

Entrepreneurship Education: Impact on Knowledge and Skills on University Students in Malaysia

Wardah Mustafa Din^{1,*}, Wahiza Wahi¹, Wan Mimi Diyana Wan Zaki², Rosilah Hassan³

¹Pusat Citra Universiti, The National University of Malaysia (UKM), Malaysia

²Faculty of Engineering and Built Environment, The National University of Malaysia (UKM), Malaysia

³Faculty of Information Science and Technology, The National University of Malaysia (UKM), Malaysia

Received May 31, 2020; Revised July 10, 2020; Accepted August 10, 2020

Cite This Paper in the following Citation Styles

(a): [1] Wardah Mustafa Din, Wahiza Wahi, Wan Mimi Diyana Wan Zaki, Rosilah Hassan, "Entrepreneurship Education: Impact on Knowledge and Skills on University Students in Malaysia," *Universal Journal of Educational Research*, Vol. 8, No. 9, pp. 4294-4302, 2020. DOI: 10.13189/ujer.2020.080956.

(b): Wardah Mustafa Din, Wahiza Wahi, Wan Mimi Diyana Wan Zaki, Rosilah Hassan (2020). *Entrepreneurship Education: Impact on Knowledge and Skills on University Students in Malaysia*. *Universal Journal of Educational Research*, 8(9), 4294-4302. DOI: 10.13189/ujer.2020.080956.

Copyright©2020 by authors, all rights reserved. Authors agree that this article remains permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

Abstract Entrepreneurship Education is deemed as an essential element in Malaysia's quest to become a high income developed country. In doing so, the Ministry of Education has given emphasis on developing holistic, entrepreneurial and balanced graduates as one of the ten Key Focus Areas in the Malaysian Education Blueprint 2015-2025 for Higher Education. Hence, Entrepreneurship Education (EE) is made as a compulsory subject for undergraduates in The National University of Malaysia (UKM). New approaches and technologies are incorporated into the teaching and learning of EE in line with digitalization of learning. This paper reports on the effectiveness of the teaching and learning approach in EE course towards the knowledge and skills of the undergraduates. A pre and a post survey were distributed to the same set of students (n=1350), before the execution of the course and upon its completion. A paired-sample T test was done on the pre and post-test using SPSS. The analysis points out that there is no significant knowledge acquired by the students. However, there is a significant improvement of entrepreneurial skills which incorporate business ideation, marketing, sales and cash flow, and project management. The findings suggest that the new teaching and learning approaches are effective to enhance entrepreneurial skills among undergraduates. This should be a basis to further explore and improve the way EE is taught in UKM, so that both knowledge and skills can be gained by undergraduates, and thus producing

entrepreneurial graduates as envisioned in the Malaysian Education Blueprint.

Keywords Entrepreneurship Education, Skills, Knowledge, 4IR

1. Introduction

Entrepreneurship Education is deemed essential in Malaysia's quest to become a high income developed country. The Ministry of Education has highlighted 10 Key Focus Areas in the Malaysian Education Blueprint 2015-2025 for Higher Education. The first key focus area is developing holistic, entrepreneurial and balanced graduates. The development of Entrepreneurship Education (EE) in Malaysia has gained ground in the last decade to empower the nation towards becoming a high income developed country. Numerous government mechanisms and policies have emerged including funding, physical infrastructure, trade advisory and other support systems to address the challenges faced in educating potential entrepreneurs. In line with the effort to increase the number of entrepreneurs in Malaysia, many higher learning institutions in Malaysia have begun to offer formal EE as envisaged in the Malaysian Education Blueprint 2015-2025 in the transformation of the higher education

system [1].

Furthermore, with the idea of the Fourth Industrial Revolution (4IR) looming ahead in the global and national context which embraces digital technology and its advancement, entrepreneurial education needs to be redefined to meet essential skills befitting the impacts of the said revolution. It is crucial for the education sector to keep up with the demands and needs of the 4IR. As such, this requires adjustments to existing programs to prepare for new roles and to ensure new entrepreneurs are equipped with necessary skills to utilize the revolution as a platform of opportunity for a new business model, thus Malaysian government's role is ever pertinent to boost existing policies and educational curriculum in entrepreneurial education along the lines of National Transformation 2050 (TN50) and Education 4.0 Framework to adapt to changes brought about by the 4IR.

