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Online Student Engagement and Entrepreneurial Intention: Mediating Role of Individual Entrepreneurial Orientation

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Abstract: Using new digital technology in education has become a reality everyone must accept with the development of Education 5.0. Moreover, online learning is no longer alien to most university students after the COVID-19 pandemic. Currently, the traditionally practical-focused entrepreneurship course is also available online. However, little extant literature has investigated student engagement in online learning, particularly for entrepreneurship courses. Therefore, this paper aimed to establish a new model to show how student engagement in online learning affected individual entrepreneurial orientation (IEO) and entrepreneurial intention (EI). This paper employed the online student engagement (OSE) model, the concept of IEO and the Theory of Planned Behavior (TPB) in developing the research model. The data were analyzed using partial least squared-structural equation modeling (PLS-SEM). The results indicated that IEO positively affected two elements of OSE, namely emotion and participation. A positive relationship was found between IEO and EI. It further found that IEO mediated the relationships between emotion and EI as well as between participation and EI. Therefore, it concluded that IEO was a crucial determinant of EI and it enhanced the relationship between OSE and EI. This paper produced both literature and practical outcomes. Literary, it produced a new model which explained the relationships among OSE, IEO and EI. Practically, it identified critical factors that higher education institutions could take into consideration in developing student entrepreneurs. It was also critical in supporting Malaysian governmental agendas that focused on developing competitive entrepreneurs, such as the Economic Transformation Program (ETP) and Malaysia Education Blueprint 2015-2025 (Higher Education).

Keywords: *Engagement, Entrepreneurship, Intention, Students, University*

1. Introduction

Due to the COVID-19 pandemic, most universities have switched from traditional classroom methods to advanced online approaches. Nevertheless, the use of online learning was undoubtedly not new because it was already a new trend in Education 4.0. In the more current Education 5.0, learning through new digital technology is no longer a trend but a reality that everyone has to get used to (Sydle, 2022). As Education 5.0 emphasizes students' social and emotional development (Sydle, 2022), it is important to research the effects of online learning on students' personal and psychological development.

As Meyer (2014) mentioned, the effects of student engagement on learning required further study. Since online learning is different from traditional ways of learning, and many universities have adopted online learning opportunities, there is a need to investigate further student engagement in online learning (Redmond et al., 2018). It is known that online student engagement (OSE) is a key component in making sure students can study and perform well in their online classes. However, OSE is considered a relatively new concept in studies of student engagement, and literature is scarcely available.

Furthermore, the study of student engagement should look into specific courses or subject domains (Whitney et al., 2019). Therefore, it is viable to look into the influence of student engagement in online learning on the course outcomes of a specific course. Entrepreneurship has long been offered as a core or elective course or subject by many universities. In entrepreneurship education, Mavrina and Mingaleva (2017) suggested that it should have both theoretical and practical aspects to allow the learners to gauge knowledge and skills. However, the emergence of new digital technology in learning and the widespread COVID-19 have transformed the delivery method of entrepreneurship courses to online methods. Students' engagement in an online entrepreneurship course and, its effects on the course outcomes and intention towards starting a new venture

remained unknown. Specifically, questions such as "How does OSE affect individual entrepreneurial orientation (IEO) and EI among university students?" remained unanswered. Due to the above-mentioned gaps, this study aimed to suggest a model to study the direct and indirect relationships between OSE, IEO and EI. Particularly, this study was important in providing new insights into students' online learning flexibility, ability and outcome of entrepreneurial online courses in the Malaysian context. Furthermore, it also sheds light on ways to enhance the online learning experience among Malaysian students.

2. Literature Review

Online Student Engagement (OSE): A well-accepted definition of student engagement is still lacking (Dixson, 2015). According to Kuh (2003, p. 25), student engagement is defined as "the time and energy students dedicate to educationally sound activities both within and outside of the classroom." Student engagement is a crucial element in education because it determines collegiate quality and student success (National Survey of Student Engagement, NSSE, 2020). Furthermore, when students are well-engaged in their learning, it would ensure that learning outcomes can be attained successfully (Collaço, 2017).

