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Education 4.0 Technologies, Industry 4.0 Skills and the Teaching of English in Malaysian Tertiary Education

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Abstract
Unprecedented changes are happening in the way the world works; traditional jobs are being replaced by new ones that need critical skills for workers of the future. Enter the era of 'Industry 4.0'. In this era, knowledge and skills are paramount for one to stay relevant and remain competitive in the job market. Terms like 'reskilling' and 'upskilling' reflect the kind of changes that are happening. Thus, it is only natural that the realm of education follows suit, with the construct of 'Education 4.0'. This research article takes a broadly neutral view of Industry 4.0 and Education 4.0, although both constructs are criticized by certain quarters. In truth, the increasing automation of manual labor and remarkable growth in and expansion of technological developments, all point to an uncertain future for the next generation of future workers. Strategies must be drafted, and initiatives be taken, to ensure young people are not disadvantaged in the near future. This article examines the struggles of a small group of English educators at Malaysian public universities, who are frantically trying to apply Education 4.0 learning technologies to teach this international language to Malaysian students, based on three core research questions. Handicapped with little to no budget, limited technical expertise and no institutional assistance, and facing resistance from traditional educators, the 'thick' qualitative descriptions and stories shared by these educators cum learning technologists provide a glimpse into the realities of English teaching and learning at a time of 'disruptions' linked to Industry 4.0 and Education 4.0.

***Keywords**:* Education 4.0, Industry 4.0, learning skills, learning technologies, Malaysia, tertiary education
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Introduction

Given that post-secondary or tertiary education is critical to national progress, it is only apt that the curriculum of colleges and universities be catered towards the needs of undergraduates who must face the challenges of the real world and 'Industry 4.0' (Ehlers & Kellermann, 2019; Schwab & Davis, 2018). Tertiary curriculum must also be innovative and relevant, both at the technological and personal levels (Adnan, 2018; Araya, 2015). Technological developments from different fields, must be brought into lecture rooms while taking into account the learning preferences of the current generation (Doucet, Evers, Guerra, Lopez, Soskil & Timmers, 2018); what was useful 10 or 20 years ago might not be relevant in the here and now, what more with rapid developments in technologies of teaching and learning (Adnan & Zamari, 2012a, 2012b). Simply put, the ways that 'Gen X' tertiary educators (born between 1965-1979) learn are now irrelevant to 'Gen Z' undergraduates (born between 1995-2015). The younger generation was born into technology and they need technology to make sense of the world. The critical question that needs to be asked is, do their (old) educators understand this and are they able to apply relevant technologies in the post-secondary/tertiary educational context?

This question must be answered by English educators working in tertiary colleges and universities. While English teaching focuses on the development of the four skills of listening and speaking, reading and writing (see Adnan, 2014; Adnan & Abdullah, 2014), this does not mean that learning methods of the past can cater to the learning styles of the present generation. The 'chalk and talk' approach, for example, might be unproductive for the teaching of English especially when better alternatives are now present that make learners more invested in their learning. 'Education 4.0' technological advances are indeed opening up opportunities for learning, anytime and anywhere (Adnan, Ahmad, Yusof, Mohd Kamal & Mustafa Kamal, 2019). This research article is an effort to highlight these issues, focusing on English language educators working at Malaysian public universities. The ability of young future workers to communicate through the English language as a lingua franca is not just added value to their professional repertoire, it is increasingly becoming a necessity when cross-boundary collaborations across space and time zones are now common. But, are English educators ready to face these challenges and become not just teachers but also content developers and learning technologists?

