Blended Contextual and Cultural User Testing Methodologies in Edtech

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Abstract

The role of user testing methodologies is crucial in guaranteeing the effectiveness and cultural suitability of educational technology solutions, as technology continues to have a growing impact on the educational domain. Nevertheless, the current techno-centric methodologies employed for user testing have exhibited certain constraints when it comes to comprehensively capturing the intricate user experiences and cultural contexts that are distinctively associated with educational technology (EdTech) products. This paper presents a new framework, referred to as the "Blended Cultural and Contextual User Testing Methodology for Educational Technology," which is based on the principles of Cultural-Historical Activity Theory (CHAT). This novel framework seeks to enhance the design of educational technology solutions for diverse user populations by incorporating contextual and culturally focused methodologies, thereby addressing the limitations of conventional approaches. The paper concludes by providing recommendations for the implementation of the proposed framework by educational technology (EdTech) companies in Africa. These recommendations emphasize the framework's potential to enhance learning outcomes, expand educational opportunities for marginalized communities, and facilitate positive social and economic transformations.

Keywords: Innovative teaching, user-testing, edtech, inclusive design

1. Introduction

Throughout the years, there have been numerous advancements in user testing methodologies. However, there have also been calls from various sources to enhance the cultural and contextual aspects of user testing for technology solutions. In recent years, there has been an increasing interest in incorporating cultural contexts within the realm of human-computer interaction (HCI) design. Nonetheless, a disparity persists between the exploration of models and approaches pertaining to intercultural user interface design (IUID) and their tangible utility for user interface (UI) designers [1]. In order to ensure the proper functionality of software products on a global scale, it is imperative to take into account cultural factors such as language, writing formats, and regional aspects [2]. The design process of mobile health (mHealth) interventions often neglects the incorporation of users' socio-cultural contexts, as highlighted by [3].

Research has demonstrated the ineffectiveness of techno-centric approaches that exclusively prioritize technology or depend on universal frameworks for user-centered design. Hence, it is crucial to establish a methodical methodology that encompasses the socio-cultural milieu of mHealth implementations in order to facilitate user engagement [3]. The utilization of cultural probes has been identified as a viable method for collecting contextual and cultural data from users. Cultural probes encompass user engagement through self-reporting, examination of users' individual circumstances and perspectives, and the application of exploratory approaches and resources [4]. According to Green [4], these tools have the capacity to facilitate participant self-reflection, empower participants to collect their own data, and enable research to be conducted across various locations and over extended periods of time. Nevertheless, it is imperative to acknowledge that cultural probes ought to be employed alongside other research methodologies rather than serving as a replacement for ethnographic investigation. The investigation of contextual information has been explored in the domain of speech perception among individuals with cochlear implants (CIs) [5]. According to Dingemanse and Goedegebure [5], the research demonstrated that contextual information has the potential to impact speech intelligibility. Additionally, they determined that an ecologically valid sentence test, which incorporates contextual information, is an appropriate method for evaluating speech intelligibility in individuals with cochlear implants.

Within the realm of educational technology, there is a pressing need to initiate the development of user testing methodologies that are more inclusive, with a specific emphasis on cultural and contextual considerations. The application of a techno-centric approach to user testing within the educational technology (edtech) domain has encountered various obstacles and constraints. Consequently, there is a growing recognition of the necessity to adopt a contextual and cultural perspective in user testing

methodologies. In order to overcome these limitations, it is imperative to adopt a contextual and cultural perspective when conducting user testing within the educational technology (edtech) domain. The measurement of the efficacy of educational technology tools and the assessment of user outcomes are frequently insufficiently conducted. A predominant emphasis in the field of educational technology is placed on the design aspects of digital tools, with relatively less attention given to the examination of the learning process and outcomes resulting from their utilization [6]. This emphasizes the necessity of redirecting attention towards assessing the influence of educational technology tools on educational achievements and user perceptions.

