**ORIGINAL ARTICLE**

# USABILITY OF AUGMENTED REALITY LEARNING WITH GOOGLE

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## Abstract

This paper discusses the mobile search on Google which can be inserted virtual animals in 3D into the real world via augmented reality. Recently people were able to record virtual materials via video from Android mobile phones, such as on iOS, or that can also view up close Module Apollo 11, or closer in time. People can take pictures with a virtual Santa Claus by using augmented reality app. This research method used literature review, which included new insights into the quality of action and scientific papers. It synthesized information gleaned from a variety of sources. The findings of the study are mobile search on google offer possibilities that allow us to interact with 3D elements. Through augmented reality, kids can be considered fun learning for the little one and their parents. By clicking on "See in 3D", students can interact with the respective 3D elements, developed in collaboration with visual materials. People have started using webcams, making them read certain marker labels, then objects where labels will appear on the screen. Developers continue to gather information on how AR (augmented reality) can participate in the learning environment.

**Keywords:** Mobile devices, Augmented reality, Digital learning, Google maps

## Introduction

In the past 5 years, virtual reality (VR) and augmented reality (AR) have attracted the interest of investors and the public, especially after Mark Zuckerberg bought Oculus for $2 billion. Currently, many other companies, such as Sony, Samsung, HTC, and Google, are making large investments

in VR and AR. However, if VR has been used in research for more than 25 years, and there are now more than 1,000 papers and many researchers in the field, forming a strong interdisciplinary community, then the history of AR applications will be even closer (Maiia, 2020)[1]. The research question of the paper is the process of meeting the diverse needs of individuals. Advances in information and communication technology (ICT) have not only expanded educational coverage through e-learning through the use of various online platforms available today. The learning experience has been proven to affect the learning process in different ways. The evidence is ubiquitous learning (u-learning), augmented reality (AR), virtual reality (VR), mobile learning (m-learning), gaming, gamification, or learning analysis. Similarly, the latest technological developments have led to more frequent use of mobile devices in education, especially for children with disabilities or children with different educational needs.

**Augmented Reality (AR)**

Augmented reality (AR) is the interactive experience of a real-world environment in which objects present in the real world are augmented with computer -generated perceptual information, sometimes across a variety of sensory modalities, including sight, hearing, touch, somatosensory and smell. AR can be defined as a system with three important features: real and virtual world integration, real -time interaction and accurate 3D virtual and real object registration. Overlapping sensory information can be constructive (i.e. added to the natural environment) or destructive (i.e. obscure the natural environment)[6].

**Virtual reality (VR)**

Virtual reality (VR) is a simulated experience that can be similar or completely different from the real world. Virtual reality applications include entertainment (especially video games), education (such as medical or military training), and business (such as virtual meetings). Other types of different VR-style technologies include augmented reality and mixed reality, sometimes called advanced reality or XR[16].

Currently, standard virtual reality systems use virtual reality headsets or multi-projection environments to generate realistic images, sounds, and other sensations that simulate the user's actual presence in the virtual environment. A person using a virtual reality device can see the artificial world, move within it and interact with virtual features or objects. This effect is usually created by a VR headset consisting of a head-mounted display and a small screen in front of you, but it can also be created by a specially designed room with multiple large screens. Virtual reality often combines auditory and video feedback, but may also allow other types of sensory and forced feedback through haptic technology[16].

The importance of this study is AR technology allows a combination of real objects and virtual information to enhance students 'interaction with the physical environment and promote their learning. Advances in technology allow students to learn complex topics in a fun and easy way through virtual reality equipment. Google tells us that we can also explore the human body, see an enlarged microscopic worldview, or that we can also turn our home into an original museum. It is enough that we do related searches such as circulatory system or bone system so that, by clicking on "View in 3D", we can explore it through our ~~own~~ mobile device, ~~so as~~ to be able to get more information about each element in each human body system through label. To have an enlarged view of the microscopic world, we can perform cell-related searches such as animal cells or mitochondria. By clicking on "See in 3D", we can interact with the respective 3D elements. The 3D elements developed in collaboration with Visual Body. The 3D elements can magnify or move to find out what is in it and even know each of its components. And if we want to turn our house into a museum We can search in Apollo 11 to have a commando module in 3D, Neil Armstrong to see the space its size, or in Chauvet Cave to see cave paintings nearby (Maiia, 2020)[1].

**Literature Review**

Technology combining rich media and interaction has demonstrated the educational potential applied by scholars, teachers and students. Instead of focusing on memorization, students experience adaptive learning experiences based on the current context. Additional content can be dynamically adapted to the natural environment of learners by displaying text, images, video or even playing audio (music or speech). This additional information is usually shown in a pop-up window for computer-based environments. A large number of additional learning implementations are forms of e-learning. In a desktop computing environment, students receive additional contextual information through an on-screen pop-up window, toolbar, or sidebar. As users navigate a website, email or document, Students' associate additional information with key text selected by mouse, touch, or other input devices. In the mobile environment, additional learning has also been applied on tablets and smartphones.