Industry 4.0 and critical skills for future jobs

Schwab (2016) in his ground-breaking book on the 4th Industrial Revolution, highlights not just the problems that the next industrial revolution might give rise to but also the opportunities that it might bring as technological developments start to combine and interweave with physical realities, biological systems and digital innovations. He explains, "Aside from speed and breadth, the fourth industrial revolution is unique because of the growing harmonization and integration of so many different disciplines and discoveries" (p. 15). For the person on the street, the easiest way to make sense of what is happening is by looking for patterns of 'disruptions' in established norms and society-related systems (Gleason, 2018). Yet, disruptions brought by the 4th Industrial Revolution also bring opportunities for growth that need to be managed so that Industry 4.0 does not increase the traditional chasms between developed and less developed nations and exacerbate the differences between the rich and the poor. As Schwab (2016) puts it:

> The reality of disruption and the inevitability of the impact it will have on us does not mean that we are powerless in face of it. It is our responsibility to ensure that we establish a set of common values to drive policy choices and to enact the changes that will make the fourth industrial revolution an opportunity for all. (p. 17)

For the younger generation to be part of this movement and to gain better opportunities for themselves, the World Economic Forum's 'The Future of Jobs' report in 2016 (and in 2018) outlined ten critical skills for the world of work for 2020 and beyond. The following two paragraphs review these skills.

The first critical skill for Industry 4.0 is complex problem solving. Future careers will require some sort of complex problem-solving skills. To solve complex problems, a worker must be able to quickly switch from one group of skills to the other and back again. The second critical skill is critical thinking. Critical thinking is the ability to think logically and rationally about what needs to be done or what needs to be believed. It also includes the ability to engage in reflective and independent thinking while trying to see logical links between ideas. The third critical skill for the workplace of the future is creativity. Creativity is the tendency to generate or recognize ideas or alternatives that may be useful in solving different problems. The fourth critical skill to face the challenges of Industry 4.0 is people management. People management or people skills is important so that a worker can relate to others and understand other points of views. The fifth critical skill is coordinating with others. Coordinating to work with others means to arrange the workflow to execute a task and to aid in achieving collective effort. Coordinating includes attending to several tasks instantaneously or multitasking.

The sixth critical skill for the workplace of the future is emotional intelligence. Emotional intelligence is the ability to know and manage one's emotions to relieve anxiety, communicate, empathize, tackle problems and handle conflicts. Most 'soft skills' are directly associated with emotional intelligence. The seventh critical skill is judgment and decision making. Judgment is the ability to make logical conclusions and measured decisions. Judging and then deciding on something goes hand in hand but both need practice and experience. The eighth critical skill for the future of work is service orientation. Service orientation refers to personality traits and a worker's aptitude to be helpful, thoughtful and co-operative with others. Some people possess these traits naturally, but most do not. The ninth critical skill for the Industry 4.0 era is negotiation. To negotiate requires strong interpersonal and communication skills to bring desired results for two or more parties (i.e., win-win situations). The tenth and final critical skill for the workplace of the future is cognitive flexibility. This is the ability to switch between different personas or roles, between thinking about non-connecting concepts, and thinking about many dissimilar concepts all at once.

Most interestingly, many, if not all the skills mentioned in the paragraphs above will involve language as an intermediary or mediating factor (see Davies, Fidler & Gorbis, 2011). Linking this back to the introduction section, it is possible to argue that a common international language like English will play a crucial role in interweaving the ten critical skills for Industry 4.0. Tertiary students cannot do without English and they need English not just as an added skill in

their professional repertoire but more importantly, to access the critical skills needed to look for, and to secure, jobs of the future.