2. The Importance of Cultural and Contextual User Testing Methodologies in Edtech

In recent years, there have been notable advancements in the field of educational technology (EdTech), particularly in terms of incorporating technology into educational environments. Nevertheless, the efficacy of educational technology (EdTech) products is significantly contingent upon the methodologies employed for user testing. The limitations of techno-centric user testing methodologies, which primarily emphasize the technical aspects of a product, have been demonstrated in their inability to adequately capture the cultural and contextual factors that significantly impact user experiences. The paragraphs that follow examines several shortcomings associated with techno-centric user testing methodologies.

2.1. Technostress and Techno-Distress

The phenomenon of technostress and techno-distress is a topic of increasing interest and concern in academic and professional circles. Technostress refers to the negative psychological and physiological. According to Tarafdar et al. [7], technostress refers to the stress that individuals experience as a result of their utilization of information systems. This phenomenon plays a noteworthy role in the constraints of techno-centric user testing methodologies. The methodologies frequently neglect to account for the intricate interplay of various factors that contribute to technostress, including interruptions, multitasking, and system-related problems. Techno-distress, which is a detrimental consequence of technostress, has the potential to diminish user satisfaction and impede the efficacy of educational technology products [7]. Hence, it is imperative to employ user testing methodologies that consider the wider context in which technology is utilized.

2.2. Bias and Inequality in EdTech

The presence of bias and inequality within the field of educational technology (EdTech) is a significant concern that warrants academic attention. The integration of artificial intelligence (AI) within the field of educational technology (EdTech) has given rise to apprehensions regarding the presence of bias and inequality. Educational technology (EdTech) products frequently depend on algorithms that are constructed using historical data from the field of education. However, it is important to acknowledge that these algorithms have the potential to perpetuate preexisting biases and inequalities within the educational system. The presence of bias has the potential to disproportionately impact marginalized communities, thereby intensifying social injustices. The potential biases associated with technology may be disregarded by user testing methodologies that are primarily centered around technology functionality, neglecting the social implications of the technology. Hence, it is imperative to employ cultural and contextual methodologies in order to discern and address bias within educational technology (EdTech) products [8].

2.3. Diversity and International Collaboration

The topic of diversity and international collaboration is of significant academic interest and has garnered considerable attention in various fields of study. The exploration of diversity and international collaboration encompasses an examination of the multifaceted dimensions of diversity. In order to mitigate the constraints inherent in techno-centric user testing methodologies, it is imperative to augment the range of research methodologies employed and broaden the geographical contexts in which they are conducted. It is recommended that scholars undertake investigations into methodologies that have received limited attention and engage in partnerships with researchers from developing nations in order to cultivate a more inclusive and comprehensive comprehension of educational technology [9]. By integrating a range of viewpoints, employing cultural and contextual approaches can more effectively capture the intricacies of user experiences and promote the creation of EdTech products that are more inclusive and equitable.

2.4. Balanced Deliberation on EdTech Benefits and Risks

A comprehensive examination of the advantages and disadvantages of educational technology. The growing dependence on educational technology

(EdTech), especially in the context of the COVID-19 pandemic, calls for a comprehensive and objective examination of the advantages and disadvantages associated with technology [10]. The utilization of techno-centric user testing methodologies may result in the oversight of potential risks and adverse impacts associated with educational technology (EdTech), thereby fostering an excessively optimistic consensus. The utilization of cultural and contextual methodologies can contribute to a more comprehensive comprehension of the advantages and drawbacks, thereby facilitating well-informed decision-making within the educational sphere.

The utilization of techno-centric user testing methodologies in educational technology (EdTech) products is constrained by its inability to fully capture the cultural and contextual factors that significantly impact user experiences. Neglecting these factors can lead to the development of biased and inefficient products. In order to overcome these limitations, it is imperative to employ cultural and contextual methodologies that can guarantee the advancement of inclusive, equitable, and efficacious educational technology products. By integrating a range of perspectives, addressing and minimizing bias, and promoting international collaborations, the field of Educational Technology (EdTech) can progress towards a more inclusive and user-centric approach.

