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THE IMPACT OF ANIMATION ON E-LEARNING APPLICATION USER ENGAGEMENT IN UI/UX DESIGN

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Abstract:
The use of animated visuals to enhance the learner experience is referred to as animation in e-learning applications. Animation can be used to explain complex concepts, make learning more interactive, and improve user comprehension. A good animation can visually capture the user's attention. For example, animated page entries or element transitions can make users focus more on the content, as well as improve the aesthetics of the application, making it look more professional and attractive. In the ever-evolving app design landscape, user engagement has become an important metric for evaluating the success of an app. This research explores the impact of animation on user engagement in web user interface/user experience (UI/UX) design. Animation is well-known as a design element, but its impact on user engagement remains unexplored. Through user testing and analysis of websites with and without animation, this research seeks to provide insight into how animation affects user behavior and interaction.

Keywords: animation, application, e-learning

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INTRODUCTION

In the ever-evolving digital age, e-learning has become one of the most appropriate and effective methods of education (Agustina, 2013). The use of technology in learning has opened the door for various innovations, including the use of animation (Nengsi & Payakumbuh, 2015). As a powerful visualization tool, animation has great potential to enhance the learning experience in e-learning applications. Animation has the ability to illustrate difficult concepts in a way that is easy to understand, resulting in better comprehension (Hapsari & Hanif, 2019; Zotov et al., 2021). This is especially important in online learning, where face-to-face interaction between instructors and students is limited (Nugroho, 2012). In addition, animation can increase student engagement, making learning more interesting and fun (Antasena et al., 2022).

Research on the use of animation in e-learning applications is still growing. In this review, we will explore the role of animation in enhancing the effectiveness of online learning, analyze different animation techniques used in this context, and evaluate their impact on achieving learning objectives. The purpose of this review is to provide an in-depth understanding of the potential of animation to enhance the learning experience in online learning environments.

Therefore, we hope this research can provide valuable guidance to e-learning application developers, instructors, and researchers in their efforts to use animation as an effective learning tool in the ever-changing and evolving digital age.

METHOD

The type of research used is experimental research, which aims to determine cause and effect and to understand the relationship between variables. This research is designed to test hypotheses or answer research questions using a systematic, controlled, experimental approach. In an experimental study, the researcher manipulates one or more independent variables (the factors to be tested, specifically the type and level of animation in the e-learning application) to see their effect on the dependent variable (the observed or measured outcome, specifically user engagement, user satisfaction, and material comprehension) according to the research population includes users of online learning applications. The data collection methods used included distributing questionnaires to measure user engagement and measuring their level of knowledge on the topic. We divided the groups into one group focusing on e-learning apps with animation during the research period and another group focusing on e-learning apps without animation as the control group. During the research period, data will be collected periodically, including questionnaire responses.

RESULT AND DISCUSSION

The research analyzes the data obtained by using data collection and experimental research methods. We find out the opinions of several e-learning application users on the application of animation to their learning process. We divided groups to examine the difference between e-learning application users who apply animation and those who do not apply animation. We collected data about the increase of e-learning application users in some countries, for example, Denmark, which is the country with the best education (according to NJ MEB survey results in 2023).

More than 90% of students in Denmark use digital devices (computers, notebooks) to study at least once a week, compared to EU averages of 52% and 59% (Weathersbee & Treen, 2003). Then, in Indonesia, there are several e-learning applications that are so popular, such as Ruang Guru, Quipper, and Zenius (Windy, 2021; Madya, 2021). The reason is because they use interesting animation elements in the online learning process so that it is interesting and makes students not easily bored when learning. We collect Statistical data such as the increase in users every month in 2020.

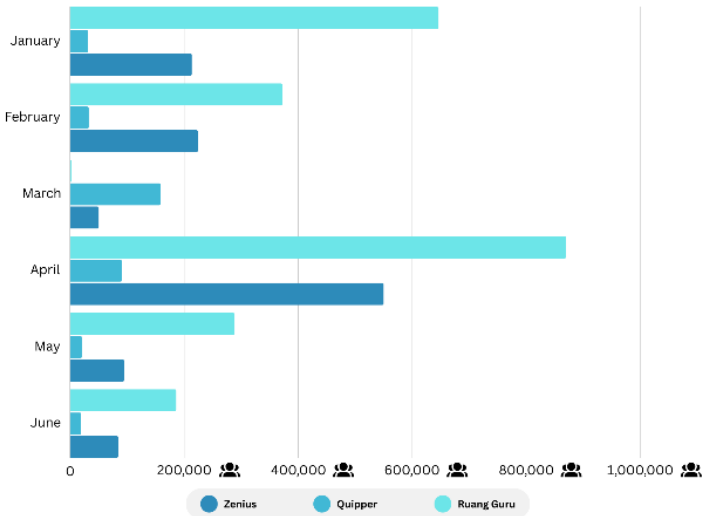

Figure 1. User Download Data Every Month in 2020
Source: (Panjaitan, Shidiq, Pratiwi, & Yokhebed, 2021)

To determine the development and effectiveness of the use of animation in e-learning applications, this research requires data on statistics on the number of all student participants in Indonesia obtained from the Kemdikbud Republic of Indonesia.

