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Interactive Digital Flipbooks: Enhancing Engagement and Accessibility in Education for Diverse Learners in Technology in ELT Course at Universitas Negeri Medan

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Abstract

Digital tools have become increasingly popular in enhancing student engagement and accessibility, particularly in the context of English Language Teaching (ELT). This study explores the effectiveness of Heyzine digital flipbooks in improving engagement and accessibility for diverse learners in the Technology in ELT course at Universitas Negeri Medan. Using a descriptive qualitative approach, data were collected through classroom observations, lecturer interviews, focus group discussions (FGDs), surveys, and questionnaires. The findings show that digital flipbooks significantly enhance student engagement, with multimedia elements like videos, animations, and quizzes catering to different learning styles. Accessibility features, such difficulties accessing content in digital flipbooks and accessibility in mind for students with different needs, were particularly beneficial for students with learning disabilities. However, technical challenges such as slow loading times and navigation difficulties were noted, alongside concerns regarding accessibility design for students with visual, auditory, and learning disabilities. Despite these issues, 75% of students reported never feeling disengaged, and 95% of students found the interactive features most engaging. The study concludes that while digital flipbooks have great potential to foster engagement and improve learning outcomes, ongoing improvements in usability and accessibility are necessary to fully support diverse learners.

Keywords: digital flipbooks, student engagement, multimedia learning, Technology in ELT, diverse learners

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Introduction

In recent years, the integration of technology into educational practices has significantly transformed teaching and learning experiences across the globe. Technological advances, mobility, and communication have become essential components of education in the twenty-first century, emphasizing the need for creative and innovative instructional approaches (Santia & Nurmayani, 2023;Arisandhi et al., 2023). Effective learning facilitation now requires educators to incorporate technology into their teaching processes, as it enhances learning outcomes and supports personalized instruction (Arisandhi et al., 2023); (Dooly & Sadler, 2020). However, many classrooms, particularly in English Language Teaching (ELT), still struggle with challenges such as inadequate teaching materials and subpar learning technologies, which can exacerbate poor learning outcomes (Rizky & Widihastrini, 2018). Additionally, achieving an optimal learning environment requires addressing student competencies and providing adequate tools to support accessibility and engagement (Dooly & Sadler, 2020).

To address these challenges, the use of advanced learning media is critical in engaging students and improving their educational experiences (Satria et al., 2023). Among the innovative digital tools gaining traction are interactive digital flipbooks, which incorporate multimedia elements like videos, quizzes, and animations to create dynamic and engaging learning environments (Satria et al., 2023) Flipbooks cater to diverse learner needs by supporting visual, auditory, and kinesthetic learning styles, while also offering flexible content exploration through both passive and active modes of engagement, similar to the Rich Interactive Narrative

framework (Takeda et al., 2013). For example, Heyzine Flipbook allows readers to explore content at their own pace, increasing both engagement and enjoyment (Takeda et al., 2013) The integration of multimedia components such as videos, audio, and graphics in flipbooks mirrors the strategies used in engaging educational courses, which have been shown to boost user satisfaction and engagement (Jerardi et al., 2013)

Despite these benefits, challenges persist in fully implementing digital tools in ELT. For instance, while visual learners may prefer diagrams and charts, auditory learners benefit more from verbal instructions or audio-based interactions ((Lugo et al., 2019; Kharisma et al., 2024)). Moreover, studies reveal that even visual learners may sometimes favor text-based materials, underscoring the multidimensional nature of learner preferences and its impact on system design (Lugo et al., 2019). Additionally, some learners still prefer traditional methods, such as paper handouts, highlighting the importance of offering diverse learning options to meet varying preferences and levels of technological access (Tomkins & Wallis, 2023). Addressing these needs requires personalized, accessible, and inclusive tools to foster effective learning experiences.

At Universitas Negeri Medan, the integration of technology in ELT courses has become a focal point, with teachers receiving extensive technology training and mentorship to facilitate successful implementation (Satria et al., 2023). This study explores the potential of interactive digital flipbooks, particularly Heyzine Flipbook, as tools to bridge gaps in engagement and accessibility in ELT. These digital tools provide students with the flexibility to traverse content nonlinearly, increasing engagement and fostering a more inclusive learning environment (Takeda et al., 2013). By addressing the varying learning styles and needs of students, including those with disabilities, this research seeks to provide practical insights into integrating digital flipbooks into ELT curricula. Through this exploration, the study contributes to the broader discussions on inclusive, technology-driven teaching practices in higher education, particularly in non-Western educational contexts such as Indonesia.

Method

This study applied a descriptive qualitative research design to examine how interactive digital flipbooks can improve engagement and accessibility in education for diverse learners. A qualitative approach is ideal for understanding the experiences of both lecturers and students, allowing for detailed insights into their use of digital flipbooks. During the implementation phase, the developed medium was tested in real classrooms to ensure its practical application aligns with the study's goals (Satria et al., 2023). Participants were selected through purposeful sampling from different educational environments, ensuring a range of perspectives. The effectiveness of the flipbook materials was assessed using classroom observations, semi-structured interviews, and focus groups, which provided valuable data on how these tools impact learning engagement and accessibility (Satria et al., 2023). By using this approach, the study focused on capturing real-life interactions and the contextual nuances of implementing flipbooks in education, as suggested by prior research emphasizing qualitative methods in educational innovation (Davidson, 2009); (Youhasan et al., 2022).