3. Techno-centric User Testing Methodologies

The methodologies employed in techno-centric user testing primarily center around the assessment and examination of the technological components inherent in a given product or service. Presented below are several instances of techno-centric user testing methodologies (see Table 1).

3.1. Cultural and Contextual User Testing Methodologies

Cultural and contextual user testing methodologies primarily aim to comprehend the impact of culture and context on user behavior, preferences, and experiences during their interactions with a given product or service. Presented below are several illustrations of user testing methodologies that are grounded in cultural and contextual considerations (see Table 2).

3.2. Selected Edtech Products and their User Testing Methodologies

All the selected companies have employed diverse user testing methodologies in order to enhance the design and functionality of their educational technology products. A/B testing and usability testing are commonly employed by edtech companies due to

their ability to facilitate the evaluation of various iterations of a product and obtain valuable insights regarding its user-friendliness.

Table 1. Techno-centric User Testing Methodologies

Methodology	Description
Usability Testing	Observing users to identify usability issues, navigation problems, and user satisfaction with the overall user interface.
Performance Testing	Assessing how well a system performs under specific conditions, such as load testing to evaluate responsiveness and stability.
Compatibility Testing	Checking how well a product or service functions across different devices, browsers, operating systems, or screen sizes.
Security Testing	Identifying vulnerabilities and weaknesses in the system to ensure user data is protected from unauthorized access and breaches.
Accessibility Testing	Assessing whether a product or service is usable by individuals with disabilities, adhering to accessibility standards like WCAG.
Automation Testing	Using automated scripts to execute test cases, speeding up testing and ensuring consistency in repetitive tasks.
Load Testing	Evaluating a system's performance under normal and peak loads to understand its capacity and potential bottlenecks.
Stress Testing	Assessing how well a product or service performs under extreme conditions, such as high user loads or limited resources.
Regression Testing	Ensuring that new updates or changes to a system do not adversely affect existing functionalities.
User Interface (UI) Testing	Evaluating the visual elements, layout, and aesthetics of the user interface to ensure it meets design guidelines and user expectations.
User Experience (UX) Testing	Focusing on understanding users' overall experience with a product or service, including emotions, perceptions, and satisfaction levels.
Cross-Browser Testing	Verifying that a product or service works consistently across different web browsers.
A/B Testing	A/B testing (also known as split testing or bucket testing) is a methodology for comparing two versions of a web page or app against each other to determine which one performs better

Table 2. Cultural and Contextual User Testing Methodologies

Methodology	Description
Contextual Enquiry	Observing users in their natural environment, such as their homes or workplaces, to understand how the product or service fits into their daily lives and routines.
Participatory Design	Actively involving users in the design process, allowing them to contribute ideas, feedback, and suggestions, to create culturally relevant and contextually appropriate solutions.
Cultural Probe	Using creative and exploratory methods, like diaries, photographs, or storytelling, to elicit user insights about cultural influences, emotions, and experiences related to the product.
Cultural Usability Testing	Considering cultural differences and preferences when assessing a product or service's usability to ensure alignment with users' cultural context.
Field Studies	Immersing researchers in users' environment and culture to gain deeper insights into their needs, challenges, and behaviors related to the product or service.
Persona Development	Creating user personas based on cultural and contextual factors to better understand the target audience's diversity and design with cultural inclusivity in mind.
Cross-Cultural Usability Testing	Testing the product or service with users from different cultural backgrounds to identify potential cultural barriers or adaptation requirements.
Multilingual Testing	Ensuring the product or service is usable and culturally appropriate for users who speak different languages.
Cultural Heuristics Evaluation	Assessing the product or service against culturally specific usability guidelines and principles.
Cultural Focus Groups	Holding focus groups with users from diverse cultural backgrounds to gain insights into cultural preferences, perceptions, and expectations.
Localization Testing	Verifying that the product or service is adapted to suit specific cultural norms, language, and regional preferences.
Emic and Etic Analysis	Emic analysis focuses on understanding users' perspectives from within their cultural framework, while etic analysis examines cultural patterns and norms from an external, objective viewpoint.