Table 1. Student data for the 2022-2023 school year

Education Level	Students data for the 2022-2023 school year
Elementary School	24.08 million
Junior High School	10.06 million
Senior High School	5.016.558 million
Vocation High School	3.061.550 million

Source: (Mustajab, 2023)

The table above shows the number of learners in Indonesia, which is 44.19 million students. The use of e-learning applications in Indonesia has also begun to develop due to the use of animation in the example application, as in Figure 1. The Ruang Guru application is seen by many users because it has interesting animations, so it is much liked by students because they feel interesting animations as well as good features that make them feel at home learning (Kristanto et al., 2020; Toruan Asmara, & Zulkarnain, 2022).

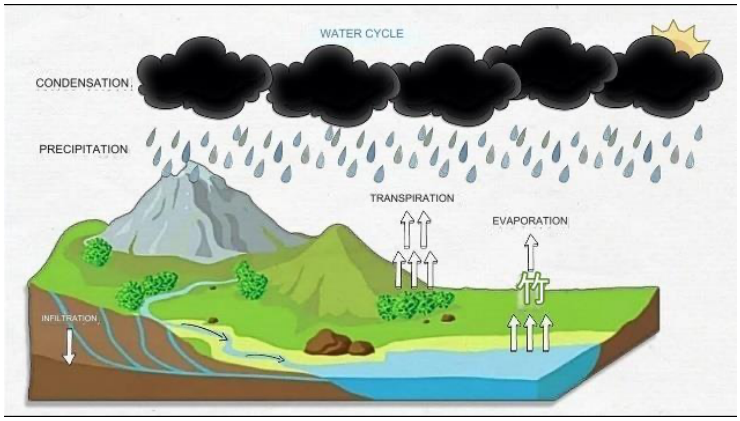

Figure 2. The Rain Circulation Process

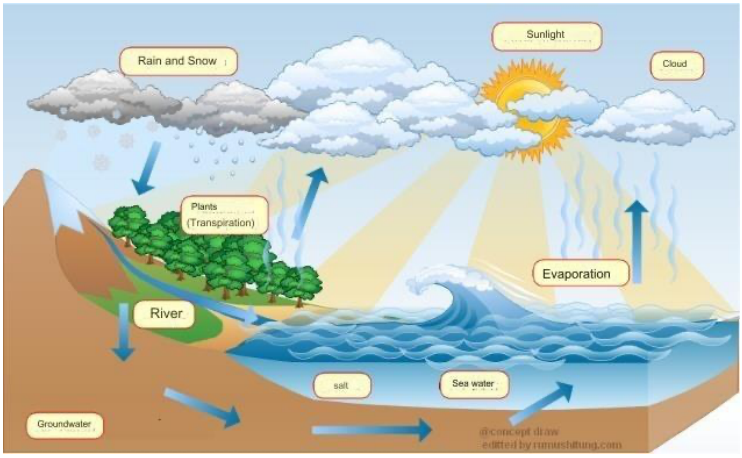

Figure 3. The Rain Circulation Processusing full animation

See Figure 2. and Figure 3. Both illustrate the rain cycle process, but in Figure 3, the information is more complete, and when animated, the rain cycle process is shown from the evaporation of water to its fall in the form of rain. Users can directly see the process at work, as opposed to just seeing pictures without clear examples.

Figure 4. Feedback on physics quizzes

The presence of animation provides the user with an enjoyable learning experience through feedback; for example, when the user completes a quiz or task, an animation can appear to inform them of their success or failure. Proper use of animation can motivate users to achieve learning goals by providing animated rewards or visual recognition.

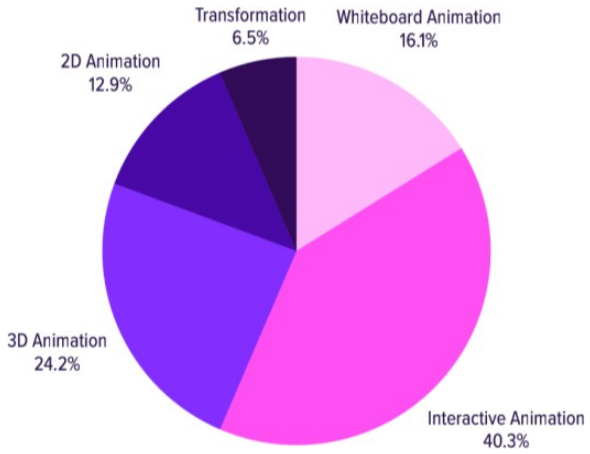

Figure 5. The results of the questionnaire on the impact of animation

After looking at the results of the questionnaire on the impact of animation on user engagement of e-learning applications in UI/UX design, we found various differences in interest in types of animation depending on the individual. There are those who prefer the use of 2D animation, which uses a series of statistical images/frames that are different from each other. There are those who like 3D animation because this type of animation creates the illusion of moving objects rendered from 3D wireframes (Nikolaev, 2023).

There are also those who are more interested in transformation animation because it represents changes without movement, such as color transformations or changes in line density. Interactive animation and whiteboard animation, which shows the process of creating a creative storyboard by drawing on a white background and recording the artwork on video. Most of them prefer interactive animation because this type can increase interaction between users and learning materials (Liu & Elms, 2019).

CONCLUSION

Animation in UI/UX design can have a positive impact on users by helping them better understand the material, making navigation more intuitive, providing clear feedback, and making the application more visually appealing. Most learners prefer animation in e-learning applications, but the use of animation should be judicious and relevant to the learning objectives, as excessive or inappropriate animation can distract users. Therefore, when implementing animation in e-learning UI/UX design, it is necessary to carefully consider user needs and learning objectives.

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