools follow multiple steps:

i. Data Transformation

The responses entered in Excel go through a conversion process. Specifically, the sequence of values where positive ratings are positioned on the right and negative on the left are shuffled within the questionnaire. This randomization helps to reduce potential response bias, as demonstrated in Figure 3.

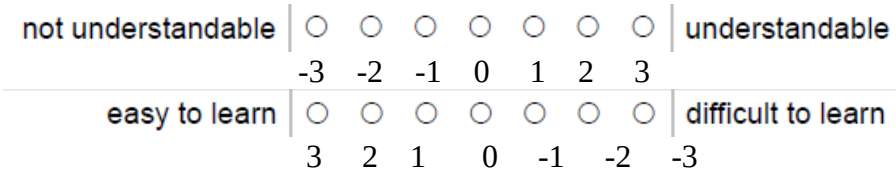

Figure 3. Data Conversion

Figure 3 illustrates the sequence used to organize values, aiming to reduce the variability in individual item responses. The transformed data generates a mean score per individual, with each category grouped according to specific criteria. Equation (1) below is the formula employed for the calculation of average values:

$$\bar{x} = \frac{\sum \bar{x}\,[\text{person}]}{\sum \text{item}} \quad (1)$$

Description:
$\bar{x}$ = Average score for an individual
$\sum \bar{x}\,[\text{person}]$ = Sum of scores across all items for a person
$\sum \text{item}$ = Total number of items measured

ii. Result Calculation of UEQ

The primary result is derived by recalculating the average data conversion. This result serves as the main benchmark for the subsequent calculations in the UEQ. Both the overall and assumption scales are determined based on the average and variance from the converted data. An intermediate scale result falls within an expected range, with -0.8 considered below average and 0.8 as a standard result. The calculation formula is stated in equation (1).

iii. Set Data Benchmark

The UEQ approach employs benchmark standards, which classify the results into five categories: Bad, Average, Below Average, Above Average, Good, and Excellent. Table 2 illustrates the specific values associated with each category.

Table 2. UEQ Data Analysis Categories

		Category				
No	Aspect	Excellent	Good	Above Average	Below Average	Bad
1	Attractiveness	>1.84	>1.58	>1.18	>0.69	<=0.69
2	Perspicuity	>2.00	>1.73	>1.2	>0.72	<=0.72
3	Efficiency	>1.88	>1.5	>1.05	>0.6	<=0.6
4	Dependability	>1.7	>1.48	>1.14	>0.78	<=0.78
5	Stimulation	>1.7	>1.35	>1.00	>0.5	<=0.5
6	Novelty	>1.6	>1.12	>0.7	>0.16	<=0.16

The categories are interpreted as follows:

Excellent: Falls within the top 10% of results.
Good: Outperforms 75% of the results, with 10% being better.
Above Average: Scores better than 50%, with 25% achieving higher.
Below Average: Performs better than 25%, with 50% higher.
Bad: Among the bottom 25% of results.

The collected data were analyzed using descriptive statistics to summarize the participants' responses. Mean scores for each UEQ dimension were calculated to assess the overall user experience. Additionally, benchmark comparisons were made to evaluate the Adaptive Stick's performance against established standards in assistive technology user experience.

3.1.6 Conclusion and Recommendations

This phase represents the final step in the research design process, focusing on gathering the study's findings and offering recommendations based on the user experience analysis. It summarizes the key results and highlights the strengths and areas for improvement identified throughout the evaluation. At this stage, specific recommendations are made to improve user experience and play an important role in guiding future developments. By presenting these ideas, this phase significantly contributes to the ongoing discussion in user experience research, which helps to shape future development.

4. Results and Discussion

Table 3 presents the frequency and percentage of demographic data and categorical responses from the participants with visual impairments.