The population for this study consists of lecturers and students who actively engage with interactive digital flipbooks in various educational settings. Participants were selected purposefully to ensure diversity, representing different age groups, educational backgrounds, and learning needs. Questionnaires were used to examine the flipbooks' format, content, and language compatibility, ensuring their suitability for a broad spectrum of learners (Wibowo et al., 2019). This diversity enables a comprehensive understanding of how digital flipbooks impact engagement and accessibility across different learner profiles. The sample size was determined by data saturation, focusing on obtaining rich, in-depth insights until no new themes emerged. This approach is consistent with qualitative research practices and ensures the validity of findings in complex, real-world contexts (López-Belmonte et al., 2022); (Zhu & Yang, 2023).

The study gathered data through a combination of semi-structured interviews, focus groups, classroom observations, and questionnaires. Semi-structured interviews provided in-depth insights into individual experiences, allowing lecturers and students to share their perspectives on the use of digital flipbooks. Focus group discussions captured collective experiences and group dynamics, while classroom observations documented real-time interactions and challenges related to engagement and accessibility. Additionally, questionnaires were used to evaluate the format, content, and language compatibility of the flipbooks, offering a structured method for gathering participant feedback (Wibowo et al., 2019). This multi-method approach ensured a well-rounded analysis, enabling cross-verification of data from different sources to identify recurring themes and patterns in the study.

Results and Discussion

The results from this study show that Heyzine digital flipbooks had a positive impact on student engagement and accessibility in the Technology in ELT course at Universitas Negeri Medan. Most students found the interactive features—such as videos, quizzes, and animations—helpful in keeping them interested and engaged in lessons. Additionally, students with learning needs benefited from the flipbook's accessibility tools, like text-to-speech and adjustable font sizes. However, there were some challenges, such as slow loading times and navigation issues, which were reported by both students and lecturers. In the following discussion, we will look at these results in more detail, compare them to existing research, and explore how digital flipbooks can be improved for better use in Technology in ELT classroom.

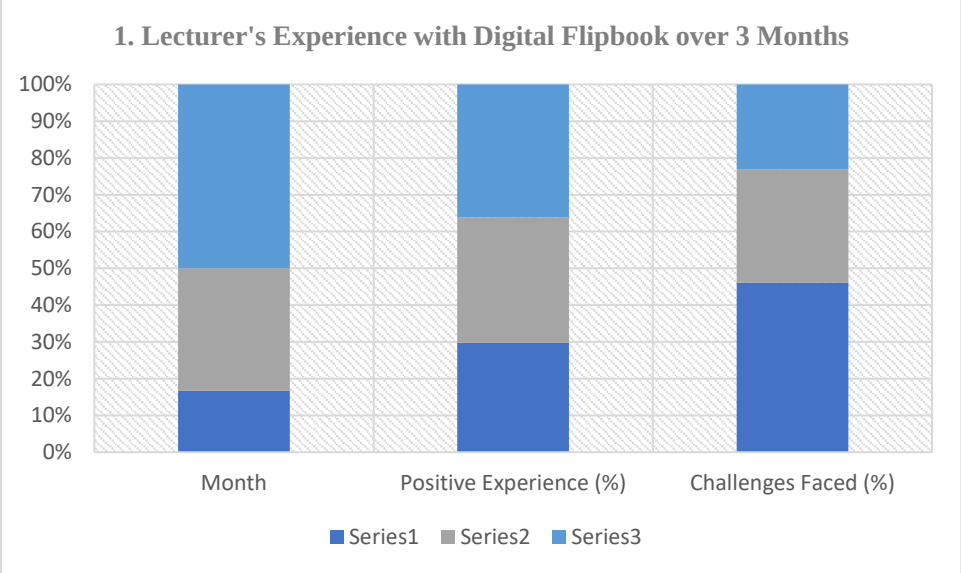

Figure 1. *Lecturer's Experience with Digital Flipbook over 3 Months*

The data on the lecturer's experience with digital flipbooks over a three-month period reveals a marked improvement in their use and effectiveness. In the first month, 70% of the lecturer's experience was positive, while 30% involved challenges. By the second month, the proportion of positive experiences increased to 80%, with challenges dropping to 20%. In the third month, the lecturer reported an even higher level of satisfaction, with 85% of the experience being positive and only 15% attributed to challenges. This upward trend suggests that the lecturer became increasingly proficient in using digital flipbooks over time, with the technical and logistical difficulties being progressively resolved. The data indicates that, with continued use, the lecturer was able to refine their approach and better integrate digital flipbooks into their teaching, ultimately improving the overall effectiveness of these tools.