Augmented learning is closely related to increased intelligence (reinforcement of intelligence) and increased statement. Augmented intelligence applies information processing capabilities to expand the processing capabilities of the human mind through distributed cognition. Additional intelligence provides additional support for autonomous intelligence and has a long history of success. Mechanical and electronic devices that serve as additional intelligence range from abacus, calculators, personal computers, and smartphones. Software with additional intelligence provides additional information relevant to the user's context. When an individual's name appears on the screen, a pop-up window can display the organization's contacts, contact information, and recent interactions. In mobile reality systems (Tosti, 2014)[2], annotations may appear on students individual head displays or through headphones for audio instructions. For example, the app for Google Glasses can provide video tutorials and interactive clicks (Holmgren

& Johansso, 2014)[3]. Foreign language educators are also beginning to incorporate additional learning techniques for traditional paper and pen-based exercises. For example, additional information is presented near the main subject, allowing students to learn to write glyphs while understanding the meaning of the underlying characters.

Thus, cognitive theory is relevant to AR and VR.Cognitive theory has evolved over time, broken down into sub theories that focus on unique elements of learning and understanding. At the most basic level, cognitive theory argues that both internal thinking and external forces are important components of the cognitive process. When students understand how their thinking affects their learning and behavior, they are better able to control it.Cognitive learning theory affects students because their understanding of thought processes helps them learn. Teachers can give students opportunities to ask questions, fail, and think out loud. These strategies can help students understand how their thought processes work and use this knowledge to build better learning opportunities.

## Methodology

The researcher used a comprehensive research design namely research synthesis. Research synthesis is the process of combining the results of a major research aimed at testing the same conceptual hypothesis. It can be used for quantitative or qualitative research. The overall goal is to make the results from various studies more versatile and feasible. The goal is to generate new knowledge by combining and comparing the results of various studies on specific topics. One method is to use a systematic survey method.

## Findings

Improvement tools can help students understand problems, obtain relevant information, and solve complex problems by delivering additional information on-demand. This is in contrast to traditional methods of associative learning, including rote learning, classical habituation, and observational learning, where learning is done earlier than students need to remember or apply what has been learned. Snyder and Wilson (NYMCTU, 2021)[4] stressed that timely learning is not enough. Long-term learning demands continuous training to be made individually and built on individual competencies and strengths. Additional learning tools have been useful for students to gain a better understanding of words or to comprehend foreign languages. The interactive and dynamic nature of these on-demand language assistants can provide definitions, example sentences, and even audible pronunciations. When a sentence or block of text is selected, the words are read aloud as the user follows along with the original or phonetic text. Speech rate control can adapt text-to-speech to follow student comprehension. The rising statement has long developed in science, but is still in its infancy (Cheng & Tsai, 2012)[5]. They have started using webcams, making them read certain marker labels, then objects where labels will appear on the screen. Developers

continue to gather information on how AR (augmented reality) can participate in the learning environment. In recent years there have been technologies added to the classroom such as computers, laptops, projectors, whiteboards, and more. This allows students to be more involved in what is happening (Cheng & Tsai, 2012)[5].

Students can also now take notes without having to listen to what the teacher has to say, instead of writing what they type on the projector (Klopfer, 2018). The notes can be more thorough and accurate, rather than an overall explanation. With the help of AR, we can also see pictures on the board showing students the space between specific objects such as planets or atoms. One researcher (Klopfer, 2018)[6] has suggested that handheld devices such as mobile phones and mobile game machines (Game Boy, PlayStation Portable) can affect learning. This mobile device excels in its mobile convenience, context sensitivity, connectivity, and availability. In this case, the mobile device and its data transfer mechanism should be able to manage all available resources and connection time efficiently and efficiently, while avoiding the loss of massive user data. By incorporating social dynamics in a real-world context, learning games can create an engaging environment for students. Near the Allard Pierson Museum in Amsterdam, visitors view information on demand at the "Future for the Past" exhibition. In the virtual reconstruction of the Satricum and the Romanum Forum, users were able to invoke information spread out on room-sized photographs and other photographs. The museum uses still displays and portable computers to allow users to view translucent photographs and special attention-grabbing information (Hupperetz, 2013)[7]. Critics may see increased learning as a support that hinders memorization; similar arguments have been made about the use of calculators in the past. Just as rote learning is also not a substitute for comprehension, additional learning is just another faculty to help students remember, present, and process information. Current research shows that unconscious visual learning can be effective (Seitz, et.al, 2009)[8]. Visual stimuli, given in an instant of information, show signs of learning even when human adult subjects are unaware of the stimulus or the possibility of reward.