It is undeniable that the education world is entering a new era after the establishment of Education 5.0; which emphasizes on utilization of new digital technology to provide more humanized teaching to students for improvement in life and society (Sydle, 2022). In addition, the widespread COVID-19 pandemic around the globe has also propelled the role of online education. Although student engagement has long been studied by many researchers, studies about student engagement in online learning are still limited. In addition, evaluating student engagement at the institutional or course level is a challenging task for higher education institutions (Mandernach, 2015). Since online learning is very different from traditional classroom learning, it is possible to examine OSE in more detail.

To study OSE, Dixson (2015) has developed a model that comprises four components, they are skills, participation, emotion and performance. According to the model, students' emotional engagement in learning could be developed over time as a result of their efforts exerted in learning and interactions with other students. Previous research has effectively demonstrated the relationship between online learning engagement and academic performance. For instance, correlation was found between student engagement and learning outcomes (Bolliger & Halupa, 2018). The finding was supported by Rajabalee et al. (2020) in which top performers had greater levels of engagement than low performers. Moreover, student satisfaction was proven to be influenced by components of OSE such as behavioral, emotional and cognitive engagement (Kucuk & Richardson, 2019).

In terms of entrepreneurship learning, its outcomes could be measured by several indicators such as the demonstration of entrepreneurial orientation, increase in EI and number of actual business startups. Based on the discussion in the previous paragraphs, it could be said that OSE influences learning outcomes such as a person's entrepreneurial orientation and EI.

Individual Entrepreneurial Orientation (IEO): Entrepreneurial orientation (EO) has long been studied by many researchers as a firm-level construct that influences a firm's performance. As described by Lumpkin and Dess (1996), EO consists of five dimensions, namely autonomy, innovativeness, risk-taking, proactiveness and competitive aggressiveness. Although EO has been widely recognized as a firm-level construct, some researchers urged that it could be treated as an individual construct (Bolton & Lane, 2012; Robinson & Stubberud, 2014).

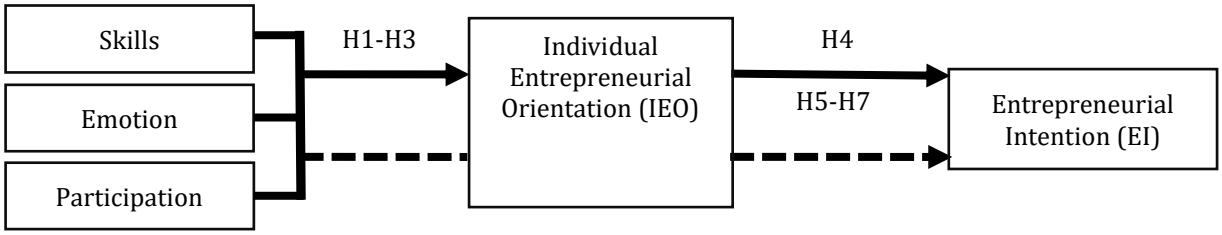
IEO has been investigated by researchers from various countries. Some of them treated IEO as a unidimensional construct, while others considered it as a multidimensional construct. Specifically, Koe (2016) found that two dimensions of IEO, which were proactiveness and innovativeness significantly influenced students' EI. In addition, Koe et al. (2021) found that risk-taking and pro-activeness positively and significantly influenced university students' intention to take up technology-based entrepreneurship. To date, various studies have obtained different results on the effects of elements of IEO on EI. Therefore, the influence of IEO on EI indeed required further examination.

Entrepreneurial Intention (EI): Ajzen (1991) mentioned in the Theory of Planned Behavior (TPB) that intention could be a good indicator of a person's behaviors. Since intention could predict a person's actual behavior, it is believed that EI is a good antecedent of entrepreneurial behavior. As Hisrich et al. (2017, p.16) described, EI is a "motivational factor that influences individuals to pursue entrepreneurial outcomes".