Table 3. Selected Companies and User Testing Methodologies

Company	Product	User Testing Methodology
Duolingo	Language learning app	A/B Testing, Usability Testing
Quizlet	Study aid app	A/B Testing, Usability Testing, Focus Groups
Coursera	Online learning platform	A/B Testing, Usability Testing
Kahoot!	Game-based learning platform	Usability Testing, Focus Groups
Edmodo	Learning management system	A/B Testing, Usability Testing, Surveys
Classcraft	Gamification platform	Usability Testing, Focus Groups, Surveys
Screencastify	Screen recording tool for teachers	Usability Testing, Contextual Inquiry
Flipgrid	Video discussion platform	Usability Testing, Participatory Design

In addition to the aforementioned methods, focus groups and surveys are frequently employed in order to collect user insights and gain a comprehensive

understanding of their perspectives, opinions, and experiences pertaining to a particular product. Contextual inquiry and participatory design are two methods that are not frequently utilized but hold significant value in assisting developers in acquiring a more profound comprehension of the context and requirements of their users (see Table 3).

4. Theoretical Framework - Cultural-Historical Activity Theory (CHAT)

This study is theoretically grounded on the Cultural-historical activity theory (CHAT). CHAT is a theoretical framework that originated from the work of Lev Vygotsky and his colleagues. It emphasizes the dialectical relationship between individual and collective activity, and the role of cultural and historical factors in shaping human development and behavior [11], [12]. One of the key features of CHAT is its focus on the concept of activity as the unit of analysis. Activity is seen as a complex, dynamic system that involves the interaction between individuals, tools, and the social and cultural context in which it takes place [13], [14]. This perspective highlights the importance of understanding the socio-cultural and historical context in which activities occur, as well as the mediating role of tools and artifacts in shaping human behavior [11] (see Figure 1):
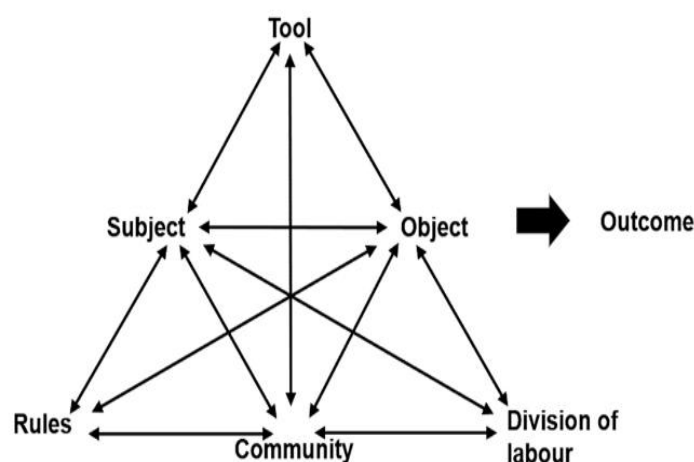

Figure 1. in Shaping Human Behavior

CHAT has been applied in various fields, including education, ergonomics, human factors, and industrial-organizational psychology [11]. In the field of education, CHAT has been recognized as a valuable framework for studying educational change and addressing the limitations of existing research approaches. It offers a more comprehensive and holistic perspective that takes into account the contextual factors, power dynamics, emotions, and identity that influence educational practices [15]. Furthermore, CHAT provides a framework for understanding the self within a social and relational view. It emphasizes the interplay between individual agency and the collective social practices in which individuals participate. The concept of the self as a leading activity highlights the active role of individuals in shaping their own development and contributing to meaningful change in the world [12]. However, it is important to note that there are different interpretations and variations of CHAT. Some scholars have divergent views on certain aspects of the theory, and there have been debates about it is boundaries and relationship with other theoretical frameworks [11]. Nonetheless, CHAT continues to be a valuable framework for understanding human activity, development, and social change, and it offers a rich theoretical basis for research in various disciplines. CHAT helps in justifying the new framework proposed in this study for user testing which combines contextual enquiry, participatory design, cultural probe and A/B testing as cultural and contextual user testing methodologies.