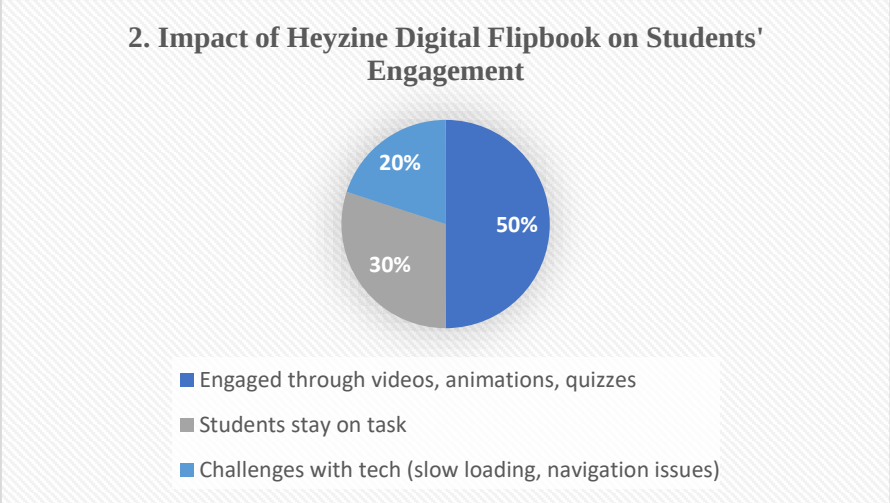

Figure 2. *Impact of Heyzine Digital Flipbook on Students' Engagement*

The data concerning the impact of Heyzine digital flipbooks on student engagement demonstrates largely positive outcomes, though some challenges remain. A notable 50% of students reported high engagement with the multimedia features, such as videos, animations, and quizzes, which significantly aided in capturing their attention and enhancing their overall learning experience. Additionally, 30% of students indicated that they were able to stay on task while using the digital flipbooks, further emphasizing the tool's effectiveness in fostering focused and purposeful learning. However, 20% of students encountered technical difficulties, including slow loading times and navigation problems, which detracted from their experience. These issues underscore the importance of continuous technical support and further platform optimization to ensure seamless interaction with the digital content. In conclusion, while the digital flipbooks were largely successful in promoting student engagement, addressing the technical challenges would likely improve the learning experience and reduce potential disruptions.

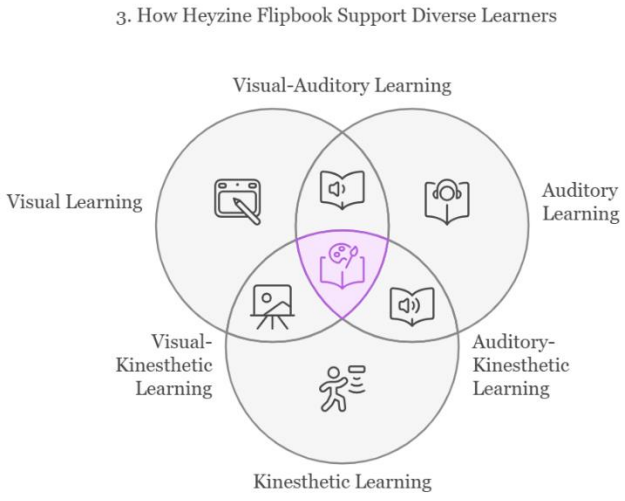

Figure 3. *How Heyzine Flipbook Support Diverse Learners*

The data concerning the support provided by Heyzine flipbooks to diverse learners underscores the tool's effectiveness in accommodating various learning preferences. Visual learners benefit substantially from the integration of multimedia elements such as images, videos, and infographics, which significantly enhance both their engagement and understanding of the material. Auditory learners are similarly supported through the inclusion of audio narrations, offering an additional modality of content delivery that facilitates more effective information

processing via listening. For kinesthetic learners, the interactive quizzes and activities embedded in the flipbooks are crucial in promoting active participation, enabling students to engage with the content in a hands-on manner. By addressing the distinct needs of visual, auditory, and kinesthetic learners, Heyzine digital flipbooks foster a more inclusive and adaptable learning environment, thereby enhancing engagement and comprehension for all students.

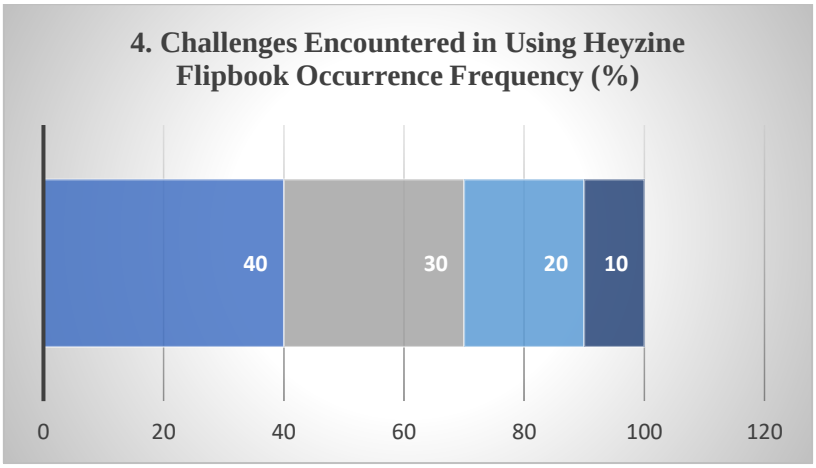

Figure 4. *Challenges Encountered in Using Heyzine Flipbook Occurrence Frequency*

The data regarding challenges encountered in using Heyzine digital flipbooks highlights several significant obstacles faced by both instructors and students. Technical issues emerged as the most commonly reported challenge, affecting 40% of users, and included problems such as slow loading times and unresponsive features, which notably hindered the overall user experience. Navigation difficulties were reported by 30% of respondents, suggesting that certain users, particularly those less familiar with digital tools, found the interface and usability of the flipbooks challenging. Furthermore, 20% of participants expressed a preference for traditional teaching methods, indicating some resistance or difficulty in adapting to digital learning technologies. Lastly, accessibility issues, which affected 10% of users, were primarily associated with students with special needs, who faced barriers in accessing certain flipbook features. Despite these challenges, the data suggests that the successful integration of digital flipbooks in education is achievable through targeted improvements in technology, user support, and enhanced accessibility features.