Table 3. Frequency and Percentage of Demographic Data and Categorical Responses

Variable		**Frequency**	**Percentage (%)**
Gender	Male	2	50.0
	Female	2	50.0
Age	20-29	2	50.0
	30-39	2	50.0
Level of Visual Impairment	90-95%	1	25.0
	Complete	3	75.0

Cause of Vision Loss	Since Birth	3	75.0
	Head and Brain Injury	1	25.0
Digital Competence	High	4	100

The gender of the participant is equal with 2 males (50.0%) and 2 females (50.0%), which shows a balanced representation of genders. The study shows an equal age group, with two participants (50%) aged 20-29 representing the young adult participants and another two (50%) aged 30-39 that represent middle-aged participants. As for the level of visual impairment, the data reveals that 1 participant (25.0%) has a visual impairment of 90-95%, while 3 participants (75.0%) are classified as having a complete visual impairment. Besides, the causes of vision loss indicate that 3 individuals (75.0%) have experienced vision loss since birth, while 1 participant (25.0%) has lost vision due to head and brain injury. Furthermore, all participants (100%) reported a high level of digital competence. This shows that they are skilled in using digital technologies such as smartphones and impacts their interactions with assistive devices and technologies such as adaptive sticks. The high digital competence could influence the usability and acceptance of assistive technologies among participants.

The evaluation of the User Experience Questionnaire (UEQ) for the Adaptive Stick for Blind indicates a mostly positive user experience across various usability aspects. The analysis, which covers mean, variance, and standard deviation for 26 different items, shows that most item scores are above 1. This suggests that all question items were well-rated, reflecting a strong overall perception of the device.

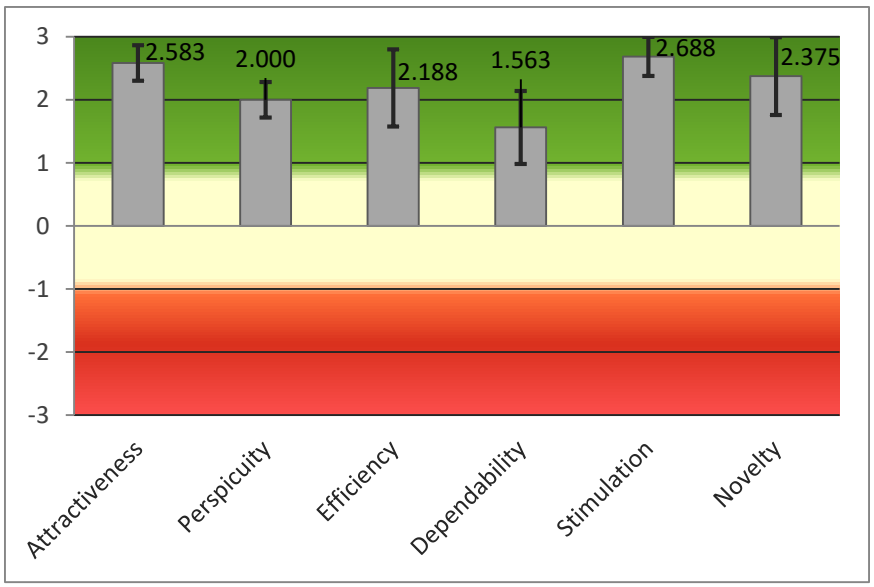

Figure 4. Average Impressions Across Six Different Scales

As shown in Figure 4, the Attractiveness score averaged 2.583, indicating that users found the Adaptive Stick to be pleasant to use. This finding is in line with Qiu, S. et al. (2023), who stressed the importance of visual appeal to improve user satisfaction with assistive technologies. The Perspicuity score of 2.000 suggests that while the system was easy to understand, some users faced issues with clarity, which is crucial for usability, especially for visually impaired individuals (Tanwar, S., & Rao, P. V. M., 2024).