However, one of the main challenge encountered by most higher learning institutions in Malaysia is to provide EE to non-business disciplines. Hynes [2] states that the objectives in an entrepreneurial learning module should be designed according to the needs of the students, including content focus, teaching focus, skills building methods and discovery methods. Students with diverse background is evidenced in UKM as it offers entrepreneurial courses to multidiscipline undergraduates. These courses cover the needs of students across all levels of studies, starting from the first year up to the final year. EE is made compulsory to all first year students at the University as EE forms the foundation to other related entrepreneurial courses [3].

In terms of the pedagogical approach, besides the conventional way of teaching such as lectures, group presentations, and discussions, there are other innovative approaches to improve the quality of teaching and learning. This paper elaborates on the current approaches of teaching and learning of EE in UKM and its impact on the students' knowledge and skills. This research is important in assessing the quality of teaching and learning of EE which aims to produce future knowledgeable and skillful entrepreneurs.

2. Connectivism Theory in Entrepreneurship Education

The learning objectives of the EE are designed suited for multidiscipline undergraduates. The curriculum includes concepts and theories related to entrepreneurship, team building and leadership, strategy and management, marketing and market research, finance, and manufacturing or production. Students will apply the link between various business components taught in the course individually and in groups and also conduct discussions and presentation of a business plan. The learning outcomes for the course are:

1) To explain the basic concepts of entrepreneurship

- 2) To elaborate creative and innovative strategies of entrepreneurship.
- 3) To draft and discuss a business plan

By embedding this curriculum in the higher learning institutions, it is able to nurture the entrepreneurial mindset and values among undergraduates. Although there is a possibility that not all students will end up being entrepreneurs, the input offered by the course will help to prepare them for the workplace. Moreover, the attitude and mind-set taught in the course would be crucial for the students to help them participate in various aspects of work environment. Indeed, entrepreneurial intelligence is one of the fourth industrial revolution intelligence crucial for leadership as indicated by [4].

Higher learning institutions in Malaysia including UKM, have restructured their curriculum delivery of most courses to meet the National Policy on 4IR, and equip graduates with a digital set of skills that makes them relevant in the workplace [5]. The framework that captures the new approaches of teaching and learning is the connectivism theory from Reference [6] which explains that "Internet technologies have created new opportunities for people to learn and share information across the World Wide Web and among themselves". Connectivism theory is a pivotal philosophy that grasps the digital approaches whereby lecturers and teachers act as facilitators, as students self-explore information in the internet pertaining to a specific subject. A review about EE by [7] states that in inculcating entrepreneurship competencies among students, both experiential learning theory and connectivism should be implemented in teaching materials and approaches to make EE relevant to the students. Hence, this study implies the connectivism theory as the framework of the current EE approaches in UKM.

2.1. Digital Approaches in Teaching and Learning of Entrepreneurial Education in UKM

ICT is an advanced term for information technology (IT) which emphasize the roles of unified communications and the integration of telecommunications that enable users to access, store, transmit, and manipulate information. Reference [8] explicate that ICT refers to technologies that provide access to information through communications. It is undeniable that the development of ICT has brought along some impacts to the quality and quantity of teaching, learning and research in conventional and distance educational institutions [9]. ICT provides the platform for students to communicate with each other via email with a fast and easy access to more extensive and current information. Furthermore, ICT can make teaching and learning process more efficient and productive, with the development of various tools to enhance and facilitate teacher professional activities during class [10]. Figure 1 illustrates the components of teaching and learning of EE in UKM.