Education 4.0 and the future of learning

If English language is placed at the core of the ten critical skills for Industry 4.0, then it is only logical that the teaching and learning of English must follow the design of future curriculums and be in line with the broad aims and objectives of Education 4.0 (see Ahmad, Adnan, Azamri, Idris, Norafand & Ishak, 2019; Rüfenacht, 2017). This section reviews the concept of Education 4.0 and the future of learning from several sources. In the United Kingdom, Education 4.0 is viewed as a set of trends and challenges as below (see Times Higher Education, 2019). The first trend is the transformation of teaching. Human educators need to rethink why and how they teach once Artificial Intelligence (AI) and other deep thinking technologies become more common in tertiary education. The second trend is personalized learning. Tertiary educators must be able to cater to the learning styles of individual students and consider their diverse behaviors, differences, and performances. The next trend is personalized assessment. As AI systems run tests, experiential learning through digital technologies and the advent of so-called 'micro-credentials' will become the norm. Tertiary educators must be ready to do without high stakes pen-and-paper tests. The final trend is the growth in intelligent digital environments. As these environments become more prevalent in physical classrooms, tertiary students need better experiences to be able to interact effectively and learn from and within those environments (see Mustafa Kamal, Adnan, Yusof, Ahmad & Mohd Kamal, 2019).

Fisk (2017) also talks about nine education trends that will demarcate the Education 4.0 movement from the earlier education movements in the post-Industrial Revolution era. The first trend that Fisk observes is diversity in learning opportunities whereby "students will have more opportunities to learn at different times in different places" (2017, online). As a result, more lessons will be 'flipped' where theoretical learning happens outside of the classroom while practical learning and testing happens in class (see Martin, 2011). The second trend is more personalized learning that will adapt to the personal needs of learners. This is useful for weaker students, who "will get the opportunity to practice more until they reach the required level" (Fisk, 2017, online). Compare this with traditional learning that teaches 'to the middle' of the class and ignores the needs of higher potential and lower ability students. The third trend is a free choice in choosing how to learn. Students "will be able to modify their learning with tools they feel are necessary" (Fisk, 2017, online). Learning technologies will allow for a multitude of gadgets, platforms, and techniques to be used based on the learning styles and preferences of learners (see Mohd Kamal, Adnan, Mustafa Kamal, Ahmad & Yusof, 2019). The fourth trend of Education 4.0 is a movement towards project-based curriculums. Project-based learning centers on students and allows them to acquire knowledge through the exploration of 'real' challenges in different spheres of life from industry to community.

The fifth trend is gaining experience from the field. As learning technologies become more common and learning becomes more natural, learners need to deal with real challenges in the field rather than learning based on theories. The sixth trend is data interpretation. As computers and AI systems become more adept at solving difficult problems, the roles of human workers become even more critical as data analysts, not just to make sense of the present but also to deduce future

trends that will affect human life. The seventh trend for Education 4.0 is a change in testing and evaluation. Tests and exams of the past are nothing more than an exercise in memorizing facts and figures, and then regurgitating them. In line with the critical skills for Industry 4.0, the application of learners' knowledge "is best tested when they work on projects in the field" (Fisk, 2017, online). The eighth trend is student ownership in the process of formal learning. Educators must constantly gain input from their learners, not just political or industrial figures and parents. The younger generation must be given the space to become significant stakeholders in education signaling a revamp of the social functions of education in the past 20 years (Adnan & Smith, 2001). The ninth trend for Education 4.0 is that the process of mentoring will become even more imperative for educational success. The role of the educator as the 'master' of knowledge must be changed to that of facilitator and mentor, someone who guides learners on their journey of knowledge.

Some of these trends are already appearing in the education systems of developed nations (see Adnan, Ahmad, Mohd Kamal, Mustafa Kamal, A. M. Yusof & Azamri, 2019; Karim, Abu, Adnan & Suhandoko, 2018). But what about the rest of the world, like in Malaysia? Just because Industry 4.0 and Education 4.0 are bringing never-before-seen changes, are educators in developing nations ready to embrace them, and more importantly, to become learning technologists instead of traditional teachers? In the teaching and learning of English, which is the core concern of this article, are changes brought by Industry 4.0 and the technologies of Education 4.0 being applied in lecture rooms of Malaysian tertiary institutions? The next section addresses these concerns.