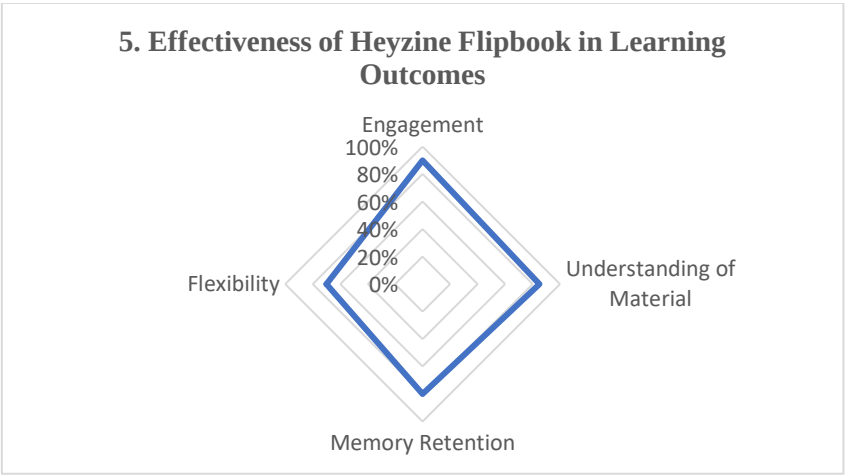

Figure 5. *Effectiveness of Heyzine Flipbook in Learning Outcomes*

The data indicates that Heyzine digital flipbooks significantly enhance learning outcomes. Notably, **student engagement** emerged as the most prominent benefit, with 90% of participants reporting that the flipbooks' interactive features—such as videos, quizzes, and animations—effectively sustained their attention. This heightened engagement, in turn, contributed to a notable improvement in **material comprehension**, with 85% of students indicating a stronger grasp of the content. Furthermore, **memory retention** showed considerable improvement, as 80% of students found it easier to recall the material, likely due to the multimedia and interactive elements. Although slightly less pronounced, **flexibility** was still positively rated by 70% of students, who valued the ability to learn at their own pace. Collectively, these findings underscore the efficacy of Heyzine flipbooks in fostering enhanced engagement, comprehension, retention, and overall learning flexibility.

Focus Group Discussion

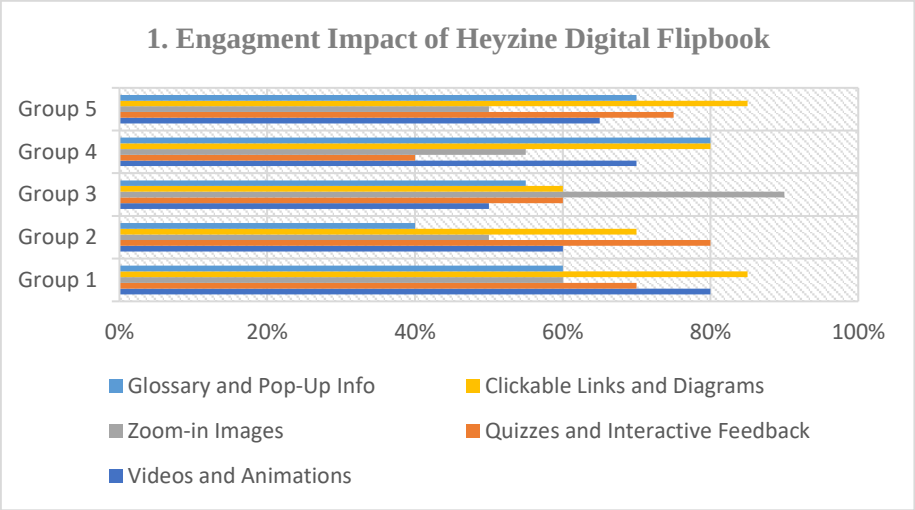

Figure 6. Engagement Impact of Heyzine Flipbook

The data reveals varying levels of engagement with the features of Heyzine digital flipbooks across five focus groups. Clickable links and diagrams emerged as the most engaging elements, with Groups 1 and 5 showing the highest engagement at 85%, followed by Group 4 at 80%. This highlights the effectiveness of interactive features, such as links and diagrams, in maintaining student engagement. Videos and animations also garnered considerable interest, particularly in Group 1 (80%) and Group 4 (70%), although their impact was less pronounced in Group 3 (50%). Quizzes and interactive feedback demonstrated a moderate level of engagement, with Groups 2 (80%) and 5 (75%) exhibiting stronger involvement, while Group 4 reported the lowest engagement at 40%. The zoom-in images feature proved particularly effective for Group 3 (90%), suggesting its value for students requiring more detailed visual content. Finally, the glossary and pop-up information feature was most engaging for Groups 4 (80%) and 5 (70%), indicating that supplementary explanations aid in content comprehension. In summary, while features such as clickable links and videos were generally effective across all groups, certain elements like quizzes and zoom-in images had a more targeted impact, aligning with the distinct learning preferences of specific groups.

