Chapter 53

Virtual Reality Immersion for ‘Education 4.0’
English Education: ELSA 360°-Videos Project
– Phase 2

Airil Haimi Mohd Adnan, Muhamad Khairul Ahmad, Muhammad Anwar
Mohd Kamal, Nurul Nadiah Mustafa Kamal, Ahmad Muhyiddin Yusof &
Nurul Munirah Azamri

Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus,
32610 Bandar Seri Iskandar, Perak, Malaysia

admin@uforia.edu.my

ABSTRACT

Many university educators still teach using ‘old-school’ methods and fail to utilise ‘Education 4.0’ technological tools to support and enhance the teaching and learning process. Having little technical know-how and being reluctant to spend their time and money to learn ‘Industry 4.0’ skills, these educators will find it increasingly difficult to meet the high expectations of today’s young learners. A case in point in learning technology for the Education 4.0 and Industry 4.0 era is virtual reality (VR). Today, educators can actually (read: easily) create immersive real life VR contents using 360° cameras to deliver lessons anytime and anywhere. Our English Language Simulations Augmented with 360-degrees spherical videos or ELSA 360°-Videos is one such project. We have undertaken this learning technology project without any financial support from any parties and we continue to rely on our own efforts to reskill and upskill our pedagogical and technological knowledge, to be in tandem with the changes brought by Education 4.0 and to face the disruptions created by Industry 4.0. After more than 10 months of implementation since the beginning of 2019, the project has won many awards and received much publicity in Malaysian national newspapers. This chapter reports on our efforts to propel the ELSA 360°-Videos project to its second phase of implementation: Fully immersive VR experiences to help university students to learn about and to use English for Business and Professional Interactions. From simple 360-degrees spherical videos, the second phase of ELSA 360°-Videos will be available as commercial e-Learning products on the ‘VeeR’ 360-degrees VR content creation and sharing platform. Through VR, students who use ELSA 360°-Videos will now be able to immerse themselves and
interact with virtual environments in meeting rooms, to see how colleagues react to each other when they share ideas and deal with issues, and to learn essential workplace language skills. ELSA 360°-Videos are unscripted and produced under actual test conditions; i.e., the simulations are authentic and real. The students or end-users of ELSA 360°-Videos can access VeeR online and learn anytime and anywhere; Total immersion plus interaction with virtual environments can now be attained using inexpensive smartphone-powered VR goggles; Weaker learners have the autonomy to revise and learn at their own pace. The benefits of 360° spherical videos in language learning content delivery outweigh difficulties in producing high-quality content, and challenges in helping Malaysian university students to adopt a positive mindset to engage with VR technology.

**Key Words:** Education 4.0, English language, Immersive learning, Spherical videos, Virtual reality.

1. **INTRODUCTION AND BACKGROUND**

We are living within an age of ‘disruptions’ where drastic changes are rapidly becoming real, and future technologies that are highlighted in comic books, science fiction novels and futuristic films are fast becoming part of our daily lives (Adnan, 2019). Over the past few years, technology-mediated realities such as Augmented Reality (AR), Virtual Reality (VR) and 360°-Videos have shown potential to enhance student learning. Ehlers and Kellermann (2019), Schwab (2016), and Schwab and Davis (2018) argue whether or not the 4th Industrial Revolution (or IR40) is a mere phrase, but the reality is that unprecedented changes are occurring in many aspects of contemporary life without any indications of slowing down. In the field of education, for example, in the Malaysian and ASEAN settings in particular, these countries are catching up to guarantee that IR40 disruptions do not have adverse effects on the teaching and learning process (Adnan, 2018). As such, many learners and educators are even more keen towards acquiring new skills and knowledge with this fresh shift in technological advancement (see Rahmat, Adnan & Mohtar, 2019).