Research participants, data collection and analysis

Based on the research literature reviewed in the previous sections, an empirical inquiry was carried out for about nine months from January to September 2019 to examine what is actually happening on the ground, with reference to English language teaching and learning in the era of Industry 4.0 and with the availability of Education 4.0 learning technologies in Malaysia. As discussed earlier, unprecedented changes are happening not just in the way students are learning but more importantly, in the way that teachers *should* be teaching. There is a clear gap in the literature between both spectrums (see Yusof, Adnan, Mustafa Kamal, Mohd Kamal & Ahmad, 2019). To explore this gap, three research questions guided this empirical effort, as below.

First, how are English educators at Malaysian public universities applying Education 4.0 learning technologies to the teaching and learning dyad?
Second, what difficulties are English educators at Malaysian public universities facing in applying Education 4.0 learning technologies to the language teaching and learning process?
Third, why are some English educators at Malaysian public universities struggling hard to apply Education 4.0 learning technologies to their instructions? What drives them to do what they do?

The participants of this qualitative empirical inquiry

To answer the research questions, this study examined the lived experiences and daily struggles of 19 English language educators working at three Malaysian public universities who are actively involved in Education 4.0 learning technologies projects. These English educators were invited in January 2019 to participate in this study, based on distinct criteria for participant selection. First, their Education 4.0 learning technologies projects must be directly related to the

teaching of English in the Malaysian context and must involve the use of novel technological tools and methods. Second, their Education 4.0 projects must be innovations that have competed, are competing, and will continue to compete in international level teaching and learning innovation competitions. Their projects must also have won at least three different prizes in three different competitions and/or categories. Third, their Education 4.0 projects must be funded from their own pockets and they must not be financially backed by their tertiary institutions or other direct funders. Finally, the Education 4.0 learning technologies of the research participants must be recognized at the national or international level through electronic and/or print media coverage, as a testament to the innovativeness and novelties of these projects.

Based on these stringent criteria, three Education 4.0 learning technologies projects and their respective team members were invited to take part in this study. The first team/project applies virtual reality (VR) technology to teach English for Business, helping degree students at their campus in northern Peninsular Malaysia 'experience' business-related situations and tasks, anytime and anywhere. 'Team Virtual Reality' is led by a 43-year-old English educator and his team is made up of two smaller teams with four members in each sub-team (nine team members in all). Two of the team members are female and the rest are male, the average age of the group is 29 years. The second team/project uses smartphones and mobile technologies to teach English for Writing. This team uses mobile technology to teach the skill of writing using animated mind maps and 'writing trees' so that diploma level students at their campus in central Peninsular Malaysia can never run out of ideas on how and what to write. 'Team Mobile Learning' is led by a 38-year-old English educator with four younger members in that team. This all-female team averages 30 years in age. The third and last team/project makes use of a chatbot program to train diploma level students to respond to text conversations as a metacognitive technique to encourage students at their campus in central Peninsular Malaysia to start thinking and developing ideas to speak in English. 'Team Chatbot Program' is led by a 34-year-old English educator with four more team members. This all-male team averages 31 years in age.

The qualitative data collection and analysis process

Qualitative data were collected using two instruments, focus group discussions (Ho, 2006) and from continuous online discussions within a closed 'Telegram' group (Kozinets, 2015). Preliminary work started in January 2019 with the participants' selection process and ended in mid-February. Once data disclosure forms were signed and the participants agreed to share ideas and opinions freely with each other, a Telegram group was set up. Telegram is a cloud-based instantaneous messaging app that is accessible through multiple platforms such as Google Android and Apple iOS. In the following months, two focus group discussion sessions were held with each Education 4.0 learning technologies team at their convenience. These sessions were held informally, outside of campus to avoid problems of access. The sessions were held even if only two participants could attend. This is a common dilemma when it comes to carrying out focus group discussions. To protect the identities of the participants, pseudonyms are used instead of real names in this research article, and all other identifying details are removed to adhere to international standards in research ethics.