5. Proposed Blended Contextual and Cultural Focused User Testing Methodologies for Edtechs

Blending contextual enquiry, participatory design, cultural probe, and A/B testing as cultural and contextual user testing methodologies offers a comprehensive approach to understanding user behaviors, preferences, and experiences within their cultural and contextual settings (see Figure 2).
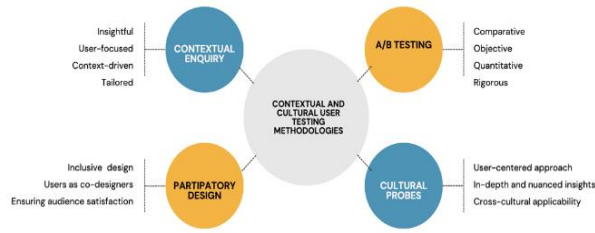
Figure 2. Blended Con-cul User Testing Framework by Co-creation Hub

Each methodology brings unique benefits to the testing process, contributing to a holistic understanding of the target audience and ensuring the design of user-centric solutions. Below is an explanation and justification for this blended approach (see Table 4).

Table 4. Methodology Blending Justifications

Highlight	Justification
Cultural Relevance	By blending these methodologies, the testing process becomes more culturally relevant and sensitive. Researchers gain a deep appreciation of cultural influences on user behaviors and preferences, allowing for the creation of culturally appropriate designs.
User-Centric Design	Involving users in the design process and utilizing their feedback from contextual enquiry, cultural probe, and participatory design ensures that the final product reflects their needs and values. It fosters a user-centric approach that prioritizes cultural inclusivity and improves overall user satisfaction.
Rich Qualitative Insights	The blend of contextual enquiry and cultural probe provides rich qualitative data that helps researchers understand the underlying cultural contexts and user motivations. This in-depth understanding contributes to more nuanced and contextually tailored design decisions.
Data-Driven Optimization	By incorporating A/B testing, the design process becomes data-driven, validating design choices based on user feedback. This iterative approach ensures that the final product aligns with users' cultural preferences and performs optimally in diverse contexts.
Ethical and Inclusive Design	A blended cultural and contextual user testing approach fosters ethical design practices by considering cultural sensitivities and avoiding biases. It also promotes inclusive design that accommodates diverse user needs and ensures that no cultural group is excluded.

- Contextual Enquiry: Contextual enquiry involves observing users in their natural environment, allowing researchers to witness how the product or service fits into their daily lives. This method helps identify context-specific needs, pain points, and usage patterns, providing a rich understanding of how cultural context influences user interactions. The in-context observations offer valuable insights that may not be apparent in a controlled testing environment.

- Participatory Design: Participatory design emphasizes involving users as active collaborators in the design process. This approach acknowledges that users are experts in their own experiences and cultural norms. By engaging users in the design process, we tap into their cultural knowledge, preferences, and creative input, resulting in culturally relevant solutions that better meet their needs.

- Cultural Probe: Cultural probe employs creative methods like diaries, photographs, or storytelling to gain deep insights into users' cultural influences, emotions, and experiences related to the product or service. This qualitative approach unveils users' subjective perspectives and cultural nuances that quantitative testing alone cannot capture. It enables designers to empathize with users' cultural background, enhancing the cultural appropriateness of the final design.

- A/B Testing: A/B testing involves presenting users with different design variations and comparing their responses to optimize the final product. When incorporated as part of cultural and contextual user testing, A/B testing helps to validate design choices while considering cultural preferences and contextual requirements. It enables designers to fine-tune the product to better resonate with diverse cultural audiences.

6. Justification for the New Proposed Framework using CHAT

Using Cultural-Historical Activity Theory (CHAT) to justify the new user testing methodology that combines contextual enquiry, participatory design, cultural probe, and A/B testing involves understanding how CHAT views human activity as a socially and culturally embedded process. Below are the justifications (see Table 5).