At the same time, the realm of education has shifted into the next monumental stage: Education 4.0 (or EDU40) as human civilisation moves rapidly beyond the IR40 age. Formal education is evolving as the number of learners are increasingly growing around the world. Today’s formal education is required to do more than just facilitate the cultural changes of the 1960s through the 70s, 80s and beyond (see Doucet, Evers, Guerra, Lopez, Soskil & Timmers, 2018). As the world prepares for year 2020, the EDU40 domain must tackle the problems of globalisation dynamically and cope with never-seen-before innovations in IR40-sparked computers and telecommunications systems. Araya (2015) and Gleason (2018) state that in an age of evolving innovation, nothing less than revolutionary instructional structures will be required in the world's developing and advanced countries.

Within the Malaysian education sector, fundamental changes are also taking place
to prepare young learners as future IR40 knowledge workers and to guarantee that EDU40 becomes an accelerator for beneficial social changes. Malaysian educators need to realise the basic reality that not only young individuals are changing as learners, but the way they learn is also evolving quickly. Thus, educators themselves must be equipped with proper training, be tech-savvy and determined in accordance to this colossal shift in teaching and learning (Adnan & Zamari, 2012a). Failure to close the gap between how teachers today teach and how today’s learners learn will be catastrophic in a world where technological changes that used to occur tomorrow have already occurred yesterday (Adnan, 2018; Rüfenacht, 2017). Our EDU40 learning technology innovation initiative is an attempt to improve the gap in teaching versus learning in tertiary settings, and to reap the benefits of techniques that are aligned with the learning styles of future IR40 knowledge workers (see Mustafa Kamal, Adnan, A. Yusof, Ahmad & Mohd Kamal, 2019). This project also follows the flipped classroom concept (Martin, 2011), in order to promote self-regulated learning outside the lecture room, and to guarantee full use of limited lecture hours for practice and to reinforce previously discussed subject matters.

2. STATEMENT OF PROBLEM

Language teaching and learning is a field that requires the power of imagination (Madigan, 2018; Mohd, Adnan, Yusof, Ahmad & Mohd Kamal, 2019; Zamari & Adnan, 2011). In the current world, English is regarded as a significant language, not only in teaching institutions, but also within society. It is a difficult task for educators to be able to provide learners with the comfort and self-confidence needed in order to converse in English (Ahmad, Adnan, Azamri, Idris, Norafand & Ishak, 2019). One might contend that emphasis should be placed on the skills required to do specific tasks instead of merely concentrating on being able to simply ‘talk’ in English (Adnan & Abdullah, 2014). Without instructed language teaching and learning, it would be tough to understand communicative situations that learners have never encountered before, what more to imagine the abilities required to navigate those situations effectively (Adnan & Zamari, 2012b; Adnan, 2014). The ELSA 360°-Videos project is an effort to bridge this gap for English for Professional and Workplace Interactions learners who need to possess critical abilities such as negotiating with other individuals, conducting official meetings, scheduling business events, managing resources, pitching for lucrative corporate contracts and more. These so-called ‘soft skills’ are vital to learners’ development as they move onto the next stage of life beyond tertiary education.

In the past, these abilities would be trained using workbooks or manuals for ‘Business English’. However, with less and less guided learning hours being allocated for learning English and other language topics in most contexts, newer and more practical strategies are required to improve the delivery of these abilities to learners. Learners must also be provided the space and liberty to learn and deal thoroughly with these abilities on their own, outside the lecture room (Karim, Abu, Adnan & Suhandoko. 2018). For this purpose, we adopted the 360° or spherical video technology 360° in this learning technology project. We believe that 360-degrees or spherical video technology can bring
together the power of imagination with the process of immersion, and to heighten lecturers’ commitment to teaching and students’ engagement with English in the Malaysian academic framework (see Ahmad, Adnan, A. Yusof, Mohd Kamal & Mustafa Kamal, 2019).