The focus group discussion data were then selectively transcribed, and a summary shared for 'member checking' (Chapelle & Duff, 2003). No clear-cut interview protocols were prepared,

and the participants were given the chance to comment and share their experiences freely. Sessions were conducted both in English and Malay, as informally as possible. At the end of the data collection process somewhere around August 2019, six discussion sessions were completed together with streams of online discussions from the app group. This massive collection of textual data are the 'thick' (Geertz, 1973) data record the researchers co-constructed with the participants. After transcribing and coding, the data were thematically analyzed in two stages, namely horizontal (group or collective data) and vertical (personal or individual data). Results of a broad thematic analysis of the data (Chapelle & Duff, 2003; Lincoln & Guba, 1985) addressed the three research questions that guide this study. The controlled and disciplined process of data collection and analysis in this study significantly improved the *quality* of qualitative data, in tune with Lincoln and Guba's (2000) notion of research 'trustworthiness'.

Presentation and analysis of the qualitative data

Empirical data in this section are organized based on the experiences and stories shared by the three English language-related Education 4.0 learning technologies teams. The data presented are also linked to the three research questions that guide this study. The research questions deal with how English educators at Malaysian public universities apply Education 4.0 technologies for the teaching and learning of English; the complications and hitches they face in their continuing endeavors to use Education 4.0 technologies to teach English; and finally, the real reasons why they strive to use Education 4.0 technologies to teach English, and what drives them to continue their efforts even when they face stumbling blocks in their journey.

Education 4.0 learning technologies and the hard work of 'Team Virtual Reality'

'Dr. Ellmi' who heads Team Virtual Reality describes himself as "a dreamer who tries to deal with real-life issues." It so happens that the biggest issue that he faces as a university educator is the limited time given to teaching English to his degree level students. He laments during the first focus group discussion (FGD) session with his team members:

> Ten years ago, we had six hours to teach one English code per week. It was tiring but the learning was bloody meaningful. Students had so much exposure that they had no choice but to learn the language. Now, we're left with two measly hours each week to teach advanced English skills. You tell me then, what the hell can you teach in two hours?

But Dr. Ellmi did not take things lying down. Frustrated with the short time given to teach business and professional English skills, he quickly turned to technologies of learning. "I'm such a nerd and a bit of a techno-geek," he confesses. Having the experience as a learning technologist working at two international universities helped too, as he searched for ways in which English exposure could be increased even with the limited classroom time. He explains, "I'm also a gamer just not so good. One thing I learned from PC gaming is the importance of immersive experiences to enhance our gaming skills. I started thinking, what if the same immersiveness is applied to language learning?"

After many months mulling over the idea of applying immersive gaming principles to English language teaching and learning, Dr. Ellmi started to reskill and upskill himself with knowledge related to virtual realities (see 3DLabs, 2019; AdvancED, 2015, Aniwaa, 2019). In late 2018, he saved some money to purchase a 360-degrees spherical video camera online and he

started experimenting with 360-degrees audio-visual technology to simulate, record and share business and professional English interactions and meetings with his students. 'Kay Jungkook' his right-hand man explains (FGD session #2):

> The problem with the Dr. is that his brain thinks way too fast for us. When he first asked us to join his Education 4.0 team last year, we had no idea what he was really rambling about [laughs]. But within this one year, our team has done so much. We even won some awards, and most importantly, we can see the students are benefitting from our hard work so far.

'Cute Girl', the only female lecturer in the original Team Virtual Reality, is fully invested in the work that they are doing. However, in the Telegram group she explains, "The truth is we face so many technical challenges. So many! Especially when you deal with new technology. Many times, we had to redo the VR videoing because something went wrong somewhere."

