

ONLINE LEARNING: SIGNAL INTEGRATION AND AUGMENTED REALITY HELPING CHILDREN WITH DOWN SYNDROME

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ABSTRACT

Purpose: This study focuses on how online learning can aid in the development of the *Augmented Reality* (AR) technology, "Mar-Care", which possesses features that will attract elementary students to learn Makaton. Makaton is a Sign Language whose inception dates back to around 1972/73 and it was meant to be used by people with learning disabilities to help develop language and communication skills. This study online learning involves AR technology and the use of *Padlet* as e-learning platforms a forum for students to discuss and express their opinions.

Design: The methods used throughout the production of Mar-Care application technology education learning online tools are the *Padlet* platform.

Findings: Visual representation of the basic hand gestures through 3D animation is shown on the *Padlet* to explain online learning

Research limitations: This study has developed an online medium for online learning.

Practical implications: A large number of software used to produce online learning tools successfully make the discussion space between students and teachers.

Paper type: Research Paper

Keyword: Augmented reality, Online Learning, *Padlet*

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I. INTRODUCTION

The COVID-19 pandemic has changed the landscape of human life today. With the Movement Control Order (MCO) currently being enforced, individuals who do not have a specific role in the main services need to be in their home, minimize movement and reduce contact (contact). Although we feel its negative effects in terms of movement, socialization, work and so on. In terms of education, schools and higher education institutions (HEIs) are also changing the way education is being implemented online (Ahlam, 2016) Online learning can actually produce someone with Life Long Learning skills. These lifelong learning skills are one of the key skills in the 21st Century Skills that every person should master. Implementing online learning requires students to develop lifelong learning skills. Students can no longer use a set of pre-requisites to wait for a lecturer or lecturers to speak or attending a lecture to begin learning (Ang, 2016) Students need to decide what to study, find materials that teachers or lecturers have placed on virtual learning platforms such as Google Classroom and other e-learning platforms, and then devote their own time to researching the material

and then completing it. Students need to learn about priorities. Especially when it comes to time management, which materials need to be learned and resolved first and so forth. Exposure to these kinds of activities might lead to students' change in their perception which then leads to the aforementioned party to have a more open-minded view in researching other learning materials online on their own instead of merely relying on lectures, as finding authentic learning materials is also one of the lifelong learning skills that needs to be developed (Fransiska, Akhriza and Primandari, 2017). This may include notes or electronic books from top universities, videos and open learning platforms such as the free Massive Open Online Courses (MOOC).

II. LITERATURE

The study of literature will discuss the five main points in this study namely digital learning, AR, hand signal language. Online learning is one of the modules in the study in progress. The existence of this module is technology AR. Online learning module will be revealed first to the students to observe how students can understand hand-sign language, re-perform a hand signal style and interact with objects of AR.

A. Online Learning

Digital learning is a unique and systematic teaching and learning to facilitate students to learn alone to master a unit of learning easily and accurately (Sidek Mohd. Noah and Jamaludin Ahmad, 2005). This lesson module involves a group or online class. In fact, the online learning module function brings students specialized student to the down syndrome of the positive change (Abas,2010). Technology in education helps students to maintain interest and to encourage learning and to attract students will increase when it is able to improve existing materials and the latest information in education.

B. Augmented Reality

AR is a variation to the virtual environment. AR involves interactions, virtual content, real environment and imagination. This gives a new learning experience to the students Down syndrome. AR is not a single app, it uses a computer, a Web camera or a *head-mounted* display to support its functions. Research on AR and education many are carried out outside as well as in the country.

The first AR component is the user where AR is used to enhance interaction between users and the real world and make it easier for the user to get information by seeing an insight through the application in AR. In fact, able to provide Motivation to student's syndrome down as interaction with students that affect the process of learning in classroom (Chen, 2006). Digital learning involving technology AR can provide a physical experience, virtual content and imagination of an ideal entertainment student (Juan, Beatrice & Cano, 2008). To motivate and focus the benefits of learning with the use of technology as well as to build a dynamic 3D process (Dünser, 2008). All of these researches are focused on multimedia and 3D technology elements that combining with exposure to the AR technology in education.

III. METHODOLOGY

A. Basic Temporary Online Teaching Planning

With the possible disruption of social gatherings as presented by the coronavirus, there is an increase in discussion and discourse around the plan in implementing the use of online learning as a continuity plan for most universities and schools. While there seems to be more fervor around this idea than in the past, this is no different than other times when online learning has been considered as part of an instructional continuity plan. A number of resources and ideas has been shared, but many of them focus more on institutional plans or the technical how-to. This particular paper is here to provide an instructional planning guide that individual instructors can use.

The first tendency may be to ask what tools can be used to deliver live lectures so students don't miss a lecture. the guide is aimed not at the permanent movement from face-to-face to online education but at the desire to implement an interim solution for emergency remote teaching and is specifically focused on lecture-based classes with some considerations for more active learning environments.

B. Basic student needs

Students will need to access to reading and course materials and a platform to submit assignments and receive feedback on their work.

C. Basic instructor needs

Teachers need to find a way of publishing their content of learning to students in a form that students can access. Therefore, teachers need applications that can convert learning materials into softcopy.

D. Learning Management System (LMS)

These requirements are generally met by utilizing the existing Learning Management System (LMS) such as:

- Google Classroom
- Moodle
- Schoology
- Padlet

One of the great aspects about LMS above is that, when learning and teaching go back to face-to-face mode, the activities that take place online using the LMS can continue without much hassle.



Figure 1 – Best LMS option for online learning

IV. RESULTS AND DISCUSSION

Padlet is an online learning platform that can display ideas through electronic stickers on shared digital channels. Students can type in electronic stickers that can combine images, audio and video using appropriate web links. With the use of this platform, students are more active in the teaching and learning process as they interact with the world of information technology. The *Padlet* interface is very simple and user friendly, which allows users to fill in or write differing opinions based on questions raised by the lecturer.