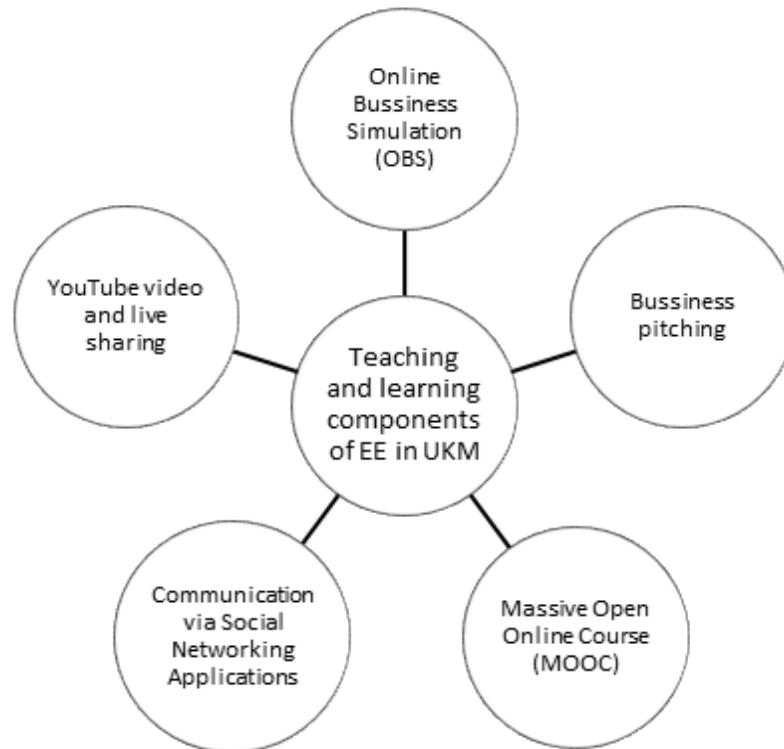


Figure 1. Components of teaching and learning of EE in UKM

2.1.1. Online Business Simulation

Online Business Simulations (OBS) serves as a learning platform that stimulates “gaming” interest amongst students. This provides a structured learning environment given that it is one of the best ways to train students to understand the process in doing business. This also supports the approach to encourage active participation amongst students in which they learn by doing business activities [11].

This simulation game helps students to understand the real world of business and teach them to make decisions that involve business life. Through this simulation game exposure, students can think creatively and critically to solve the problems they encountered in the business area and dare to take the risks in making decision. Moreover, the simulation also helps to enhance entrepreneurship skills among the students [12]. In a research conducted on gamification of beef-cattle breeding, it is discovered that 50% of the students reported that their motivation and engagement had increased through the learning approach as compared to the traditional one. This points to the increased benefits of learning through gamification and simulation techniques in comparison to the conventional methods [13].

Business simulation in UKM is based on the collaboration with US business simulation [14]. This is a new step taken by UKM to improve new teaching technique using business simulation as a tool for education. In 2014, a total of 3,129 students took part in the business simulation game. Some of the key advantages of OBS as

described in various fields are presented below:

- Simulations provide a safe environment for making mistakes [15].
- Simulations allow learning to occur without attracting expensive offline equipment.
- Creating a simulation can help to streamline the processes that are being taught.
- Well-designed simulations often reduce learning time significantly [16].

2.1.2. Business pitching

A business pitch is a presentation that involves start-up founders and potential investors regarding the business. It includes an oral discussion that begins as a planned talk and ends up with a question-and-answer session. That same pitch is also used in business classrooms, business plan design, and business competitions, where students as start-up founders pitch to judges, who are usually investors. Learning by participating actively and by doing is one of the current approaches in teaching and learning. This is due to the fact that communication skill is one of the important skills to be mastered by undergraduates of the 4IR [8].

Business pitching is one of the learning mediums in entrepreneurship that helps students improve their communication skills and enhance their self-esteem. In addition, students can use these skills in their job interviews as they need to pitch themselves in the job market and compete with other candidates. With sufficient preparation, well-researched plan, and interesting add-ons such as their website resume, students get to experience

‘real’ competition and understand their ‘key features’ as potential workers. Therefore, business pitching does not only teach students about business, but it also helps students to boost their self-esteem and self-marketing.

2.1.3. Massive Open Online Course

The implementation of Massive Open Online Courses (MOOCs) was initially introduced in 2014. Spurred on by rapid advances of technology, MOOCs have proliferated over the past decade and made (higher) education available to all students from around the world at reduced cost compared to traditional university schemes [17]. Nasir [18] contends that teaching in the classroom can no longer remain conventional if universities want to produce competitive, innovative and creative graduates. She further states that those born in the era of mobile computing, which he called Generation Z, are skilled in sharing information through social media and are interested in learning new things online. Therefore, educators need to create teaching and learning contents which can stimulate students’ learning experience.

The use of MOOCs in teaching and learning has provided significant benefits in education. Some benefits that have been identified are as follows:

- MOOCs allow higher learning institutions to reduce the cost of creating and delivering programs without affecting quality.
- MOOCs are able to reach wider audience of students – from all levels anywhere in the country via internet connection can now access high quality courses although not currently enrolled at higher learning institutions.
- MOOCs allow higher learning institutions to enhance their learning programs with contents of international courses and/or adding new courses for the students.