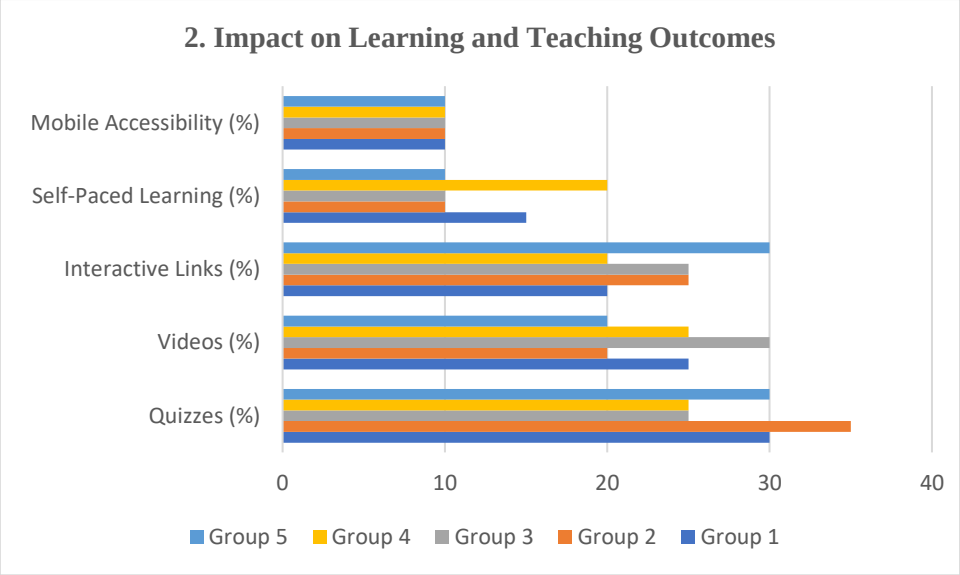

Figure 7. Impact on Learning and Teaching Outcomes

The data regarding the impact of Heyzine digital flipbooks on learning and teaching outcomes reveals varying preferences among the five focus groups. Quizzes emerged as the most valued feature, with Group 2 (35%) and Group 1 (30%) emphasizing their role in reinforcing learning. Videos were also considered significant, particularly by Group 3 (30%) and Group 1 (25%), who found them helpful in enhancing understanding. Interactive links proved most beneficial for Group 5 (30%) and Group 2 (25%), as they facilitated access to supplementary content. In contrast, self-paced learning was less prioritized, with Group 4 (20%) highlighting its importance, though it remained a secondary feature overall. Mobile accessibility had a minimal impact on learning outcomes, with all groups reporting low engagement (10%), suggesting that while it offers convenience, it does not substantially influence the learning process. These findings underscore the centrality of quizzes and interactive links in improving learning outcomes, while indicating that mobile accessibility and self-paced learning had a comparatively smaller effect.

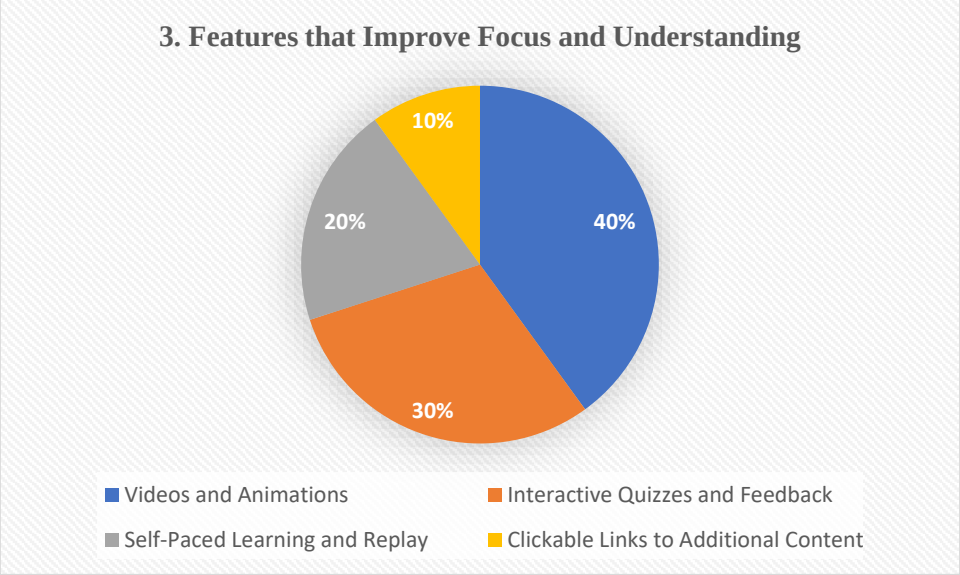

Figure 8. Features that Improve Focus and Understanding

The data indicates that videos and animations are the most effective features for maintaining student focus and enhancing comprehension, with 40% of respondents identifying these

multimedia elements as pivotal. These interactive features appear to effectively capture attention and make the learning process more engaging. Interactive quizzes and feedback were also deemed significant by 30% of participants, highlighting their role in reinforcing learning and enabling immediate self-assessment. In contrast, self-paced learning and the ability to replay content were less influential, with only 20% of respondents recognizing their value, suggesting that while flexibility is beneficial, it does not engage students to the same extent as other features. Finally, clickable links to additional content were considered the least impactful, with only 10% of respondents emphasizing their contribution to enhancing focus and understanding. This suggests that, while supplementary content is useful, it is not as central to the learning experience as videos, animations, and quizzes.