Additional learning not only allows students to learn, but also their parents. Tools such as mobile games have made it easier for parents to understand what their children are learning in school. Technology is bringing children's content to a new platform that can help parents as they strive to make meaningful connections to what their children are learning in school (Klopfer, 2008)[9]. Furthermore, augmented reality has brought new ways of learning for children to possess the ability to articulate words. Using bookmark labels in books read by tablets, make images appear on the screen along with audio narration for enhanced reading (Cheng & Tsai, 2014)[10]. Augmented Reality in education has the potential to change the timing and location of conventional learning processes. This learning style introduces new learning methods. With the boom of technology and younger students becoming the biggest users, learning platforms can connect this generation and their smartphones to gain knowledge. This learning style can attract students 'attention and expand their interest in subjects and topics that they would not have studied or encountered in conventional classroom lectures. Additional data such as interesting facts, visual models, or historical data from events can provide a broader understanding of the topic being

taught. The learning platform hopes to clarify abstract concepts, engage and interact with students, and discover and learn additional information about what they should learn.

Educational technology is a term used to describe various software and hardware related to teaching and learning, which are increasingly used in college and university classrooms. The main goal of educational technology (also known as Ed Tech) is to create a better learning environment, thereby improving students' academic performance. It has also been proven to increase student participation and classroom participation. Educational technology refers to technologies that generally help promote collaboration in an active learning environment. Using educational technology, educators can create digital interactive textbooks, gamified courses, attend, assign homework, conduct quizzes and tests, and obtain real-time results related to textbooks, styles, and formats. Educational technology has overturned traditional education and teaching methods by providing teachers and students with the ability to learn in an augmented environment using familiar devices (such as smartphones, laptops, and tablets) (J. Bransford, et.al, 2000)[11]. Electronic literacy is the ability and understanding of an individual in the use of information technology. Electronic literacy includes the skills required to use available materials, tools, and resources effectively. Electronic literature refers to the digital skills and technologies required to navigate in an augmented online learning environment. Today's students are members of Generation Z and have often read via e-mail since they were young, but this can be more difficult (Crompton, 2013)[12].

## Discussion

The value of AR in education is closely related to the way it designs, implements, and integrates into formal and informal learning environments (Moro, 2017)[27]. An important consideration is how AR technology supports and provides meaningful learning (Moro, 2017)[27]. Treating AR as a concept rather than a specific type of technology is fruitful for educators (Moro, 2017)[27]. The participation of educators is very important to promote the development of appropriate AR teaching applications, which increases the potential of AR in education (Sharmin & Chow, 2020)[28]. AR applications have been developed for many educational fields (N. Loorbach, 2015)[29]. Some of these AR applications have been used in previous studies and were tested the impact of AR-enhanced science textbooks on Malaysian elementary school students (Klimova, et al, 2018)[30]. Tested the use of an AR-based mobile learning system in the natural science inquiry activities of fourth-grade students in Taiwan. The system guides students to the target ecological area and displays the corresponding learning tasks or related learning materials (L. Sullivan, 2013)[31]. Akçayır[32] said the use of AR-enhanced laboratory manuals was tested in the science laboratory of first-year students in Turkey. This study tested the impact of the Anatomy 4D mobile application on the learning motivation of ICT health science undergraduates. The use of Information and Communication Technology (ICT) in education has spread rapidly in the world including Malaysia. ICT integration can give students more benefits, it is considered important for schools and institutions to provide the best-integrated ICT education to students, because ICT can

actually improve student performance and achievement (Luaran, 2013)[13]. Therefore, the world of technology education has now integrated various technologies in education such as the use of websites, the use of online applications as well as mediated reality, this is because learning methods will become more interesting in the presence of technology like this. According to Weng and Bee[14], mediated reality technology is used to increase the effectiveness and attractiveness of the student learning environment in real-world scenarios. In addition, the use of mediated reality in learning can also facilitate the delivery of concepts that difficult to teach and students are also able to solve complex problems more easily through combination information from the real world with virtual information (Tobar, et.al, 2017)[15]. So it is can improve students' learning and cognitive (Cai, et.al, 2016)[16].