MOOCs are regarded as a dominant force in the pedagogical transformation. UKM has launched its own version of MOOCs and has been actively using them for teaching and learning. In 2016, a total of 122,021 students registered for the UKM courses and beginning 2018, UKM has added more courses that use MOOCs as teaching and learning platform.

2.1.4. Social Networking Applications

Social networking encompasses a variety of online collaborative environment that is specifically known as Web 2.0 [19] emphasizes that Web 2.0 can assist students to acquire knowledge effectively as they show positive perceptions towards the use of Web 2.0. Social networking is a tool that gives students the opportunity to think differently about their learning space. These tools consist of Facebook, Instagram, WhatsApp and YouTube where massive information is disseminated to people all around the world.

Additionally, by using social networking tools in the teaching and learning process educators would be able to

engage with their students directly or indirectly. Other advantages provided by social networking tools are effective learning environments that can influence students’ engagement, self-motivation, and personal interactions. Therefore, it is important to note that social networking tools are powerful means to enhance learning, networking and students’ engagement.

Facebook

Facebook is a social media web app that most students use in their daily life. They use Facebook to communicate with their friends, find information and play games. They are more likely to spend time socializing with their friends and getting updates on entertainment via Facebook. These cause them to spend less time in studying books or surfing for academic online content. Given these scenarios, educators should take advantage by using Facebook creatively to support students’ continuous learning activities.

Facebook appears to be one of the most potential and effective tools as students literally respond to discussions quickly and they are more comfortable sharing their information and opinions in their own “space”. Furthermore, by using Facebook in the learning process, the role of students can change from only receiving knowledge to both searching and sharing their knowledge. Additionally, interactions with educators can become more impulsive as both parties can respond quickly via Facebook. Apart from discussion and sharing of knowledge, Facebook is also used to share video and document links. In addition, students can also share their new findings or knowledge beyond class time and thus make learning a continuous activity. As a result, Facebook has an excellent potential to serve as a lifelong learning channel for lecturers and students in improving the quality of teaching and learning of entrepreneurship.

Instagram

In October 2010, Instagram was launched and introduced to the world. Since then, Instagram has rapidly gained popularity with over 100 million active users as reported in April 2012 and over 300 million in December 2014 [20]. In fact, Instagram is still one of the most popular social media networks nowadays. A recent survey also confirmed that teenagers, especially students, are the most popular Instagram users. This is due to the advantages offered by Instagram such as an online mobile photo-sharing, video-sharing, and social networking service that generally capture students’ interest. Therefore, higher learning institutions can exploit this entertainment-oriented site as an educational tool.

Reference [3] had used Instagram for their studies and concluded that the use of media technology helped in the learning process. Instagram is an effective tool for students’ interactions especially in the discussion of their task-related activity. Students can enhance their entrepreneurial skills as well as communication skills.

They will use Instagram as a medium for communication as well as for wider engagement in the learning process. Therefore, mobile learning via Instagram proves to be an ideal environment for transactional learning. Instagram correspondence provides students with the opportunity to engage in a dialogical process [21] where reading, writing, questioning, arguing and clarifying were incorporated.

WhatsApp

WhatsApp is a free messenger app that works on various platforms like smartphones and laptops [22]. This app is widely used among students to send multimedia messages such as pictures, videos and audio, and simple text messages. It is free and easy to use with low internet data usage. WhatsApp is undoubtedly the most downloaded messenger apps utilized by almost 1.2 billion users monthly.

According to Bere [23], WhatsApp messenger has the following collaborative features:

- Multimedia that allow users to exchange pictures, text messaging, video and voice notes.
- Group chat that supports interaction for up to 50 members of the group.
- Unlimited messaging where users can share messages with others without limits.
- Offline messaging where messages will be automatically saved when the device is off or out of range.
- Pin and username that give advantage where WhatsApp users do not have to worry about remembering their passwords or usernames because it works through phone numbers and integrates with users' address book.

In regards to WhatsApp use among university students, it is found that WhatsApp groups are highly favored to serve several purposes mainly for communicating, creating dialogue and sharing among fellow students as well as building a learning platform. These bring about a pleasant environment and an in-depth acquaintance amongst students, which has a positive influence upon the manner of conversation. Interestingly, the simple operation scheme offered by WhatsApp makes the program accessible to everyone from a wide range of age and background.