Table 5. Using Cultural-Historical Activity Theory

Area	Justification
Cultural and Contextual Perspective	Cultural-Historical Activity Theory recognizes that human activities are shaped by cultural and contextual factors. By combining various user testing methodologies like contextual enquiry, participatory design, cultural probe, and A/B testing, we can gain a holistic understanding of how users interact with a product or service within their specific cultural and contextual settings. This approach allows us to identify cultural nuances, user preferences, and context-specific requirements that influence user behavior.
Participatory Design and Contextual Enquiry	Incorporating participatory design and contextual enquiry in the user testing methodology aligns with CHAT's emphasis on involving users in the design process and understanding their activities within the real-world context. Engaging users as active participants allows us to capture valuable insights, co-create solutions, and ensure that the testing process reflects the users' actual needs and experiences.
Cultural Probe	Cultural Probe, as part of the user testing approach, helps reveal users' subjective experiences, emotions, and cultural influences that might not be evident through traditional testing methods. This aspect complements CHAT's focus on understanding the subjective nature of human activity and the influence of culture on user interactions.
A/B Testing	Integrating A/B testing enables us to assess the impact of design variations and cultural-specific elements on user behavior and preferences. By analyzing the data from A/B tests within a cultural-historical framework, we can identify patterns, trends, and preferences unique to specific user groups or cultural contexts, leading to more informed design decisions.
Activity Systems Analysis	CHAT emphasizes analyzing activity systems to understand the dynamic relationship between users, tools, and the broader cultural context. By combining multiple user testing methodologies, we can develop a more comprehensive view of the activity system, identify potential conflicts or contradictions, and optimize the design to better align with the users' cultural and contextual requirements.

7. Implication of the Framework for Edtech Companies in Africa

The utilization of user testing methodologies, including contextual inquiry, cultural probes, participatory design, and A/B testing, holds considerable implications for the development and enhancement of educational technology (edtech) solutions in Africa. These methodologies enable the creation of edtech solutions that are specifically tailored to the unique requirements, preferences, and circumstances of African learners and educators. The utilization of contextual inquiry can facilitate startups in acquiring a more profound comprehension of users' requirements and operational processes within distinct cultural and educational settings. Cultural probes have the potential to offer valuable insights into the cultural values and practices that could potentially influence user interactions with educational technology solutions. The implementation of participatory design methodologies can effectively facilitate the co-creation of solutions with users, thereby ensuring their relevance and alignment with their specific needs. Ultimately, A/B testing can serve as a valuable tool in determining the optimal iteration of an educational technology solution tailored to a particular demographic. By integrating these user testing methodologies into their development process, educational technology startups in Africa have the potential to develop solutions that are more efficient, user-centric, and tailored to the specific requirements of African learners and educators. Consequently, this can contribute to the enhancement of the adoption and efficacy of educational technology solutions within the given geographic area.

Context-based user testing offers numerous benefits for edtech startups, particularly those operating within diverse cultural and educational landscapes in Africa. There are five notable advantages associated with context-based user testing:

i. Provides valuable insights: Context-based user testing, such as contextual inquiry, enables edtech startups to gain a deeper understanding of their target users, their needs, and the context in which they operate. This understanding can provide valuable insights that can inform the design of effective solutions.

ii. Increases relevance: By designing solutions that are tailored to the specific needs and workflows of their target users, edtech startups can increase the relevance of their solutions. This can lead to higher adoption rates and better engagement from users.

iii. Improves usability: Context-based user testing can help edtech startups identify usability issues and pain points that may not have been apparent otherwise. This information can be used to refine and improve the design of solutions, making them easier and more intuitive for users to use.

iv. Reduces development costs: By testing solutions with users early in the development process, edtech startups can identify and address issues before they become costly to fix. This can help to reduce development costs and ensure that solutions are delivered on time and within budget.

v. Increases impact: By designing solutions that are tailored to the needs of their target users and that address specific pain points, edtech startups can increase the impact of their solutions. This can lead to improved learning outcomes and increased access to education for underserved communities, ultimately contributing to positive social and economic change.

