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Design Elements of Augmented Reality (ZapWorks Workshop)

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Abstract

This study highlighted augmented reality (AR) design elements utilising the ZapWorks website's AR platform. The fundamental design elements for beginners to get the idea and learn further about augmented reality design. The goal of this research is to raise awareness among educators and students about current technological trends through this ZapWorks workshop. Since it is National Training Week (NTW) events scheduled by the Human Resource Development Corporation (HRD Corp) and a sub-topic of my PhD dissertation. The research approach included qualitative analysis with a sample of six respondents from Southern University College in Johor Bahru, which includes instructors and students. NVivo instruments were utilised in this investigation to examine codes and nodes such as acceptable, engaging for the future, and simple and easy. The findings demonstrate five essential design elements featured in the ZapWorks Designer platform, including text, buttons, images, video, and 3D models. The results of this AR workshop will instruct educators and design students on how to construct interactive AR that engages with real-world environments in educational institutions. Furthermore, Malaysian educational institutions have begun to incorporate modern technology into educators' lesson plans (Course Learning Outcome, CLO).

Keywords: Design Elements, Augmented Reality (AR), ZapWorks, Educators and Students.

Introduction

This study stressed the basic design elements provided in the ZapWorks platform, especially for beginners with no experience creating AR projects. This workshop specifically utilised ZapWorks because no applications, no downloads, and no scripting are required owing to the drag-and-drop user interface of ZapWorks Designer, which makes it incredibly easy for beginners with outstanding WebAR activities.

Today's modern students, Salmee and Abd Majid (2022) are the product of a generation that grew up alongside the advancement of ICT and the internet. According to Abdullah and Jamil (2021a), Mobile Augmented Reality (MAR) is growing in popularity and is rapidly becoming an ongoing phenomenon. The ever-increasing investment in augmented reality and virtual reality is continuing to grow at a rapid pace.

Statistics (2017), the amount of augmented and virtual reality (AR/VR) costs globally in 2017 was broken down into six categories, including personal or consumer services, separate manufacturing, process manufacturing (including healthcare), retail, consumer, and others. Overall, consumer expenditure accounted for most of the global spending in 2017, accounting for US $6.2 billion, followed by others ($3.7 billion) and process manufacturing (US $0.7 billion), which was about the same volume as individual and household services (US $0.8 billion).

Literature Review

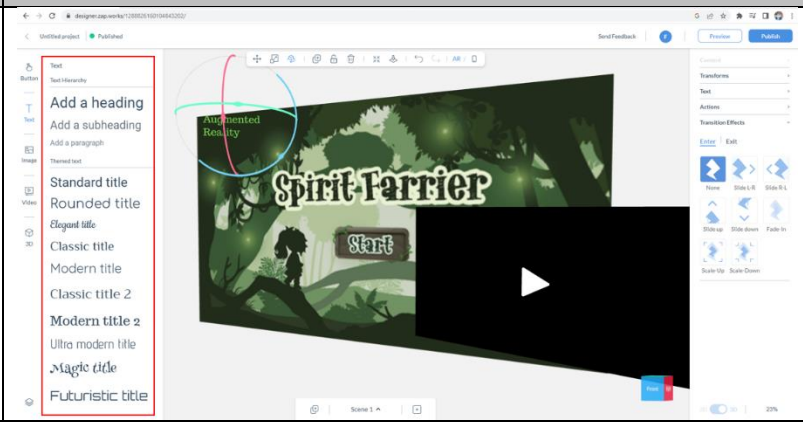
The term "augmented reality," or "AR," refers to one of the up-and-coming technologies that enables real-time interaction as well as the coexistence of physical objects and computer-generated ones (Omolafe et al., 2021).