3. OBJECTIVES OF THIS LEARNING INNOVATION AND TECHNOLOGY PROJECT

After nearly a year of working on this project, we believe the use of 360° or spherical videos for education delivers many end-user benefits (see Geng, Chai, Jong & Luk, 2019; O’Halloran, Tan, Wiebrands, Sheffield, Wignell & Turner, 2018). 360° video enables learners to better ‘connect’ with their learning by offering concrete visual explanations and examples. In addition, 360° video is a more immersive audio-visual experience that enables learners to interact with their virtual environments. These videos create empathy and understanding by bringing a ‘feeling of presence’ to learners (Mohd Kamal, Adnan, Mustafa Kamal, Ahmad & A. Yusof, 2019). This became vivid once we uploaded a series of 360° or spherical clips online through the ELSA 360°-Videos project. Focusing on a degree level course on English for Professional and Workplace Interactions, the ELSA 360°-Videos project assists undergraduates so that they can experience what it is like to be in a real meeting space, see how colleagues interact with one another, and learn critical communicative abilities to succeed in the future workplace. Without a doubt, these videos increase learners’ language skills by drawing on their imagination.

In other words, instead of bringing students into practice meeting sessions, these videos bring ‘real’ meetings to students. Correspondingly, students may experience the atmosphere of the virtual environment depending on the simulations. As a result, they can learn from these situations on what to say, how to respond to certain questions and ways to adapt themselves to the situations. Specifically, for this learning technology project, an Insta360 ONE X camera was procured (by Airil Haimi) (see Insta360, 2019). All renderings and post-processing were performed using Adobe Premiere Pro CC 2019 together with the proprietary Windows 10 software for Insta360 ONE X.
Despite the fact that this teaching and learning technology innovation project is still relatively new, it became visible that the immersive qualities of these 360° or spherical videos in delivering syllabus content, such as ‘interacting informally with professional peers’ and ‘debating agenda items in an official meeting’ successfully helped our learners to engage more enthusiastically and passionately with such situations. Once they have familiarised themselves with the videos, more practice sessions were conducted, and
improvements were observed. With the introduction of these videos, learners may become braver, their confidence and self-esteem will shine, and their overt English communication skills will improve.

4. THE ELSA 360°-VIDEOS PROJECT: NOVELTY FACTORS

With reference to the English for Professional and Workplace Interactions degree course, the primary novelty value of the ELSA 360°-Videos project resides in the reality that everything we did was spontaneous and recorded under actual test circumstances, i.e. genuine and true. In other words, in the process of videoing the raw simulations for ELSA 360°-Videos, all the actors and actress were only given a background of the situation and no elaborate script was provided to adhere to actual test conditions.

Based on continuous evaluations of workplace-related and professional situations from the actual course, not only did all the clips in the ELSA 360°-Videos project provide positive examples for students to follow, but the videos also helped them prepare for their own continuous evaluations as the semester unfolded. They learned how to respond and react to questions or statements by 'immersing' themselves in the videos we prepared. Other than that, they also learned how to identify and practise which physical emotions and emotional tones should be used whilst interacting at the workplace, by watching the videos. The most interesting part of this project is that it enables learning to occur outside of the valuable face-to-face contact time, i.e. the lecture room. This enabled our learners to gain more confidence when sitting for their evaluations, and at the same time it motivates them to improve themselves continuously. In short, we effectively 'flipped' the classroom as learners were able to access and audio-visually learn about workplace-related and professional English skills even before they attend lectures (Mohd Kamal, Adnan, Azamri, Idris, Zuraimi & M. Yusof, 2019). Thus, classroom contact time can now be fully channelled towards guided practice, and on preparing for course assessments (see Karim, Adnan, Adam & Zaidi, 2019).