Student down is chosen as the target people in this research because, this time is no special Kit dedicated to training them to learn the hands-on language signals for interacted. With the rapid involvement of technology in Malaysia, the special learning of the down-the-art syndrome can be adapting in teaching and learning at primary schools and special educational centers (Asma Abdullah, 2014).

Mar-Care Kit's is the integration of hardware and AR technology materialize the interactive application is an easily accessible application for anyone with a smart phone to make it easier for students or families to learn sign languages. In addition, it can grab the students' attention to see them and their students as they complement the moving image with combinations of cheerful and attractive colors can to enhance the interest of elementary students. In fact, before developing this application, the researcher observed the habit of elementary children, which we established earlier as in need of guidance, for two months. MAR-Care's decidedly active nature make students feeling joyful as it allows them to play while studying (Haryani and Triyono, 2017).

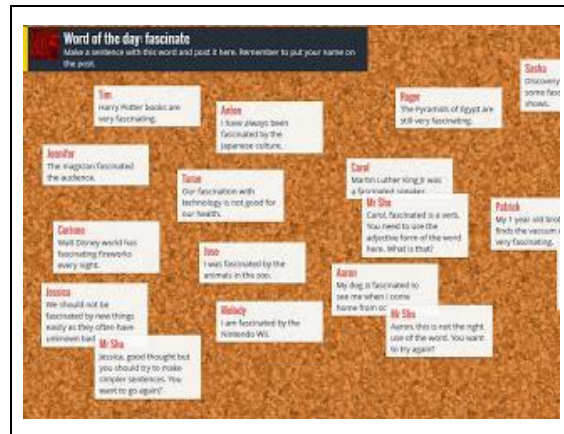


Figure 2 – Padlet interface

Examples of online learning using *Padlet* with MAR-Care kit are as in Fig. 3. It shows the use of the *Padlet* application as a learning area with students with Mar Care. Adhesive notes and 3D moving image and video by MAR-Care are provided in *Padlet* and are used as a forum for discussion among students and lecturers (Dunst, Meter and Hamby,2011). In fact, students can generate ideas through the way they contribute or give feedback on an idea.

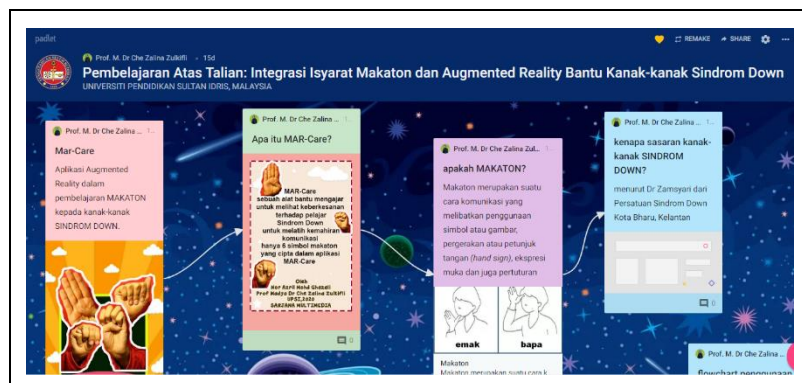


Figure 3 –The interface makes it easy to implement

Figure 3 - The interface makes it easy to implement online teaching as it has some basis in regards to the Makaton Signal Integration and *Augmented Reality*, and it has the potential to be particularly helpful for Children with Down Syndrome



Figure 4 - How interactive materials sharing can be implemented

The digital wall allows students to write down any idea of their learning whether through text, picture, video, audio or web link. Other students can comment on other groups' content, thus enabling both students and lecturers to observe both student engagement and the collaborative nature of the discourse. The use of the click and drag concept resembles that of a physical notice board, enabling students to share any ideas and be part of a discourse. The use of *Padlet* makes it easy for students to chat or share information.

A. Taking Accessibility Access to Student

If students have access to the Internet in a very limited capacity, it is recommended that the content in the video format be minimized. If it is still needed, produce videos in short duration, split into multiple videos if necessary. Video resolution can also be moderated or minimized, without compromising the clarity of the text that should be visible on the display.

To enhance the effectiveness of learning, here are some suggestions that would like to highlight:

1. Avoid making it easy for students to simply copy from the Internet, imitate Wikipedia and the likes.
2. Encourage assignments that involve collaboration between students. The collaboration encourages students to discuss and delineate tasks. Provide some space for students to share their reflections on their collaborative experiences before, during and or after an assignment.
3. Involve parents in the assignment. For example, include a section where students need to gain a parent's perspective on the assignment. This can help students improve the meaning of the assignment (meaningfulness).

V. CONCLUSION

Teacher empathy and compassion can help support the cause in inclusive education, especially since teachers had to painstakingly craft and modify their teaching methods to help students who are faced with limited resources and learning difficulties. Educators need to be wise in addressing the issues. Every educator needs to take proactive steps to ensure that no one is left behind throughout the teaching and learning process, and that the main goals of holistic and inclusive learning are achieved.

It is never easy to develop lifelong learning skills. But given the fact that the spread of COVID-19 gave rise to the subsequent implementation of the movement control order, it provides an opportunity to develop this very important skill, a skill that could do wonders in an ever evolving, increasingly digital world.

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Biographies

Nor Azril Mohd Ghazali hold a Bachelor Education of Multimedia, degree at Sultan Idris Education University, Perak, Malaysia. And also, she continues for her Master in Education of Multimedia, Faculty of Art, Computer and Creative Industry. Specifically, she is interested in editing software and programming.

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