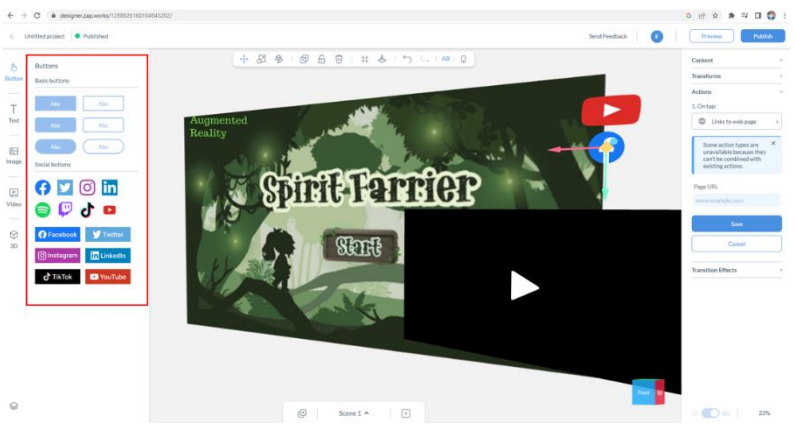
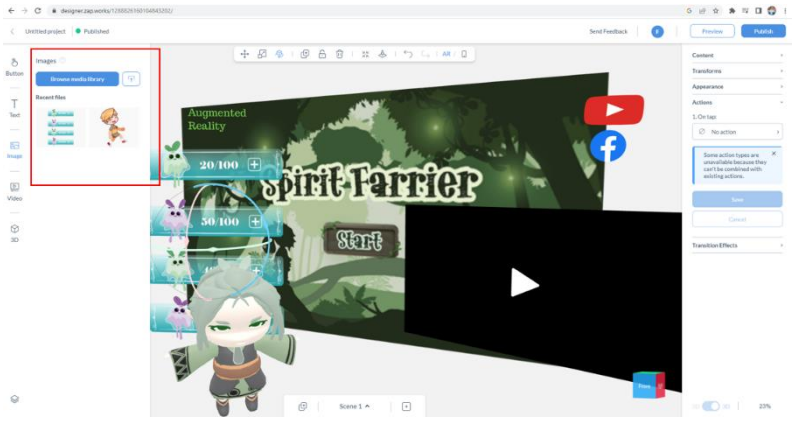
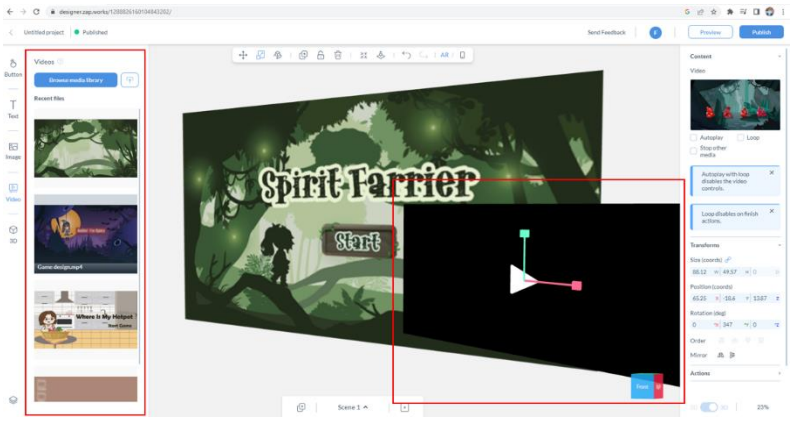
According to Abdullah and Jamil (2021c), the potential for growth of the augmented and virtual reality industry in Malaysia, as well as the aspects in which this sector is impacted by other industries such as internet access and mobile devices.

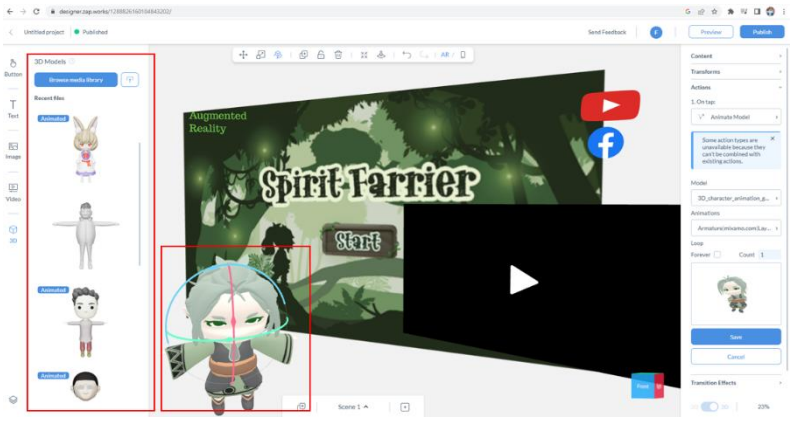
Following of current MQA Programme Standard for Art and Design highlighted students or users can interact with both the virtual and real worlds in real time owing to a technology called augmented reality, which is at the leading edge of technological development. The classrooms and instructional materials have been enhanced with augmented reality and virtual reality headset consoles.

Students who had a particular educational concern were excited to utilise augmented reality technology because they found it appealing, and the general findings of the study demonstrated that the technology was successful in assisting the learning of these students. Additionally, the students found that the technology was interesting (Turan and Atila, 2021).