Observing the novelty value of this teaching and learning initiative, the Academic Affairs Division (at our campus) chose ELSA 360°-Videos as a keystone 2019-2020 project for curriculum content delivery based on the latest developments in learning technology that draw on IR40 and EDU40 initiatives and principles. This affirms not just the importance of the ELSA 360°-Videos project for the IR40 and EDU40 era, but as a concrete evidence of the concept that we are just beginning to explore regarding the possibilities of what 360° or spherical videos could do in higher education academic settings for both learners and lecturers.
5. THE ELSA 360°-VIDEOS PROJECT: BENEFITS TO USERS AND SOCIETY AT LARGE

As stated in the objective, ELSA 360°-Videos enable learners to connect better with their learning by offering concrete, visual explanations and examples. Through immersive video experiences, the learner can interact with their virtual environment. What surprised us the most was the unexpected benefits of ELSA 360°-Videos for weak English learners; they seemed to gain a lot from this technological instrument as compared to more skilled learners. The opportunities provided for the weaker learners by involving them in job and professional-related settings helped them to be rationale and taught them how they should interact and respond in such office environments. The 360° or spherical videos were initially added to YouTube, the world’s major video sharing platform with an aim to increase access opportunities. Weaker learners who might be having problems in the classroom compared to better students, for instance in communicative tasks, now had a great opportunity to improve their skills on their own (Repetto, Germagnoli, Tribeti & Riva, 2018) and to practice for the course assessments from the convenience of their rented houses or hostel rooms. Learners are able to play, pause, forward or rewind the video as they are learning within 360-degrees ‘freedom of movement’ (technically, 3 DOFs or degrees of freedom) just like in the real world. Hence, the videos make it easier for students to learn business and professional English, just as easy as they could control the speed of the video.
Another benefit of the ELSA 360°-Videos initiative was that some of the learners started to combine their smartphones together with cheap ‘virtual reality’ (VR) goggles, to take their immersive learning experience to the next level. For learners who already had access to such goggles and smartphones (primarily for movie watching or simple VR gaming purposes), engaging with ELSA 360°-Videos was just a natural expansion of what they were already doing with other VR equipment on the World Wide Web. At the
same time, we also began transferring ELSA 360°-Videos materials to alternative online platforms for greater interactivity and engagement for future use; ThingLink and its paid educational content developer model, and VeeR and its free so-called ‘VeeR Experience’ for VR enabled learning opportunities. Within society at large, 360° or spherical videos have earth-shaking potential not just for gaming or entertainment purposes but especially within the educational sphere. Unfortunately for our content development team, much of what we can do at this time is restricted by money. This is due to the fact that state-of-the-art software and online platforms for 360-degrees VR-based learning remain extremely overpriced, and they are the only tools available to create better interactivity and higher engagement through 360° or spherical videos.

6. THE ELSA 360°-VIDEOS PROJECT: MARKET POTENTIALS, AWARDS, RECOGNITIONS AND NATIONAL MASS MEDIA COVERAGE

Beyond a shadow of a doubt, there are enormous potentials for this project. On the other hand, as described in the last section, there are a number of teething problems that need our utmost attention. We found that there are several issues that must be addressed to ensure the sustainability of this project for the future. The biggest issue is the initial cost of producing 360° or spherical videos that can be quite high equipment-wise. For small, non-professional content development teams like ours, proprietary software and online VR content platforms with monthly or annual subscription charges are notoriously costly. However, at this time, there are a number of financing options to be considered by our team through research grant applications and inter-varsity collaborations. We have also sought financial aid from the state government in hopes that we can afford to buy the needed software that costs nearly EUR 500 for a single user license.
With regards to awards and recognitions, as described in the prior section our university’s Academic Affairs Division has selected this project to initiate the implementation of IR40 and EDU40 learning delivery systems for 2019-2020, and beyond. Simultaneously, this initiative is due for cooperation between our campus, Indonesia’s Open University (Universitas Terbuka Indonesia) and MARA Junior Science College (Maktab Rendah Sains MARA) iGCSE Kuala Kubu Bharu, Selangor. In August 2019, the ELSA 360°-Videos project received its highest recognition so far as the most outstanding language learning innovation project within the UiTM system at the My_CASELT International Conference and LIID Innovation Competition in the state of Sabah, Malaysia. ELSA 360°-Videos then started receiving wide mass media coverage in the local Borneo Post newspaper and followed by Malaysian national newspapers like ‘Sinar Harian’, ‘Harian Metro’ and most recently in the ‘Sunday Star’ newspaper, as outlined in chronological order below:

**Borneo Post** (2019, August 24)
*UiTM Negeri Sembilan & UiTM Perak topped the 6th My_CASELT and 3rd LIID Exposition Contests*

**Sinar Harian** (2019, August 30)
*Inovasi maya pembelajaran Bahasa Inggeris - Kampus Uols*

**Harian Metro** (2019, September 9)
*Bestari - Inovasi siri video maya*

**Sunday Star** (2019, September 15)
*Education - Teaching English goes future forward*

Realising that the future of university education will consist of even more interactive and immersive educational experiences (see Mustafa Kamal, Adnan, A. Yusof, Ahmad & Mohd Kamal, 2019), it is hoped that the ELSA 360°-Videos project will be able to win more accolades and secure some financing in the near future. This would permit us to develop better 360° or spherical videos content with higher ‘production values’ that could readily be commercialised and even go beyond English language teaching and learning.
7. CONCLUSIONS

The benefits of 360° or spherical videos in the delivery of language learning content were already noticeable even from the early stages of the ELSA 360°-Videos project, in the beginning of 2019. Amongst the benefits for end users include being able to see eye contact between all the interlocutors who are acting in the video clips and getting to learn about professional mannerisms, for instance how to interrupt during formal conversations from observing the entire meeting room situation. This is a crucial element for a learner to master in the topic of business communication and other related fields such as public oration and giving presentations. The learners or end users will also be able to comprehend the significance of physical gestures and facial expressions during professional communication; this will later help them to communicate more effectively and professionally in the workplace as the experience of being immersed in 360° or spherical videos is similar to the actual scenario (Adnan, Ahmad, A. Yusof, Mohd Kamal & Mustafa Kamal, 2019).
Fig. 8 Coverage of the ELSA 360°-Videos project in the *The Star* national newspaper, September 15, 2019
At the same time, there are more than a few difficulties to face before Malaysian tertiary educators can adopt this technology more widely within Malaysian higher education (notwithstanding Internet connectivity problems and the relatively high cost of mobile data access for university and college students who do not have constant access to their campus' wi-fi network). These challenges need to be addressed as soon as possible to create a better environment for technologically enhanced learning experiences (A. Yusof, Adnan, Mustafa Kamal, Mohd Kamal & Ahmad, 2019). The biggest challenge for content developers is finance, given the expensive price to buy and use state-of-the-art 360° or spherical video development software and to upload finished products to Internet-based VR deployment platforms. The next challenge is technical whereby content developers must be able to learn about 360° or spherical video technology from the beginning and proceed to upskill themselves with fast changes in this technological field. The final challenge is to improve the content creation in 360° or spherical videos so that they are both highly immersive but very interactive for end users.

Without question, creating interactive educational content is paramount to grab the attention of today’s learners whose attention span is easily dissolved into thin air. If we keep on forcing them to learn using the traditional style such as teacher led 'chalk-and-talk', reading from dry textbooks and keeping teachers as the centre of the class, we are doing these undergraduates a disservice in the long run. The ability to grab learners' attention will result in real learning and knowledge acquisition. Once these challenges are met head-on, only then can we expect Malaysian educators to be able to develop 360° or spherical educational videos with high production, and maybe even resale, value.

8. ACKNOWLEDGEMENT

This is a revised and expanded version of a short book chapter entitled – English Language Simulations Augmented with 360-degrees spherical videos (ELSA 360°-Videos): ‘Virtual Reality’ real life learning! – published by MNNF Publisher in April 2019 in conjunction with InIIC 1/2019 held in Melaka, Malaysia.

REFERENCES