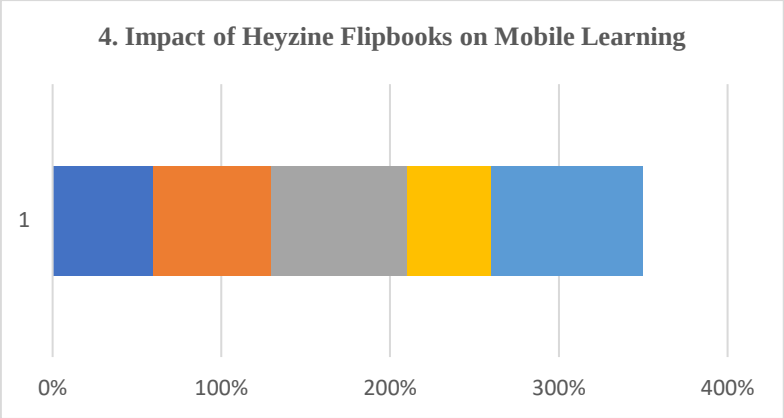

Figure 9. Impact of Heyzine Flipbooks on Mobioe Learning

The data reveals a generally positive, though varied, impact of Heyzine digital flipbooks on mobile learning across different focus groups. Group 5 reported the strongest benefit, with 90% of participants acknowledging the significant value of mobile accessibility, highlighting its effectiveness for learning on the go. Group 3 also indicated substantial positive effects, with 80% recognizing the contribution of mobile access to their learning experience. Group 2 showed a similarly strong response, with 70% of participants emphasizing the importance of mobile learning. In contrast, Group 1 and Group 4 reported more moderate benefits, at 60% and 50%, respectively, suggesting that while mobile access was advantageous, its impact was somewhat less pronounced in these groups. This disparity may be influenced by factors such as familiarity with technology, availability of suitable devices, or individual learning preferences. Nevertheless, the data clearly indicates that mobile accessibility is an important feature that significantly enhances the learning outcomes for the majority of students using Heyzine flipbooks.

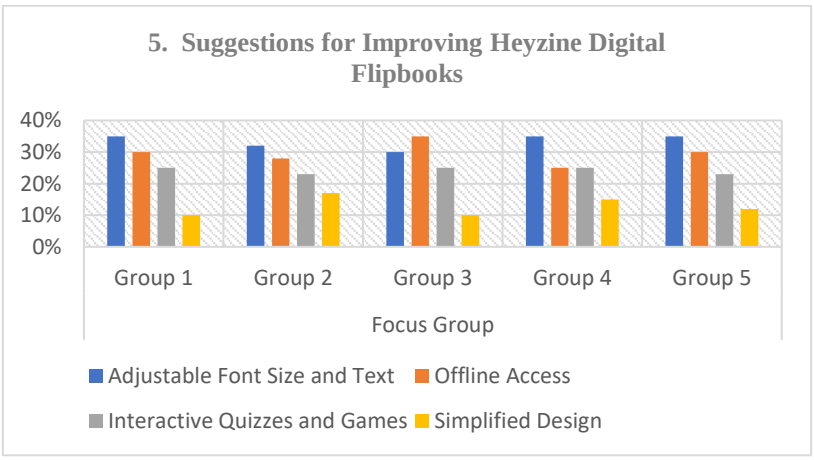

Figure 10. Suggestion for Improving Heyzine Digital Flipbooks

The data indicates a predominantly positive, yet diverse, impact of Heyzine digital flipbooks on mobile learning across the various focus groups. Group 5 demonstrated the most pronounced benefit, with 90% of participants acknowledging the substantial value of mobile accessibility, particularly for facilitating learning in flexible and dynamic environments. Group 3 also reported considerable positive effects, with 80% recognizing the role of mobile access in enhancing their learning experience. Group 2 followed closely, with 70% of participants highlighting the importance of mobile learning. In contrast, Groups 1 and 4 observed more moderate benefits, with 60% and 50% respectively, suggesting that while mobile accessibility provided advantages, its impact was less significant for these groups. This variation may be attributed to factors such as technological familiarity, device availability, or individual learning preferences. Nonetheless, the data unequivocally demonstrates that mobile accessibility is a key feature that considerably contributes to the learning outcomes of the majority of students utilizing Heyzine flipbooks.

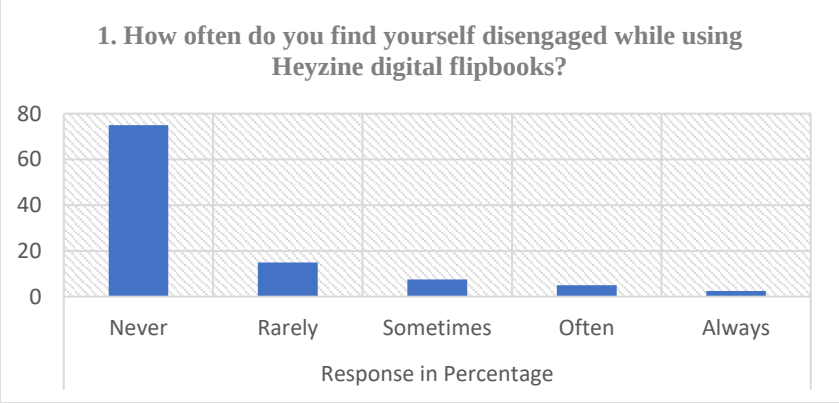

Figure 11. *Students' Engagement Challenges*

The survey findings reveal a strong level of student engagement with Heyzine digital flipbooks. A significant 75% of respondents reported never experiencing disengagement, indicating that these digital flipbooks are highly effective in maintaining students' attention throughout lessons. A smaller proportion (15%) noted that they rarely disengaged, while even fewer (7.5%) mentioned occasional disengagement. Only a small minority of students (5%) reported frequent disengagement, and just 2.5% stated they were consistently disengaged. These results suggest that, overall, Heyzine digital flipbooks are particularly successful in sustaining student engagement, with only a minimal number of students experiencing substantial disengagement. The findings underscore the potential of interactive digital tools to significantly enhance the learning experience and maintain student interest in academic content.