Studying EI is considered viable because the process of becoming an entrepreneur is a planned behavior and it requires an intention to happen (Krueger et al., 2000). Throughout the years, researchers have identified various factors that influence an individual's EI. One of the triggers that stimulates EI is entrepreneurship education. Students learned various entrepreneurial thinking, knowledge, skills, and practices through entrepreneurship courses. Previous studies supported that individuals who have completed entrepreneurship courses or training exhibited a certain level of EI (e.g.: Keat et al., 2011; Farashah, 2013; Asimakopoulos et al., 2019). Specifically, Mavrina and Mingaleva (2017) pointed out that the entrepreneurial thinking and skills that students learned from entrepreneurship training helped to encourage them to take up entrepreneurship. Alshebami et al. (2020) also concluded that students gained the desired attitude and self-efficacy from the entrepreneurship courses that they attended; the attitude and self-efficacy subsequently affected their EI.

The Proposed Model and Hypotheses: As discussed in the previous section, OSE could affect the learning outcomes of entrepreneurship courses, such as IEO and EI. It is believed that if students were given effective entrepreneurship education, they would acquire entrepreneurial qualities, show interest in being entrepreneurs, and intend to become entrepreneurs. Although Dixson (2015) has suggested four elements in his model, this study only took into account skills, participation and emotion. This was because students who participated in this research had not yet received their results at the time of the study. Moreover, IEO was treated as a unidimensional construct. As such, the following research model (Figure 1) was suggested.

Figure 1: Research Model



Using the segmentation approach in theorizing the mediation effect, the following hypotheses are suggested to guide this study:

H1: Skills positively influence IEO.
H2: Emotion positively influences IEO.
H3: Participation positively influences IEO.
H4: IEO positively influences EI.
H5: IEO mediates the relationship between skills and EI.
H6: IEO mediates the relationship between emotion and EI.
H7: IEO mediates the relationship between participation and EI.

3. Research Methodology

This study employed a quantitative research method using a survey. The quantitative method was deemed appropriate because all variables in this study were measurable and quantifiable. It carried out a causal relationship or hypotheses investigation because there were seven hypotheses suggested to test the relationships among OSE, IEO and EI. Since the survey method was employed, this study was performed in a natural setting with very minimal interference from researchers. In terms of a unit of analysis, the individual student was required to provide the required information. Data was collected through a cross-sectional time horizon in which data collection was performed only once.

The population comprised all full-time undergraduate students in a Malaysian public university who had

registered and completed the course Principles of Entrepreneurship, which was conducted via the "open and distance learning" (ODL) method. In this study, the ODL was considered a non-traditional teaching and learning method, in which it provided a flexible, multiple access and multiple modes of learning through an online learning system to learners (Centre for Innovative Delivery and Learning Development, CIDL, 2024). There were 681 elements in the population. In terms of sample selection, a simple random sampling method was employed to ensure that each element of the population had an equal chance of being chosen to be a subject in the sample (Sekaran & Bougie, 2016). First, the academic department provided a list of all the students enrolled in the course. Next, using the random number produced by the random number generator, the subject was chosen from the list. Last, 300 students were chosen at random by referring to Krejcie and Morgan's (1970) sample size determination table. It was done so because a sample size of at least 248 subjects was required for a population of 700. Although 300 sets of questionnaires were sent out, 290 valid responses were successfully gathered.

An electronic self-administered questionnaire was developed as the research instrument of this research. It was deemed suitable for this study because all respondents were attending the classes online. To ensure its reliability and validity, items used in measuring OSE (17 items), IEO (10 items) and EI (6 items) were adapted from Dixson (2015), Bolton and Lane (2012) and Liñán and Chen (2009) respectively. For the 17 items of OSE, respondents were asked to rate their experience of the course for behavior, thought or sensation, based on a five-point rating scale with 1 denoting "not at all characteristic of me" to 5 denoting "very characteristic of me". Whereas for the items of IEO and EI, respondents had to determine how agreeable or disagreeable they were using a five-point rating scale, with 1 representing "strongly disagree" to 5 representing "strongly agree". Before the mass distribution of the questionnaire, it was face-validated by two academic experts and pre-tested with 30 respondents. The internal consistency analysis revealed that it was considered reliable with Cronbach's alpha values ranging from 0.767 to 0.884.