The Efficiency score of 2.188 shows that users felt the Adaptive Stick helped them complete

tasks with minimal effort, which is a key factor in fostering independence among visually impaired users (Khan, A., & Khusro, S., 2021). On the other hand, the Dependability score was lower at 1.563, indicating possible concerns about the system's reliability and consistency. This matches the findings from (Uzir, M. U. H., 2021), who noted that user satisfaction is strongly connected to the reliability of assistive devices.

The highest score was seen in Stimulation, at 2.688, indicating that users felt encouraged and interested while using the device. This engagement is important to promote the regular use of assistive technologies, as highlighted by Pedersen, H., Kermit, P. S., & Söderström, S., 2021). The Novelty score of 2.375 reflects users' views of the system as new and different, though it suggests there is room for further improvement in this area.

Overall, the findings indicate a strong user experience, particularly in terms of engagement and visual appeal. However, the results also show that aspects such as reliability and clarity could be improved. The variation in user ratings, shown by the error bars, suggests that some features may need more attention to improve user satisfaction and performance. Addressing these areas will be essential for the ongoing development and acceptance of the Adaptive Stick among its users. While the Adaptive Stick demonstrates strong usability and user engagement, future updates should focus on enhancing its reliability and clarity to ensure a complete and satisfying user experience.

Table 4. User Experience Questionnaire (UEQ) Scores for UX Aspects

UEQ Scale		**UX Aspect**	**UEQ Scale Score**
Attractiveness	2.58	Attractiveness	2.583
Pragmatic Quality	1.92	Perspicuity	2.000
		Efficiency	2.188
		Dependability	1.563
Hedonic Quality	2.53	Stimulation	2.688
		Novelty	2.375

Table 4 presents the scores from the User Experience Questionnaire (UEQ) for various user experience dimensions associated with the Adaptive Stick for Blind to assist visually impaired individuals. The scores are organized into three primary quality categories which are Attractiveness, Pragmatic Quality, and Hedonic Quality. Each category represents distinct aspects of user experience. The Attractiveness category focuses on visual appeal, while Pragmatic Quality incorporates perspicuity, efficiency, and dependability. Hedonic Quality includes stimulation and novelty.

The Attractiveness score of 2.58 suggests that users find the Adaptive Stick visually appealing and engaging. This score is significant as it highlights the role of visual design in improving user satisfaction and acceptance of assistive technologies. A strong attractiveness score can enhance user engagement and contribute to a favourable overall experience (Tanwar, S., & Rao, P. V. M., 2024).

Pragmatic Quality evaluates the practical elements of user experience, which are important for the effective utilization of the device.

The perspicuity score of 2.00 indicates that users generally find the device understandable,

although some clarity issues remain. This score means that while the device is functional, there is a need for enhancements in clarity and ease of understanding to enhance user confidence and satisfaction (Pandey, M. et al., 2021).
The efficiency score of 2.188 reflects that users view the Adaptive Stick as effective to assist them with tasks while requiring minimal effort. This aspect is crucial to promote independence among visually impaired individuals, as it directly influences their ability to navigate and carry out daily activities (Khan, A., & Khusro, S., 2021).
The dependability score of 1.563 shows a moderate level of trust in the device's reliability. While users feel fairly confident in the device's performance, there is potential for improvement in this area to enhance user satisfaction and trust in the technology (Nazar, M. et al., 2021).
Hedonic Quality evaluates the emotional aspects of user experience, which are essential for user engagement and satisfaction.