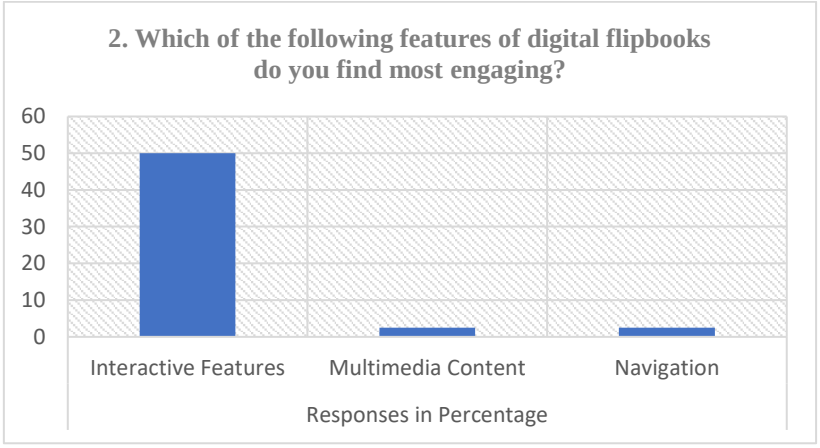

Figure 12. *Students' Engagement Challenges 2*

The survey results reveal that interactive features were regarded as the most engaging aspect of digital flipbooks by the majority of respondents (50%), underscoring their pivotal role in capturing students' attention. In contrast, multimedia elements such as videos and audio, as well as navigation, were considered less engaging, with only 2.5% of respondents highlighting these features as the most compelling. This disparity suggests that while multimedia content and ease of navigation are essential components of digital flipbooks, they may not exert the same level of impact on engagement as interactive features. The prominence of interactive elements in fostering engagement points to a preference for active, participatory learning experiences that enable students to directly engage with the content. Such features appear to be more effective in maintaining attention and promoting deeper learning engagement. These findings highlight the critical importance of prioritizing interactive elements in the design of digital learning tools to optimize student involvement and enhance educational outcomes.

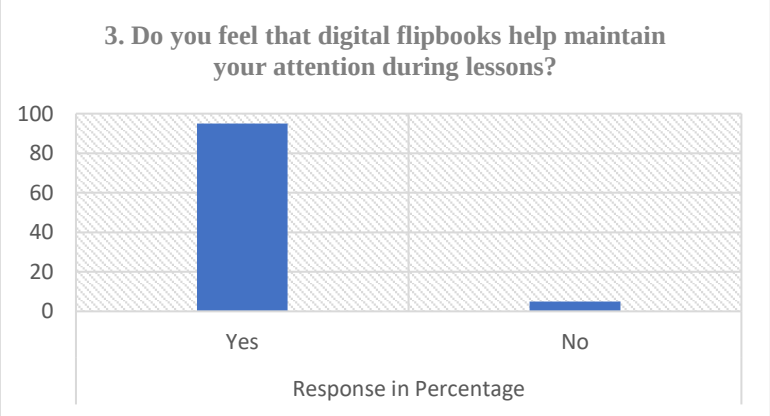

Figure 13. *Students' Engagement Challenges 3*

The survey findings underscore the significant effectiveness of digital flipbooks in maintaining student engagement throughout lessons. An overwhelming 95% of participants reported that digital flipbooks were instrumental in sustaining their focus, primarily through the integration of interactive and multimedia elements. This substantial proportion highlights the critical role of dynamic content—such as animations, videos, and interactive quizzes—in capturing students' attention, marking a clear distinction from traditional textbooks. Only 5% of respondents expressed disagreement, suggesting that while digital flipbooks are broadly valued for their ability to enhance engagement, individual preferences or specific challenges may influence their overall effectiveness. These results underscore the potential of digital flipbooks to serve as a powerful tool for fostering continuous student engagement in contemporary educational environments.