The "VR videoing" she mentioned is just one part of the long process to create useful immersive experiences to teach and learn English. Team Virtual Reality spent many weeks to write acting scripts and to perfect their business and professional English simulations. Then, comes the process of actual videoing followed by rendering and lengthy post-production. Money is also an issue and, up to the point of writing, the team had invested a lot of their own in this project. The proposals they sent to several government-linked companies have so far been ignored or outright rejected. As 'Anuvar' one of the team members describes in Telegram, "For me, I think what we're doing is too advanced. People around us don't even understand what we're trying to do for the students. Well, we must do this for the new generation students, right?" In the final FGD session, Dr. Ellmi shares his point of view:

> Are we doing the right thing? Of course, we are. Will we face problems? Definitely we will. Bringing change into our traditional [education] system is hard. Money won't be enough, and the technical problems won't go away. But I always remind the team, we're doing this for our own students. They're born into technology, so we must take advantage of this. As the students learn about English, we're learning about new technologies. In the end, what really matters is the actions we take now to bring real changes to the system. I refuse to become a dinosaur lecturer… we should be like the guys in Ready Player One.

Education 4.0 learning technologies and the struggles of 'Team Mobile Learning'

'Dr. Raudah' is the leader of Team Mobile Learning, a group of lecturers who are trying hard to promote the use of mobile technology to teach the skill of writing. In the Malaysian setting, teaching the art of academic writing at university is no easy task given the fact that English is only a second language within the education system. Furthermore, as she explains in the team's first FGD:

> The biggest problem you face when you want to teach English writing is that it's too dry. I mean, the skill is so dry and so boring. You can't blame students if they hate writing. But look, our lecturers still teach writing the way their grandparents are taught [laughs]. Our team is trying to bring English writing to the 21st century.

Using smartphones loaded with animated mind maps and so-called electronic writing 'trees' (see Massa, 2019), Dr. Raudah and her team members have been hard at work promoting these technologically enhanced methods to their own diploma students and also to other Malaysian tertiary institutions, for example, local polytechnics and community colleges. "The technology is already there. These apps are free and can be loaded onto your phone with just a few taps. Why is it so hard for English lecturers to teach writing using these Education 4.0 methods?" she laments.

'Che Hafizah', one of her team members explains in the Telegram group: "I think the reason why our method is slow for other lecturers to pick up is because they're in the comfort zone. Also, maybe they believe that copying from the whiteboard is the supreme method to teach writing." Her opinion is shared by another member of Team Mobile Learning, 'Serina'. She had this to say in the second FGD:

> What I see is that my colleagues, especially the old senior ones, they can't live without whiteboards [laughs]. Yes, they do use PowerPoint slides too. But how can you teach English writing like that? You think students care or not? When me and my friends teach writing using apps, mind maps and electronic diagrams, our students are so amazed. Why? Because they never thought learning to write in English can be interesting and not impossible to master.

Indeed, the main target of this Education 4.0 learning technology team is to teach university students that they can never run out of ideas on how and what to write, if they are able to use technological aids that they downloaded onto their smartphones. In addition, smartphones now are so common and affordable that it is rare for a Malaysian university student not to have access to this gadget on a day-to-day basis.

"Our challenge now is to develop our own app, because we just use other people's app and adapt to our teaching. For me, we're adopters and not innovators. I want to learn to become an educational innovator," writes 'Azrawatie' another member of Team Mobile Learning in the Telegram group. The members of this Education 4.0 learning technology team feel that the time is ripe for more educators to join them and apply advanced technology in English teaching and learning. Like what Team Virtual Reality found out, the younger generation is more than ready and they welcome technology in the teaching and learning process. "One of my diploma students said to me: 'Miss, finally you can teach English like how we want to learn'. What that boy said to me really struck me hard. If only other lecturers would listen," Azrawatie adds.

Education 4.0 learning technologies and the efforts of 'Team Chatbot Program'

Whereas the leaders of the two other teams are Education studies and English language experts by training, the leader of Team Chatbot Program, 'Dr. Zidkri', started his academic career with a degree in computer programming. It was only after that, that he decided to take up English teaching. After having recently completed his doctoral degree in TESOL and technology-enhanced learning environments, he decided to focus on another Industry 4.0 and Education 4.0 technological revolution: Chatbots. A chatbot is an AI software that can simulate a discussion (i.e., a chat) with a human user in natural language through messaging applications, mobile apps and

other electronic platforms (see Onlim, 2017).