YouTube

YouTube is known as a site for sharing video files for public use. Reference [24] notes that the YouTube site is ranked first as one of the most popular sites for sharing videos. On top of entertainment, YouTube has also been widely used in many Web 2.0 applications in education. In line with the development of technology and information revolution, YouTube has become an interactive educational channel and platform that fits perfectly with the requirements and needs of students from the Internet generation.

The YouTube site has a lot of strengths in supporting the

educational process as presented below:

- YouTube improves the quality of education by providing access to a large number of public videos for free in various sectors.
- YouTube is easy to use as it does not require certain skills to browse or download videos and share with others.
- YouTube provides real environment for education with video and audio communication around it with texts and images.
- YouTube provides an opportunity for students especially slow-learners to learn according to their ability and understanding as it allows them to watch, return and pause while watching.
- YouTube gives students the opportunity to discuss and contact their lecturers regarding the scientific materials presented, and it allows the lecturers to receive responses from students and provide explanation to them.

3. Methodology

Informed by the quantitative research design, this study deployed an online survey to assess the impact of teaching and learning approaches of the EE course in UKM. The online survey was divided into 3 main components which are the demography of respondents, knowledge assessment and skills assessment. The survey was distributed prior to the course at week 1 of the semester, and once again at the end of the semester (Week 14) to 1350 UKM undergraduate students. In assessing knowledge, 10 questions of which were key points of the curriculum covered in the module were asked. Students have the option to answer either right, wrong or unsure. For assessment of skills, 3 skills were assessed using statements (3 statements for each skill). A Likert scale of 1-4 is given. The items were grouped according to the skills expected. The three skills are business ideation, marketing, sales and cash flow skills, and business project management skills. The values from students' answers were converted to percentages (out of 100) and a paired-sample T test was done on the pre and post-test. Analysis were done by SPSS Ver.25 to quantify the knowledge acquired and skills gained by the student prior to the course and after the course.

4. Results

4.1. Demography of Respondents

Assessment were made to 1350 UKM undergraduates who enrolled in EE course as one of the compulsory subject (n=1350). The distribution of the undergraduates is as described in Table 1. The undergraduates were all in the

same cohort in UKM and underwent the same module and assessments according to the guidelines of UKM. These students are in different sets and taught by different lecturers, but abide to the same teaching plans on a weekly basis. One set of class consists of 100-150 students.

Table 1. Demography profile of respondents

Item	Description	Frequency	%
Gender	Female	999	74.0
	Male	349	25.9
	Undisclosed	2	0.1
Degree Study	Science based	626	46.4
	Social science based	722	53.5
	Undisclosed	2	0.1
Prior education before Degree	Diploma	93	6.9
	Matriculation	695	51.5
	STPM	383	28.4
	Others	178	13.2
	Undisclosed	1	0.1
Business in the family	Yes	328	24.3
	No	1016	75.3
	Undisclosed	6	0.4
Prior knowledge in entrepreneurship	Yes	122	9.0
	No	1222	90.5
	Undisclosed	6	0.4

From the demography profile, 74% students are female. This is congruent with the average intake of female undergraduate students in UKM every year. For this cohort of students, slightly more of them are pursuing a social

science based degree (53.5%) than science based. Among the students, only 28.4% students came from a family with business background, and only 9% has prior knowledge in entrepreneurship before enrolling into EE course in UKM. These demographic findings would help link other findings from the survey.

4.2. Knowledge Assessment

The knowledge of the students was assessed pre (at week 1 of the semester) and post (at week 14 of the semester) for the subject. Ten statements were included in the survey, which outlines the key points of each module for the subject. Analysis were done on the results and are displayed in Table 2.

From the analysis, we can conclude that the percentage of students that marked the correct statement does not increase significantly pre and post course. Some knowledge statements even have a lower percentage post course, such as statements number 2 and 10 with a decrease of 1.3% and 6.9% respectively. We can also highlight that there are still many statements which students are unsure of even after they have completed their 14 weeks course. This is especially true for statement number 4, whereby percentage of students unsure is 43.7%.

The survey was conducted in an online platform, and the students were given a time frame to complete the survey at their own location and time. Since this survey does not carry any marks or formal assessments, students probably did not try to think attentively to get the answers right. Furthermore, there is an option for uncertainty, which would be the answer they will mark to expedite the completion of the survey.