8. Usage Flow for each of the Blended Methodologies

This section outlines the step-by-step process for implementing each of the blended methodologies. This flow provides a structured guide, showing how each stage integrates cultural and contextual considerations, as well as how various user testing tools and techniques are applied in practice. By following these usage flows, practitioners can ensure that their methodologies are not only technically sound but also responsive to the nuanced needs and experiences of diverse user groups. Each approach is tailored to optimize both user engagement and data accuracy, creating a balanced framework that enhances the overall efficacy of user testing in EdTech.

8.1. Contextual Inquiry Methodology

Edtech companies in Africa can use contextual inquiry user testing methodology to drive the quality of their product for contextual understanding of their products by following these steps (see Figure 3):
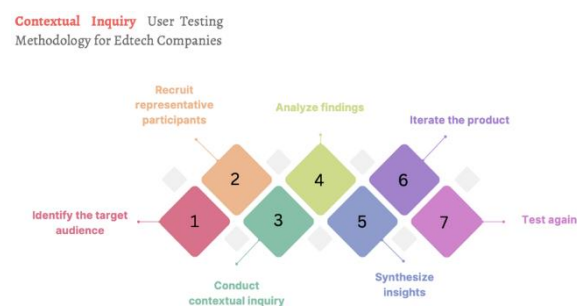

Figure 3. Contextual Inquiry

i. Identify the target audience: Determine who the

end-users of the product are, including their cultural background, educational level, and technological literacy.

ii. Recruit representative participants: Recruit a diverse group of participants who match the characteristics of the target audience.

iii. Conduct contextual inquiry: Observe the participants in their natural environment as they interact with the product. Ask questions to understand their thought process, decision-making, and context.

iv. Analyze findings: Identify patterns and themes that emerge from the data collected during the contextual inquiry.

v. Synthesize insights: Synthesize the findings to generate insights into how the product can be improved to better meet the needs of the target audience.

vi. Iterate the product: Use the insights gained to iterate the product, improving its design and functionality to better meet the needs of the target audience.

vii. Test again: Test the product with a new set of participants to ensure that the improvements made have effectively addressed the identified issues.

8.2. Cultural Probe

Edtech companies in Africa can use cultural probe user testing methodology to drive the quality of their product for cultural expectations and alignments of their products by following these steps (see Figure 4):

i. Define the research goals: Edtech companies should identify what they want to learn about their users' cultural background.

ii. Select the participants: The company should select participants who reflect the target user demographic and culture.
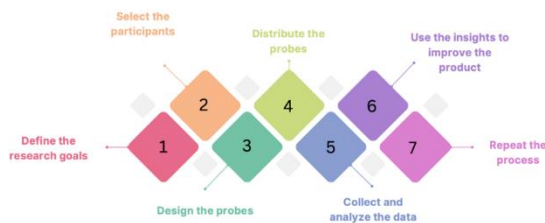

Figure 4. Cultural Probe

iii. Design the probes: The company should design culturally sensitive probes, which can include open-

ended questions, drawings, and multimedia prompts, to gather data on user behavior and preferences.

iv. Distribute the probes: The company should distribute the probes to the participants, along with clear instructions for completing them.

v. Collect and analyze the data: The company should collect the probes and analyze the data to gain insights into the users' cultural and contextual background.

vi. Use the insights to improve the product: The company should use the insights gained from the cultural probe testing to make improvements to their product, such as adapting the language used in the interface, providing more culturally relevant content, or adjusting the user experience to better match the cultural preferences of the users.

vii. Repeat the process: Edtech companies should conduct cultural probe testing regularly to ensure that their product remains relevant and responsive to the cultural and contextual needs of their users.