"The challenge is to design a program that can mimic human conversations. For the first time with AI, big data and natural language processing easily accessible, the future is really promising," Dr. Zidkri explains during the first FGD with his team members. He continues:

> My team, we focus on chatbots because not many lecturers are looking into chatbot development. Maybe they think it's too technical? But even with my IT training, I had to reskill myself on my own, my team members too […] Our chatbot works on the metacognitive level. We want to help students to become good [English] language learners. So, to begin, they must start thinking in English. Our chatbot, 'Little Shakespeare', focuses on that. The bot chats with students about 1001 things related to English in an informal, engaging and fun way. Well that's the target anyway [laughs].

"We're lucky that we have Dr. Zed. He takes on all the coding and backend software work. We help too but we focus more on textual corpus. Our target is to add in more nuances and natural Malaysian English," 'Shahrel' a member of Team Chatbot Program explains in the second FGD. Much of their development effort is focused on the process of code testing followed by deployment, and to make sure that students are aware of the advantages of using a chatbot in learning the English language.

Shahrel adds, "So far responses have been awesome. Tell me, which student doesn't know Siri or Alexa? By the way, that's our next target, to incorporate voice recognition. But no one is willing to give us money to start this." What Shahrel mentioned is a common stumbling block for Education 4.0 learning technologists in the Malaysian tertiary education setting. Other than having to do all the content development and lengthy technical work on their own without support from anyone, funds are also basically non-existent to back their positive efforts either from their universities, state governments and even the Malaysian Ministry of Education. Hence, what 'Yusrie', another member of Team Chatbot Program, shared with the Telegram group is heartfelt by all:

> If we don't do what we do, then who are we waiting for? The *Mat Salleh* and *Minah Salleh* [Europeans and Americans], is it? We talk about education for change but us lecturers we teach like in the Jurassic period. How will our students learn? And this is Malaysia, no one will support us… unless you know somebody who's somebody. All the political people talk about Industry 4.0, Education 4.0 like they know it when they really don't understand nothing. For myself, this is our sacrifice, our *Jihad* for knowledge. And, we do this for the students. We owe it to them, to teach them to prepare for the fuzzy future in front of them!

Conclusion

"*We do this for the students*," practically sums up the primary reason why some English educators in Malaysian public universities are working hard, as fast as they could, to apply Education 4.0 learning technologies to the teaching and learning dyad. The challenges and difficulties they face are perhaps not alien to change agents and technological trailblazers of the past: Feeling alienated, not getting any support, and not having access to resources and desperately

needed funds. At the same time, the eyes and minds of these educators are wide open to the need for applying learning technologies at such a critical time in human history; the disruptions and uncertainties brought by Industry 4.0 are real, and they are already happening whether we are ready to face them or not.

The experiences and stories shared by members of Team Virtual Reality, Team Mobile Learning and Team Chatbot Program clearly show that all of them understand the necessity to develop and use Education 4.0 technologies for the teaching and learning of English. Even though the three teams face challenges and difficulties in taking their work to the next level, and in trying to expand and share their efforts with other educators in Malaysia, it is heartening to see that they are not giving up on their journeys. What will be even more encouraging is to see more educators who understand that they need to deploy Education 4.0 technologies in the teaching and learning process, even with a slow pace. Truth be told, the reality in dealing with technology is we cannot move slowly not when technology is developing rapidly. As Facebook founder Mark Zuckerberg exclaims, thinkers and innovators need to "move fast and break things" (Taplin, 2017, p.3). This is exactly what the three English-focused Education 4.0 learning technologies teams are doing now, for Malaysia.

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