4. Findings and Discussion

Preliminary Analysis: From the data cleaning process, it was found that there was no missing data because respondents were required to answer all questions. Furthermore, it is important to assess the common method bias (CMB) to avoid underestimation or overestimation of relationships between variables and ambiguous conclusions (Memon et al., 2023). Therefore, this study employed Harman's Single Factor to statistically assess CMB. The result indicated that the total variance was 47.24%, which was lower than the threshold of 50%; hence, common variance bias did not exist.

Respondents' Background: At the end of the data collection period, this study successfully obtained 290 completed and usable responses from 300 questionnaires that were sent out to the sample subjects. Hence, it produced a pretty remarkable response rate of 96.67%. The high response rate could be due to data being gathered with assistance from academic staff and also class representatives. Regarding the information on respondents' backgrounds, it was discovered that females (f=238; 82.07%) made up a large portion of respondents. The respondents were enrolled in the Faculty of Business and Management (f=235; 81.03%) and the Faculty of Hotel and Tourism Management (f=55; 18.97%). As for the studying hours that respondents spent on the course, the majority of them studied for two to less than three hours on average per week (f=92; 31.72%). Meanwhile, a total of 250 respondents (86.21%) completed one to two exercises per week.

Measurement Model Assessment: Convergent validity, internal consistency reliability and discriminant validity were used in this study to evaluate the measurement model. Values of factor loadings, composite reliability (CR), average variance extracted (AVE) and Cronbach's alpha (α) are summarized in Table 1. Hair et al. (2014) stated that factor loadings of more than 0.708 need to be taken into account when assessing them. However, Hulland (1999) suggested that if AVE is greater than 0.50, loadings of at least 0.40 can be maintained. Therefore, item Emotion 3 was the only one removed because of its poor loading (loading=0.251); while all other items were retained. Since the α values were higher than 0.70, they were considered dependable. Furthermore, all CR and AVE values were regarded as acceptable because all CR values were higher than 0.70 and, all AVE values were greater than 0.50, (Hair et al., 2014). Therefore, the findings showed that this study had obtained convergent validity, indicator reliability, and internal consistency reliability.

Table 1: Item Loadings, Composite Reliability, Average Variance Extracted, Cronbach's Alpha

	Loading	CR	AVE	α
Skills		0.855	0.559	0.841
Skill1	0.706			
Skill2	0.609			
Skill3	0.771			
Skill4	0.824			
Skill5	0.782			
Skill6	0.774			
Emotion		0.916	0.798	0.915
Emotion1	0.913			
Emotion2	0.874			
Emotion4	0.880			
Emotion5	0.905			
Participation		0.878	0.617	0.874
Part1	0.645			
Part2	0.823			
Part3	0.765			
Part4	0.872			
Part5	0.808			
Part6	0.780			
IEO		0.936	0.631	0.935
IEO1	0.736			
IEO2	0.700			
IEO3	0.779			
IEO4	0.806			
IEO5	0.833			
IEO6	0.806			
IEO7	0.806			
IEO8	0.851			
IEO9	0.814			
IEO10	0.799			
EI		0.961	0.828	0.958
EI1	0.867			
EI2	0.912			
EI3	0.912			
EI4	0.935			
EI5	0.939			
EI6	0.893			

The discriminant validity of this study was further assessed by using Fornell and Larcker's criterion (Table 2), cross-loading criterion (Table 3) and Heterotrait-Monotrait ratio of correlations (HTMT) (Table 4). First, Table 2 demonstrates that Fornell and Lacker's Criterion was fulfilled because all square roots of AVEs (diagonal) were greater than the correlations (off-diagonal) of all constructs. Subsequently, Table 3 displays loadings for

the assigned constructions were greater than those for all other constructs. Finally, Table 4 shows that all HTMT values fell below the 0.85 criterion. The outcomes confirmed that discriminant validity had been attained. As a result, the measurement model was accepted as legitimate and dependable, allowing for the evaluation of the structural model.