Table 1
Basic Design Elements in the ZapWorks Platform

No.	Elements and Descriptions	ZapWorks Interface
1	**Text (Typography)** that serves both for sending a message and providing information in detail.	

2	**Buttons with Hyperlinks** The buttons on a multimedia design may contain hyperlinks that take the user to other websites or hypermedia, such as YouTube, Facebook, Instagram, or TikTok, amongst others.	
3	**Images or Pictures** The designs may be imported straight from Adobe Illustrator, Photoshop, or one of the other design tools. This ZapWorks application can support a wide variety of file types, if it is able to export files as JPEG or PNG images with high resolution.	
4	**Video** The responders have access to Adobe Premiere, After Effects, and several other video editing applications and can edit video straight from those programmes. If it's possible to save the file as an MP4 with an adequate resolution.	

5	**3D Models** Most respondents used Maya software, which requires them to download an additional plug-in. 3D models supported only a limited number of file types, including GLTF and GLB formats. While users of Blender can directly export and drag files into ZapWorks, users of 3Ds Max cannot do so with this augmented reality development tool.	

The table above shows 5 important elements in the ZapWorks platform, such as text (typography), buttons with hyperlinks, images, videos, and 3D models with animation. This feature can simply move your Graphical User Interface (GUI) around by dragging and dropping. From traditional two-dimensional design to advanced interactive augmented reality.

Previous researcher findings specific to MAR games list out 12 basic design elements. According to Abdullah and Jamil (2021c), 12 basic design elements were clarified, particularly for creating MAR games, such as 2D, 3D, 2D, and 3D animation, text (typography), haptic feedback, images or pictures, video, recording, audio or sound, voice commands, and interactive maps (GPS location).

There is no need to implement all these elements. The important part they need to have basic knowledge of 2D and 3D design elements. This statement aligns with Abdullah and Jamil (2021b) stated the task of designing games for mobile augmented reality is a difficult one, and investigation is required from every aspect in order to provide an experience that is entertaining and intriguing for the player.

Qualitative Data Analysis (NVivo)

The research methodology utilised qualitative analysis with a sample of six respondents from Southern University College in Johor Bahru, which includes instructors and students. According to Assarroudi et al (2018) mentioned for qualitative researchers looking for a method that is trustworthy, open, and comprehensive, the qualitative content analysis approach suggested in this study is a solid option.

NVivo instruments were operated in this investigation to examine codes and nodes such as acceptable, engaging for the future, and simple and easy. According to Smyth (2006), The topic of computer-assisted data management using an instrument like NVivo demonstrates how these technologies may be productively deployed in constructivist approaches to help the researcher with the enormous quantity of qualitative research data.

This workshop focuses on the fundamentals of augmented reality (AR) design that are compatible with beginners, including text (typography), buttons with hyperlinks, photographs or pictures, videos, and a variety of other features. Utilised two basic tracking such as image tracking and world tracking.

Zappar's best-available image tracking allows users to layer multimedia data over physical objects, printed materials, and packaging. Now supporting surfaces with bends for a more realistic experience when tracking content to containers like cans, mugs, and bottles as well.

World Tracking such as an avatars that are ready for the metaverse and immersive games like Pokémon Go that take place in real life.

Acceptable

All respondents gave good responses and were acceptable towards ZapWorks tools to create their first augmented reality design.

Respondent 1: *"I trust my instructor to follow her ZapWorks workshop tutorial" (Acceptable, 24/5/2023)*

Respondent 2: *"Yes, I am interested, and this AR website looks easy to understand." (Acceptable, 24/5/2023)*

Respondent 3: *"I believe this ZapWorks workshop can assist me to explore more about augmented reality." (Acceptable, 24/5/2023)*

Respondent 4: *"I can accept this platform to teach in my design class." (Acceptable, 24/5/2023)*

Respondent 5: *"I am interested to implement AR in my Advertising course." (Acceptable, 24/5/2023)*

Respondent 6: *"Yes, I believe ZapWorks tool is appropriate for Art & Design courses." (Acceptable, 24/5/2023)*

Interesting for future usage

Respondents 1, 2, and 6 contributed positive replies that they would like to explore more in the future, and this is an interesting AR platform to keep implementing in Art and Design courses. According to Kysela et al (2015) stated one of the most recent technological advancements, augmented reality (AR), provides fresh concepts for teaching that are both efficient and enjoyable.

