So, H. J. et al. (Eds.) (2020). Proceedings of the 28th International Conference on Computers in Education. Asia-Pacific Society for Computers in Education

Using Augmented Reality (AR) in Innovating Pedagogy: Students and Psychologists' Perspectives

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Abstract: Augmented Reality (AR) is one of the emerging technologies of interest and is seen to be applicable in educational context since it is capable of leading richer learning experiences. However, many pieces of research focused on the technicalities, efficacy of various systems, usability, and design but less on how social interactions, or its social-psychological aspects, are affected by the technology. Given that the findings of prior research necessitated elaboration in the social-psychological aspects of the ethical issues of AR through an expert evaluation, this study was conducted to investigate the social-psychological impacts of this immersive technology to students. This study was also conducted to evaluate the students' experiences of using AR technology based on the Psychologists' perspective. It was found out that AR integration to innovate pedagogy could have a significant impact on the learners and the teachers in educational institutions and universities, but there remain a number of challenges and issues on its use.

Keywords: Augmented Reality, Innovating Pedagogy, Ethical Issues, Social Psychology

1. Introduction

Augmented Reality (AR) is one of the emerging technologies of interest and is seen to have a significant impact on the learners and teachers in educational institutions and universities (Chang, Hsu, & Wu, 2016; Sáez-López, Cózar-Gutiérrez, González-Calero, & Carrasco, 2020; EDUCAUSE, 2018). Meta-analysis researches provide evidence of the progress of this emerging and innovative technology in teaching and learning processes (Ozdemir, Sahin, Arcagok, & Demir, 2018; Hantono, Nugroho, & Santosa, 2018). In the learning process, it boosts students' academic achievement compared with engaging in traditional learning methods (Ozdemir et al., 2018). However, many pieces of research focused on the technicalities, efficacy of various systems, usability, and design but less on how social interactions are affected by the technology or its social-psychological aspects (Miller et al., 2019). Social psychology is defined as the pursuit to understand and explain how the actual, imagined, or implied presence of others influences the thoughts, feelings, and behavior of individuals (Allport, 1979). Given that the findings of prior research (Trapero, 2018) necessitated elaboration in the social-psychological aspects of the ethical issues of AR through an expert evaluation, this study was conducted to investigate the social-psychological impacts of this immersive technology to students.

2. Methodology

In the previous study (Trapero, 2018), thirty-Nine (39) Grade 7 students from the University of the Philippines Cebu (UPC) were identified as the respondents of the study since they are the youngest group among high school students. This is because young individuals now are becoming accustomed to

vast information access (Shamir, 2013) and because the study aimed to evaluate the ethical issues of AR in the early stage of the learning process. The qualitative data from the previous study were collated and analyzed to further elucidate the study. These data were evaluated by two psychologists for evaluation and analysis. Findings, conclusions, and recommendations were then formulated and presented.

3. Results and Findings

3.1 Psychologists' Social-Psychological Evaluation of Students' Experiences with AR Apps

P1: *"From the psychological point of view, whenever we have a problem, regardless whether we are a student or not, we are taught about how important it is to connect with the support system like family, close friends, professionals, and other people whom we can trust. With the advent of AR technology, engaging in it is a setback to our face-to-face communication, which is supposedly considered as therapeutic. AR can alienate us further. For example, a person does not walk, jog, or talk with friends anymore because he/she is already engrossed and busy with an AR app. A person will not engage in sports anymore, which might lead to negative consequences in health, will not connect with nature like climbing mountains, going to the beach, and other outdoor activities which should supposedly be done to stay healthy and to unwind from stressful situations."*

Using an AR app may lead to a risk of developing a personality disorder; however, this is highly theoretical and needs actual research. Whenever we have a problem, there is always a limit as to how much we can handle it. A series of overwhelming problems, unfortunate events, and others will sometimes force us to dissociate from our "real" problematic self and create an "imaginary" self where all our problems do not exist. It is like our last resort to survive, denying that all our problems existed, like in Dissociative Identity Disorder. AR can be a trigger, or should I say, can encourage people to create an imaginary self since face-to-face communication is already absent. For instance, an introvert and problematic student with a dysfunctional family system are introduced to AR which may assume an imaginary character who is successful, has no problem, and who possesses qualities that are difficult to achieve in real life. There is a possibility that the like between fantasy and reality will get blurred for that student. This will also lead him/her to start imagining that he/she is that AR character and act like one and deny the existence of his/her self. This is already an alarming personality condition and is not good anymore.

Another risk is the risk to trigger a trauma if a student has a childhood traumatic experience such as molestation, terrible accident, and others, which was not taken away from him/her because of the absence of therapy. The traumatic memories are just suppressed by a person and any significant keyword, may it be an event, image, person/character with the same behavior as a perpetrator (in case of trauma due to rape or molestation) and others that a student will experience or will see in an AR app will immediately trigger the trauma to surface. So, if an AR app is used to facilitate learning in the classroom setting, that is a good intention, but if there are trauma cases that the school or the teacher is unaware of, it will drive the student not to go to school anymore, instead of learning."

P2: *"Augmented Reality is an interesting technological innovation, however, the biggest challenges on the risks in Table 2 would be: 1) they are being prone to accident, 2) an AR app makes them addicted to it, 3) it makes them lazy, and 4) it increases the possibility of acquiring a sickness. So, if I were a parent, I will not allow my child to engage in it, unless I get the trust and assurance for the safety of my child."*

3.2. Psychologists' Recommended Precautions

P1:
- *Educate the students about the importance/benefits of face-to-face communication, personal interactions, activities, sports, and others to their psychological, physiological well-being, among others.*
- *School administrators/teachers should craft strict policies to limit AR app usage of students (e.g.: during classes no using of smartphones unless allowed by the teacher, if they connect to the*

internet using the public school Wi-Fi, the school can restrict access to AR apps or impose a time limit in their access to Wi-Fi. Another way is to design group activities, assignments, and other classroom activities that will discourage them from using their smartphones and force them to talk to their classmates, friends, or interview people.

- *Parents can impose their own rules as well, outside school premises, it is the responsibility of the parents to monitor and limit smartphone usage or AR apps usage. (e.g.: by 7 pm no more using of smartphones, strictly reading or study for exams).*
- *School psychologists or counselors can help as well through counseling and other psychological interventions in cases where teachers and parents are no longer effective in limiting the student's AR exposure.*

P2: - *There should be a guidance counselor to assure that the students will not get addicted and prevent them from becoming socially isolated individuals.*

- *Parents should encourage the students to limit the use of AR apps and continue social development to eliminate the issue of the negative changes in behavior.*

Conclusion

Augmented Reality integration to innovate pedagogy could have a significant impact on the learners and the teachers in the educational institutions and university, but there remain a number of challenges and issues on its use. It can increase the students' motivation in the learning process, provide fun and stimulation, enhance their learning interests and self-confidence, and serves as a useful tool for teachers in improving their teaching effectiveness since it enables the integration of the real-world with the learning environment. However, risks and disadvantages on young individuals are also apparent, particularly in social, visual, and motor development. Thus, rules on limiting the AR app usage should be imposed in school and at home, since engaging in it is a setback to their face-to-face communication and getting hooked to it may alienate them further. Parents and teachers are advised to constantly monitor their child's use of immersive technologies like AR apps. Lastly, psychological intervention should be provided to give assurance that students to prevent addiction, mitigate the risk of developing a personality disorder, and to prevent them from becoming socially isolated individuals.

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