Table 2. Percentage of knowledge assessment

Knowledge statements	Percentage (%)					
	Right		Unsure		Wrong	
	Pre	Post	Pre	Post	Pre	Post
1 An entrepreneur is a person who explores new business in a risky situation for the purpose of gaining profit.	13.3	14.8	12.1	12.6	74.6	72.6
2 A process of exploring idea where the idea is transformed into a product that can be placed on the market is known as entrepreneurship.	85.9	84.6	11.8	11.9	2.4	3.6
3 A gross profit is sales minus purchases	9.2	12.1	33.5	25.0	57.3	62.9
4 The liability borne by a sole proprietor is the same as in a partnership.	19.9	20.0	52.5	43.7	27.6	36.3
5 Business ethic is defined as the behavior or belief that influence a person in performing better in business functions.	76.9	78.7	17.4	15.7	5.7	5.6
6 A reasonable cash flow statement is an important element in a business proposal.	2.7	3.1	20.3	14.1	77.0	82.7
7 Entrepreneurship risk is higher in companies compared to a sole proprietorship.	13.7	17.1	34.3	30.7	52.0	52.1
8 Operation in entrepreneurship refers to the process used to create and sell goods or services.	72.3	75.9	21.9	18.4	5.8	5.7
9 The breakeven price is defined as neither profit nor loss.	45.8	71.3	47.1	21.6	7.1	7.2
10 Product, price, people and promotions are the components in marketing strategy.	86.6	79.7	10.4	11.5	3.0	8.8

4.3. Skills Assessment

Three different skills were assessed pre and post course. Each skill is assessed by 3 statements. Cronbach alpha reliability score for all the three skills is more than 0.7, thus proves that all the statements are reliable (Table 3).

Table 3. Reliability scores for each skill assessed

Skill assessed	Mean	SD	Cronbach alpha value
Business Ideation	4.50	1.124	0.706
Marketing, Sales and cash Flow	6.66	1.671	0.732
Business Project Management	6.60	1.687	0.755

The items were grouped according to the skills expected. The values from students' answers were converted to percentages (out of 100) and a paired-sample T test was done on the pre and post-test. A paired sample T-test was conducted to compare students between the pre and post survey, to identify significant increase in skills acquired amongst students. There is a significant increase in all the three skills assessed as displayed in Table 4.

The findings outlined that there is significant increase in skills that students perceived they acquired from the 14-week course. The most skills acquired were about sales, marketing and cash flow. These skills are important skills used in the Online Business Simulation (OBS) gaming component, as the students will have to apply their knowledge in a reality-like game in order to complete it. This is also true in project management skills. In essence, all the three skill sets are acquired by the students through the current approach of teaching and learning EE.

5. Discussion

Approach towards teaching and learning is a vital factor in achieving the learning outcomes. Taking into account that the audiences of the EE subject would cover all

students either with any business background or none at all, the learning outcomes are basic and the approaches that are used are diversified and simple. A critical review in [25], divided EE outcomes to six themes namely; entrepreneurial attitude, entrepreneurial skills and knowledge, intention, competency, motivation and business start-ups.

In UKM, amongst the approaches used were the Online Business Simulation (OBS), business pitching, MOOC, Social Networking tools (i.e., Facebook, Instagram, WhatsApp & YouTube), as exhaustively discussed in the previous topic. All these approaches gained different experience and skills to the students. In this research, investigation shows that there is no significant impact on cognitive knowledge. This is in line with findings of Cheng and colleagues [26], which highlights low understanding among students of EE towards entrepreneurship basic knowledge.

We believe that this is due to the approach of teaching whereby the subjects are less focused on theories, there is minimum lecture by the lecturers and the approach is more towards application. There are online lectures in which the students are able to self-study at their own pace and time. In addition to that, another significant factor that might cause ineffective knowledge transfer is the quantity of students in each class. On the grounds that the subject is compulsory, the class consists of very large number of students, which can sum up to 100 students per class. This might be a crucial bottleneck in delivering effective lectures and discussing theories related.

In regards to the teaching and learning of this subject, we observe that the tools that have been used polish skills more rather than knowledge. Business ideation skills are cultivated through the team-up process in groups and coming up with a business idea. Students then showcase their ideas through business pitching. Marketing, sales and cash flow skills are picked up using the business pitching approach, social networking tools and OBS. Whereas, the students learned project management in OBS.