In addition, the technology to be used must be in line with the ability of the age of the student's secondary school. So the selection of the appropriate type of technology and approach when applying the technology during teaching and learning sessions it is important to ensure that technology can deliver the learning content to be delivered. One of the appropriate approaches used is game-based learning. Past studies state game-based learning produces many positive effects on student learning such as motivation, achievement, and student perceptions of learning (Ku, et.al, 2016)[17]. Therefore, teachers need to implement game-based learning in the classroom so that students have the opportunity to highlight their potential and talents (Yusniza, 2019)[18]. A fusion between ICT facilities and a game-based learning approach is expected can help high school students in learning a skill. In line with the will government in the absorption of Cross-curricular Elements (CCE) in each subject. The purpose of EMK applied in each subject is to strengthen the implementation of the School Standard Curriculum Secondary (Ministry of Education Malaysia (a), 2016)[19]. So, using teaching aids that use technologies such as mediated reality and learning approaches game-based is very important in student learning. It is so, because the method is effective methods in delivering learning content and can improve student achievement.

The Ministry of Education Malaysia is aware of these changes and has taken steps to improve Malaysian education by introducing the Malaysian Education Blueprint (2013-2025). In addition, the Ministry of Education Malaysia also recommends an Integrated School Curriculum Secondary (KBSM) for each subject including Geography revised (Ministry of Education Malaysia (a), 2016)[19]. After checking the result of the Curriculum Secondary School Standard (KSSM) which was first used in 2017. The focus of the Secondary School Standard Curriculum (KSSM) Geography of lower secondary level is more to the mastery of basic knowledge (Ministry of Education Malaysia (b)[20], 2016). Zohir (2016)[21] states Geography is a compulsory subject for all form one to form three students and teachers who teach Geography subjects need to improve their knowledge and skills on current issues, methods teaching in 21st century education as well as ICT skills to produce students who can use a variety of ideas, principles of geography and make judgments of specific issues.

The topic of Wind Direction and Angular Bearing is the first topic in the Geography syllabus level one and is one of the titles under Geographical Skills. Geography skills enable

students to study and relate in the spatial organization as well as focus on deep skills the use of basic tools such as compasses, measuring instruments, atlases, and globes (Malaysia Ministry of Education (b), 2016)[20]. Students need to master this topic before studying the next topic, because this topic is the basic knowledge and skills in the subject of Geography. When this topic is only taught using map media it will cause students to misunderstand and not be able to determine direction correctly as well as affecting students 'mastery of other learning (Munawir, 2020)[22]. If this problem is not resolved immediately the student will continue to do so the same error (Munawir, 2020)[22]. Apart from game-based learning that is integrated with student learning, the integration of intermediate reality technologies is also seen as one of the factors contributing to achievement in students. This is in line with the study of Lu et al. (2020)[23] who showed there was an increase in student achievement once they use mediated reality technology integrated into the game. This also applies supported by Hwang et al. 2016)[24] who stated that the reality-based game approach is mediated can improve not only students' attitudes in learning, but it can also improve achievement students. In addition, the findings of a study by Kamlşll and Öznacar (2020)[25] also prove that the use mediated reality technology in learning can improve student academic achievement. The findings of a study by Sahin and Yilmaz (2017)[26] also prove that the use of reality applications-mediated have a positive and significant impact on student academic achievement and attitudes. With the help of mediated reality applications, students are able to see physically abstract concepts through 3D virtual objects to achieve more meaningful learning. Based on studies conducted by them as well found that students were happy and wanted to continue using mediated reality in the future. This suggests that students prefer an approach that uses applications mediated reality as opposed to conventional methods in the learning process. Thus, the research question has been answered to study the effects of game-based learning integrated with the Traveler Kit using mediated reality applications in the topics of Wind Direction and Angular Bearing. Systematic mapping methods to reveal VR design elements can be used to teach different types of learning content, such as declarative knowledge or procedural and practical knowledge. Instead, the characteristics of VR applications are analyzed at a more abstract level, and various application areas such as medicine or psychology are used to map these applications. Such a thing because, there is an improvement in student achievement in the topics of Wind Direction and Angular Bearing after them using the Traveler Kit in learning.

## Conclusion

With AR, classroom education can be extraordinary and more interactive, as AR allows teachers to demonstrate virtual examples of concepts and add game elements to provide textbook material support. This will allow students to learn and remember information more quickly. Human memory will not easily forget visual effects. AR increases participation and interactivity, and provides a richer user experience. Research shows that augmented reality enhances the perception of product and brand value. A well-executed AR campaign provides the innovation and responsiveness of a forward-thinking brand. In Computer Science, online machine learning is a machine learning method in which data is available in sequential order and used to update the best

predictions for future data at each step, as opposed to group learning techniques that produce the best predictions by studying ~~on~~ the entire set of training data. at once. Online learning is a common technique used in the field of machine learning where it is computationally impossible to train an entire set of data, requiring beyond the core of the algorithm. It is also used in situations where it is necessary for the algorithm to dynamically adapt to new patterns in the data, or when the data itself has generated as a function of time, e.g., stock price forecasts by augmented learning approaches.

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