Table 5. Comparative Analysis of User Experience Quality Metrics

Scale	Mean	Comparison to benchmark	Interpretation
Attractiveness	2.58	Excellent	In the range of the 10% best results
Perspicuity	2.00	Good	10% of results better, 75% of results worse
Efficiency	2.19	Excellent	In the range of the 10% best results
Dependability	1.56	Good	10% of results better, 75% of results worse
Stimulation	2.69	Excellent	In the range of the 10% best results
Novelty	2.38	Excellent	In the range of the 10% best results

The comparative analysis of user experience quality metrics for the Adaptive Stick for Blind (Table 5) highlights its strengths in usability while identifying key areas for refinement.
The device achieved an "Excellent" rating in Attractiveness (2.58), placing it in the top 10% of results, which underscores its visually appealing design a critical factor in user adoption and satisfaction, as prior research emphasizes (Torrado et al., 2020).
Perspicuity scored lower (2.00, "Good"), revealing that while most users grasped the device's functionality, those with complete visual impairment faced challenges in operational clarity. This suggests a need for more intuitive tactile or auditory feedback mechanisms to bridge the usability gap (Tanwar, S., & Rao, P. V. M., 2024). (Pandey, M. et al., 2021) highlight the importance of user-friendly design to enhance the usability of assistive devices.
"Excellent" Efficiency score (2.19) confirms the device's effectiveness in aiding navigation, though user feedback noted limitations in complex urban environments, pointing to opportunities for adaptive features like real-time terrain analysis. High efficiency is crucial for assistive devices, as it directly impacts the user's ability to perform daily activities independently and safely (Khan, A., & Khusro, S. (2021)). The results indicate that the Adaptive Stick for Blind successfully fulfills its primary goal of enhancing user mobility.
Dependability (1.56, "Good") reflects moderate user trust in reliability, indicating room for improvement in consistency, such as through fail-safe obstacle detection systems (Kim, H. N.,

2021).
Notably, the device excels in Stimulation (2.69, "Excellent"), demonstrating its ability to engage users is a key factor in long-term adoption. (Contreras-Somoza, L. M. et al., 2021).
However, the Novelty score (2.38, "Excellent"), while high, signals unmet demand for innovative features such as AI-driven contextual cues, which could further differentiate the device in the assistive technology market (Srivastava, P., & Shandilya, G., 2024)). Addressing this aspect could lead to greater user satisfaction and a more compelling product offering.
Overall, these results demonstrate the Adaptive Stick's strong foundational usability but underscore the importance of prioritizing user-centered innovations, particularly in clarity for visually impaired users, real-world adaptability, and advanced functionalities to elevate its impact. Future work should focus on iterative co-design with end-users to refine these aspects, ensuring the device not only meets but exceeds the evolving needs of its target audience.

5. Conclusion

This study aimed to evaluate the user's experience with the Adaptive Stick, a device designed for the Blind Society in Sarawak, Malaysia, by using the User Experience Questionnaire (UEQ) method. The results show how effective this assistive technology is and how satisfied users are with it.
Findings indicate that users generally have a positive view of the Adaptive Stick, especially regarding its engagement and efficiency. With an attractiveness score of 2.58 and a stimulation score of 2.69, it appears that the Adaptive Stick not only fulfills the practical needs of visually impaired users but also provides an enjoyable and motivating experience. These results are consistent with previous research that highlights the significance of user experience in developing assistive technologies.
Nonetheless, the study also revealed some areas that could be improved, particularly in clarity and reliability, which received scores of 2.00 and 1.56, respectively. While users found the Adaptive Stick fairly easy to understand, there is still room for improvement in making it clearer and more dependable. Focusing on these aspects is essential to ensure that users feel secure and in control when using the device.
This evaluation highlights the importance of involving users in the design process. By incorporating user feedback and engaging them in iterative design cycles, developers can make enhancements that better align with user needs and preferences. Future research should aim to refine the Adaptive Stick's interface and functionality based on user input to enhance its effectiveness and overall satisfaction.
Overall, the evaluation of the Adaptive Stick through the UEQ has provided a thorough understanding of its user experience. Positive feedback confirms the device's potential to enhance mobility and independence for visually impaired individuals. Continuous efforts to improve user experience through design enhancements and active user engagement will be important for the continued development of assistive technologies that effectively support this community.

Acknowledgements

The authors would like to extend their sincere gratitude to Politeknik Kuching Sarawak that have made significant contributions to various parts of this research.

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