Table 4. Descriptive statistics for paired sample T-test

Skills assessed		%	% difference	N	SD	SEM	Sig. (2-tailed)
Business Ideation	Pre	70.17	+ 9.81	1350	19.687	.536	.000
	Post	79.98		1350	16.442	.447	
Sales, marketing & cash flow	Pre	67.06	+ 12.71	1350	19.442	.529	.000
	Post	79.77		1350	15.619	.425	
Project management	Pre	68.21	+ 11.96	1350	19.349	.527	.000
	Post	80.17		1350	15.654	.426	

*SD – Standard deviation, SEM – Standard error mean

Although the initiative of making EE a compulsory subject to foster entrepreneurship spirit among graduates, the whole EE ecosystem is crucial in making it a success. A study in Bandung Institute of Technology (ITB) of Indonesia, showcased an initiative to create a holistic ecosystem to foster entrepreneurship among students. This includes aligning its vision and mission, introducing incubators in campus and providing infrastructure towards creating entrepreneurial culture in campus [27]. This might be a better strategy, although might not be appropriate for implementation by all universities.

There are limitations to this study in terms of the survey instrument, instructors/lecturers, and language issues. The survey instrument was distributed online, hence respondents' response with their own understanding and in haste. As the survey instrument is in English, we foresee that it would be a barrier for some students to actually understand the questions to give correct views and answers. The implementation of this compulsory course throughout the University makes it a huge challenge to equip all instructors and lecturers to cover all students. This would be a limitation to attain the learning objectives highlighted.

6. Conclusions

In order to prepare students to be successful in the 21st century, global economy, combining entrepreneurship syllabus with new methods of teaching and learning is essential. Therefore, learning conducted via electronic media, usually on the Internet has been used creatively by many higher learning institutions in their teaching and learning process. In UKM online quizzes, Online Business Simulation (OBS), business pitching and Massive Open Online Course (MOOC) are widely utilized. The other learning medium is social networking tools such as Facebook, Instagram, WhatsApp, and YouTube. They are part of a redefinition of how the educators transmit knowledge, skills, and values to the younger generations of students and future employees. Hence, all stakeholders, especially the government, need to ensure that all tools and initiatives are well placed in all higher learning institutions to cope with the demands of the 4IR in order to give benefits to potential entrepreneurs in the future. We would recommend that initiatives should be done to identify approaches that would increase the amount of knowledge gained and make the classes smaller in terms of quantity of students, to facilitate effective knowledge transfer.

Acknowledgments

We gratefully acknowledge the grant support from Universiti Kebangsaan Malaysia for the research grant (GGP-2017-042). However, all the contents in this article are of the authors' responsibility.

REFERENCES

- [1] Ministry of Higher Education (2015). Malaysia Education Blueprint 2015-2025 (Higher Education) MINISTRY OF EDUCATION MALAYSIA. Available at: <https://www.um.edu.my/docs/um-magazine/4-executive-summary-pppm-2015-2025.pdf>.
- [2] Hynes, B. (1996). Entrepreneurship education and training - introducing entrepreneurship into non-business disciplines. *Journal of European Industrial Training*, 20(8), pp.10-17.
- [3] Hassan, R., Mohd Tawil, N., Ramlee, S., Ismail, K. and Wahi, W. (2015). Exploring academic entrepreneurship: A case study at Universiti Kebangsaan Malaysia. In: *European Conference on Innovation and Entrepreneurship. Academic Conferences International Limited.*, p.231.
- [4] Oosthuizen, J. (2017). The Determinants of Fourth Industrial Revolution Leadership Dexterity: A Proposed Framework for 4IR-Intelligence and Subsequent 4IR Leadership Development. In: *4th International Conference on Responsible Leadership. GIBS - Johannesburg*.
- [5] Wahi, W., CheMusa, N., Mohdali, R. & Hassan, R. (2019). Addressing the literacy skills of B40 students towards 4IR workplace: development of future-proof graduate module (FPGM). In *Proceedings of IEEE TALE2019 International Conference on Teaching, Assessment and Learning for Engineering*, p. 1057 - 1060.
- [6] Siemens, G. (2005). Connectivism: Learning as network-creation. *ASTD Learning News*, 10(1), 1-28
- [7] McFarland, K. (2017). Entrepreneurship Education and Experiential E-Learning: A Literature Review. In *Developments in Business Simulation and Experiential Learning: Proceedings of the Annual ABSEL conference (Vol. 44, No. 1)*.
- [8] Khan, M.S., Khan, I., U-Din, S., Muhammad Ismail, H., Khattak, R. and Jan, R. (2015). The impacts of ICT on the students' Performance: A Review of Access to Information. *Research on Humanities and Social Sciences*, 5(1), pp.2225-484.
- [9] Yusuf, M.O. (2005). Information and communication technology and education: Analyzing the Nigerian national policy for information technology. *International Education Journal*, 6(3), pp.316-321.
- [10] Kirschner, P. and Wopereis, I.G.J.H. (2003). Mindtools for teacher communities: a European perspective. *Technology, Pedagogy and Education*, 12(1), pp.105-124. Available at: <https://doi.org/10.1080/14759390300200148>.
- [11] Collins, A. and Halverson, R. *Rethinking Education in The Age of Technology : The Digital Revolution and Schooling in America*, Teachers College Press, United States, 2018.
- [12] Mohd Tawil, N., Hassan, R., Ramlee, S. and Batcha, Z.K. (2015). Enhancing Entrepreneurship Skill among University's Students by Online Business Simulation. *Journal of Engineering Science and Technology, Special Issue on 4th International Technical Conference (ITC) 2014*,