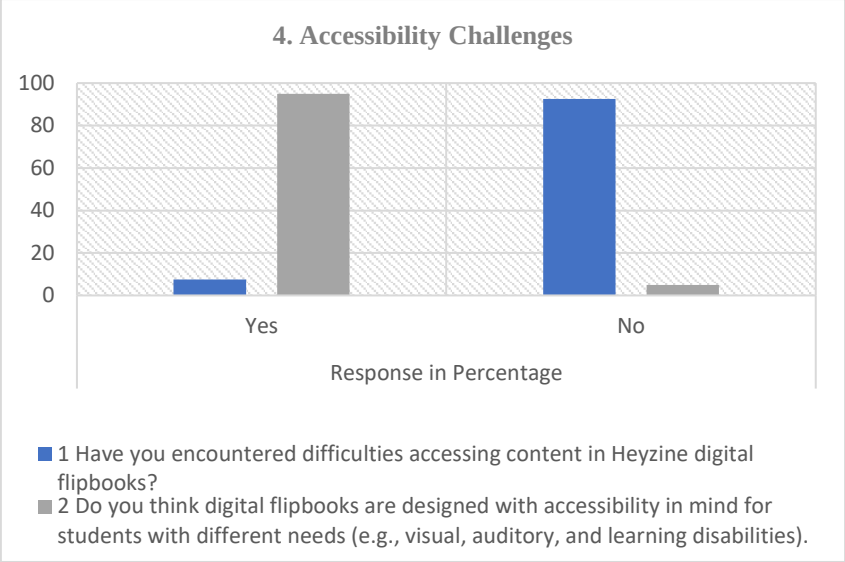

Figure 14. *Students' Accessibility Challenges*

The survey results indicate that accessibility remains a prominent issue in the use of Heyzine digital flipbooks. While a substantial 92.5% of respondents reported no difficulties in accessing the content, a notable 7.5% of participants encountered challenges, suggesting that, despite the platform's overall accessibility, certain users face barriers that impede their experience. Furthermore, when questioned about the flipbook's design in terms of supporting students with diverse learning needs—such as those with visual, auditory, or cognitive disabilities—an overwhelming 95% of respondents expressed the view that the flipbooks were inadequately designed to meet these requirements. This underscores a significant area in need of improvement, as ensuring accessibility is vital for the inclusivity and equity of digital educational tools. Addressing these accessibility challenges would not only improve user experience but also enhance the effectiveness of digital flipbooks in catering to a broader spectrum of learners.

Discussion

The evaluation results affirm the effectiveness of interactive digital flipbooks in enhancing teaching and learning experiences. Teachers demonstrated a significant improvement in their understanding of interactive teaching strategies, supported by intensive training that developed their technological skills during the flipbook implementation process (Satria et al., 2023). Such professional development opportunities align with findings by (Bledsoe & Pilgrim, 2016), who highlight the importance of social networking platforms for creating collaborative spaces that foster innovation and skill development among educators.

The ability of flipbooks to engage students through multimedia elements, including text, animations, and videos, is particularly beneficial for addressing diverse learning styles. Research by (Mohd et al., 2019) emphasizes that visual, auditory, and kinesthetic learning tools are effective in enhancing material comprehension, particularly for students with different learning preferences. Similarly, (Chen et al., 2015) support the role of adaptive systems that cater to varied learning styles, demonstrating how personalized content delivery can optimize educational outcomes.

Interactive digital flipbooks significantly increase students' enthusiasm and participation in educational activities (Arisandhi et al., 2023). The integration of visual and auditory components supports comprehension and retention, as highlighted by (Santia & Nurmayani, 2023). Moreover, studies like those by (Kassim & Nordin, 2024) reveal the efficacy of such tools in engaging students with special needs, indicating the potential of digital flipbooks to create inclusive learning environments.

In addition to fostering engagement, flipbooks improve students' cognitive outcomes by supporting self-directed and active learning. For example, (Wen et al., 2022) found that electronic books facilitate self-directed learning among medical technologists, promoting deeper understanding and better knowledge retention. Similarly, Heyzine flipbooks, through features like quizzes and interactive diagrams, provide students with opportunities to test their knowledge and reinforce concepts (Donlon et al., 2020).

While digital flipbooks offer numerous advantages, technical issues remain a notable barrier. Slow loading times, navigation difficulties, and limited accessibility for students with special needs were reported as challenges by approximately 40% of users. Research on mobile learning platform designs highlights that addressing usability issues, such as intuitive navigation and quick load times, can improve user experiences and engagement (Zhu & Yang, 2023). For students with disabilities, specialized tools and designs, as described by (Kassim & Nordin, 2024), can make digital learning environments more accessible.

The potential of Heyzine flipbooks extends beyond classroom teaching. These tools can be integrated into social networking sites to promote professional development and collaborative content creation among educators (Bledsoe & Pilgrim, 2016). As seen in other studies, collaborative directories of educational tools can encourage participation and engagement by fostering innovation and community-building (Donlon et al., 2020). Moreover, the adaptability of flipbooks to different contexts, such as healthcare education (Youhasan et al., 2022) underscores their versatility and broad applicability.

Conclusion

To conclude, the findings of this study underscore the significant potential of Heyzine digital flipbooks in enhancing educational experiences across a range of learning outcomes. The gradual improvement in lecturers' experiences over a three-month period indicates that, with continued use, the tool can become an increasingly effective teaching aid. The positive impact on student engagement, particularly through interactive multimedia features such as videos, animations, and quizzes, highlights the tool's effectiveness in maintaining attention and fostering active learning. Furthermore, the adaptability of the flipbooks in supporting diverse learning preferences—visual, auditory, and kinesthetic—demonstrates their ability to cater to a wide array of students, making the learning environment more inclusive and engaging.

However, the study also identifies several areas for improvement, particularly regarding technical issues, navigation difficulties, and accessibility challenges. While the majority of users reported positive experiences, a notable proportion encountered difficulties that hindered their overall engagement. Addressing these technical barriers and enhancing accessibility for students with diverse needs will be crucial in ensuring that the platform is fully inclusive and equitable.

The findings also suggest that while mobile accessibility is valued by many students, its impact on learning outcomes is less pronounced compared to interactive features such as quizzes and videos. Therefore, prioritizing the enhancement of interactive elements and optimizing the platform's performance should be key areas for future development.

In summary, Heyzine digital flipbooks demonstrate considerable promise as a tool for improving learning outcomes, but their full potential can only be realized by addressing the identified challenges and refining the platform's features to meet the needs of all users.

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