Respondent 1: *"I am interested to keep explore what others advance services design elements in this ZapWorks." (Interesting for future, 24/5/2023)*

Respondent 2: *"I will continue use this ZapWorks for my final project design because it is suitable with my game design project." (Interesting for future, 24/5/2023)*

Respondent 6: *"AR is relevant to use for time to time and yes I will keep continuing this AR tool." (Interesting for future, 24/5/2023)*

Simple and Easy

Most of the respondents had an encouraging awareness of the simple and easy-to-use drag and drop features in the ZapWorks tool.

Respondent 1: *"ZapWorks workshop shows us without coding knowledge we can simply develop AR design." (Simple and Easy, 24/5/2023)*

Respondent 3: *"For beginners like us it easy to understand the design elements in ZapWorks." (Simple and Easy, 24/5/2023)*

Respondent 4: *"As educators without programming language experience, we can simply understand how ZapWorks function and easy for us to employed basic design elements of AR." (Simple and Easy, 24/5/2023)*

Respondent 6: *"We are lecturers Art & Design courses agreed this AR tools design elements are easy and simple to use in AD courses." (Simple and Easy, 24/5/2023)*

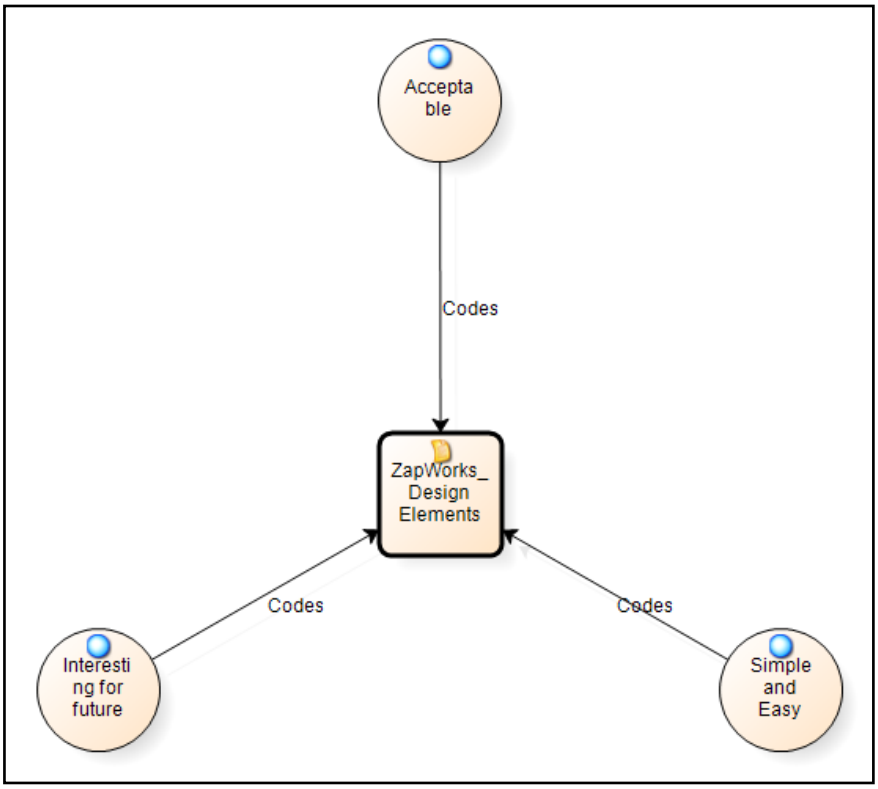


Figure 1. NVivo Data Visualisation Graph for Design Elements in ZapWorks

The figure above shows a data visualisation graph for design elements in ZapWorks generated by NVivo instruments. The result displayed nodes such as all respondents can accept ZapWorks and they are interested in exploring more in the future. For them, ZapWorks platform was simple and easy to use; they just utilised drag-and-drop features.

Conclusion

The outcomes obtained from the ZapWorks workshop can be beneficial for educators and students in the Faculty of Art and Design. This demonstration of ZapWorks can provide educators with the ability to start incorporating augmented reality experiences into their educational programmes and lessons in a simple and easy approach.

During this demonstration, you will see how the Designer application may be used to demonstrate and establish augmented reality (AR) apps as well as the design components of AR app creation.

Nowadays, the image processing techniques that are often associated with augmented reality, which are often used in various areas of education, may further expand their contribution to the field of education by interacting with augmented reality (Yaman and Karakose, 2016).

According to Özcan et al (2017) stated the incorporation of augmented reality in learning and instructional environments has been seen to have beneficial impacts to the fulfilment and achievement of students, according to the initial findings.

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