- pp.71–80.
- [13] Haag, M., LeTourneau, J., Marra, R., Patterson, D., Smith, M. and Lamberson, W. (2018). 5 The effectiveness of a gamified, online, beef cattle breeding simulation to increase student engagement, motivation, and learning gains. *Journal of Animal Science*, 96(suppl_3), pp.499–499.
- [14] Hassan, R., Mohd Tawil, N. and Razak, N.A. (2014). An overview of business simulation system for Malaysian entrepreneur. In: 2014 4th International Conference on Engineering Technology and Technopreneuship (ICE2T). IEEE, pp.15–18.
- [15] Gilli, R., Pulcini, M., Tonchia, S. and Zavagno, M. (2002). E-learning: a strategic instrument. *International Journal of Business Performance Management*, 4(2–4), p.316.
- [16] Akçetin, E. and Akçetin, N.Ç. Learning International Trade by Game in Maritime Business Schools. *Procedia Social and Behavioral Sciences*, Vol.62,514–520, 2012
- [17] Andersen, B.L., Na-Songkhla, J., Hasse, C., Nordin, N. and Norman, H. Perceptions of authority in a massive open online course: An intercultural study. *International Review of Education*, 64(2), 221–239, 2018.
- [18] Nasir, N. (2016). New Teaching and Learning Method for Generation Z • UKM News Portal. www.ukm.my. Available at: http://www.ukm.my/news/Latest_News/new-teaching-and-learning-method-for-generation-z/.
- [19] Majid, N.A.. (2014). Integration of web 2.0 tools in learning a programming course. *Turkish Online Journal of Educational Technology*, 13(4), pp.88–94.
- [20] Business of Apps. (2020) Instagram Revenue and Usage Statistics. Online available from <http://www.businessofapps.com/data/instagram-statistics/>
- [21] Simatupang, F.F. and Salam, N.E. (2015). Fenomena Selfie (Self Portrait) Di Instagram (Studi Fenomenologi Pada Remaja Di Kelurahan Simpang Baru Pekanbaru). *Jom FISIP*, 2(1).
- [22] Gon, S. and Rawekar, A. (2017). Effectivity of E-Learning through Whatsapp as a Teaching Learning Tool. *MVP Journal of Medical Sciences*, 4(1), p.19.
- [23] Bere, A. (2012). A comparative study of student experiences of ubiquitous learning via mobile devices and learner management systems at a South African university. In: *Proceedings of the 14th Annual Conference on World Wide Web Applications*. Durban.
- [24] Othman, F.A. (2018). Youtube as Engagement and Learning Tool in Higher Education Society. *Journal of Fundamental and Applied Sciences*, 10(4S), pp.137–142.
- [25] Othman, N. H., & Othman, N. (2019). A Systematic Review on Entrepreneurship Education in Higher Learning Institutions in Southeast Asia. *Universal Journal of Educational Research*, 7(11), 2406-2416.
- [26] Cheng, M. Y., Chan, W. S., & Mahmood, A. (2009). The effectiveness of entrepreneurship education in Malaysia. *Education Training*.
- [27] Sakapurnama, E., Huseini, M., & Soeling, P. D. (2019). Building Entrepreneurial University: Case from HEI's in Indonesia. *Universal Journal of Educational Research*, 7(12), 2747-2754.