8.3. Participatory User Design

Edtech companies in Africa can use participatory user testing methodology to drive the quality of their product for cultural and contextual understanding of their products by following these steps (see Figure 5):

i. Identify target users: The first step is to identify the target users and understand their cultural and contextual backgrounds. This will help the company to design a user testing plan that is tailored to the specific needs and preferences of the target audience.

ii. Recruit participants: The next step is to recruit participants who are representative of the target audience. The company can use various methods such as social media, email, or local community organizations to recruit participants.

iii. Develop testing materials: The company should develop testing materials that are culturally and contextually appropriate for the target audience. This may involve translating materials into local languages or using visuals that are familiar to the target audience.
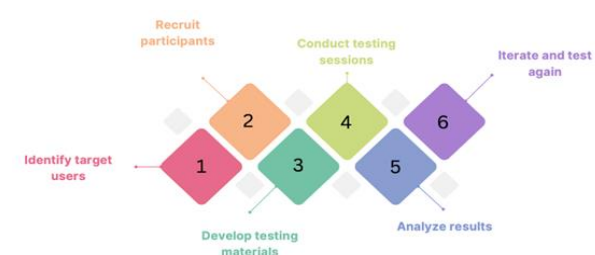

Figure 5. Participatory Design

iv. Conduct testing sessions: The company should conduct testing sessions with the recruited participants. These sessions should be designed to collect feedback on the usability and effectiveness of the product, as well as cultural and contextual appropriateness.

v. Analyze results: The company should analyze the results of the user testing sessions to identify areas for improvement. This may involve making changes to the product design or user interface to better meet the needs of the target audience.

vi. Iterate and test again: The company should iterate and test the product again based on the feedback received from the first round of user testing. This process should be repeated until the product is deemed culturally and contextually appropriate for the target audience.

8.4. A/B Testing

Edtech companies in Africa can use A/B user testing methodology to drive the quality of their product for cultural and contextual understanding of their products by following these steps (see Figure 6):
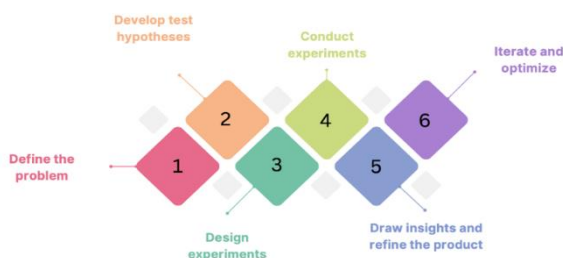

Figure 6. A/B Testing

i. Define the problem: Identify the problem or challenge that the company wants to address through A/B testing. This could be related to user experience, product functionality, or other areas.

ii. Develop test hypotheses: Based on the problem identified, develop test hypotheses to be tested through A/B testing. For example, a hypothesis could be that users in a particular region would prefer a certain type of user interface.

iii. Design experiments: Design A/B experiments to test the hypotheses developed. The experiments should be designed in a way that enables the company to collect meaningful data on user behavior and preferences.

iv. Conduct experiments: Conduct the A/B experiments, collect data, and analyze the results to determine which variant performs better.

v. Draw insights and refine the product: Based on the results of the A/B experiments, draw insights and refine the product to better meet the cultural and contextual needs of users in the target market.

vi. Iterate and optimize: Continuously iterate and optimize the product based on user feedback and ongoing A/B testing to ensure that it continues to meet the needs of users in the target market.

9. Conclusion

In conclusion, advancing user testing methodologies within educational technology (EdTech) necessitates an inclusive approach that thoroughly addresses cultural and contextual factors. Traditional techno-centric approaches, while valuable for technical evaluations, often fall short of capturing the complex interplay between technology use, user engagement, and socio-cultural dynamics. By integrating culturally sensitive frameworks and leveraging tools like cultural probes alongside other research methods, user testing can better reflect real-world use scenarios, enhancing the relevance and effectiveness of EdTech solutions. This approach will not only improve user satisfaction but also support more meaningful learning outcomes, ultimately contributing to the global usability and impact of educational technologies.

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