Table 2: Fornell And Larcker's Criterion

	Skills	Emotion	Participation	IEO	EI
Skills	**0.748**				
Emotion	0.707	**0.893**			
Participation	0.733	0.729	**0.785**		
IEO	0.610	0.692	0.648	**0.794**	
EI	0.550	0.655	0.457	0.619	**0.910**

Table 3: Cross-Loading Criterion

	Skill	Emotion	Participation	IEO	EI
Skill1	**0.706**	0.549	0.429	0.417	0.497
Skill2	**0.609**	0.430	0.334	0.299	0.353
Skill3	**0.771**	0.583	0.546	0.453	0.414
Skill4	**0.824**	0.661	0.597	0.503	0.436
Skill5	**0.782**	0.637	0.637	0.519	0.434
Skill6	**0.774**	0.712	0.669	0.498	0.346
Emotion1	0.683	**0.913**	0.602	0.643	0.576
Emotion2	0.761	**0.874**	0.659	0.598	0.581
Emotion4	0.705	**0.880**	0.677	0.625	0.522
Emotion5	0.737	**0.905**	0.667	0.603	0.665
Part1	0.623	0.606	**0.645**	0.458	0.517
Part2	0.570	0.500	**0.823**	0.441	0.263
Part3	0.510	0.555	**0.765**	0.501	0.307
Part4	0.598	0.586	**0.872**	0.523	0.263
Part5	0.565	0.492	**0.808**	0.506	0.326
Part6	0.585	0.625	**0.780**	0.591	0.461
IEO1	0.500	0.548	0.502	**0.736**	0.467
IEO2	0.462	0.469	0.460	**0.700**	0.534
IEO3	0.465	0.526	0.452	**0.779**	0.469
IEO4	0.449	0.558	0.463	**0.806**	0.553
IEO5	0.532	0.570	0.524	**0.833**	0.508
IEO6	0.455	0.526	0.517	**0.806**	0.428
IEO7	0.459	0.498	0.571	**0.806**	0.406
IEO8	0.525	0.601	0.592	**0.851**	0.511
IEO9	0.525	0.606	0.522	**0.814**	0.502
IEO10	0.462	0.574	0.539	**0.799**	0.521
EI1	0.609	0.685	0.489	0.641	**0.867**
EI2	0.452	0.552	0.387	0.530	**0.912**
EI3	0.526	0.625	0.420	0.555	**0.912**
EI4	0.463	0.579	0.410	0.549	**0.935**
EI5	0.474	0.558	0.381	0.564	**0.939**

EI6	0.453	0.557	0.389	0.519	**0.893**

Table 4: Heterotrait-Monotrait Ratio Of Correlations

	Skills	Emotion	Participation	IEO	EI
Skills					
Emotion	0.829				
Participation	0.837	0.815			
IEO	0.676	0.746	0.712		
EI	0.611	0.696	0.494	0.649	

Structural Model Assessment: A bootstrapping approach was used in this study to evaluate the structural model using a 5000 resample. The outcomes of the structural model assessment are presented in Table 5. As shown, the absence of lateral multicollinearity was ascertained using the inner variance inflation factor (VIF). This was proven by the VIF values that were less than 5.0, ranging from 1.000 to 3.286. Thus, there was no lateral multicollinearity problem (Hair, et al., 2014).

Table 5 also illustrates the results for the four direct hypotheses suggested in this study. The findings demonstrated that the relationships between emotion and IEO ($\beta = 0.454$, $t=5.656$, $p<0.05$), participation and IEO ($\beta = 0.300$, $t=4.598$, $p<0.05$) and, IEO and EI ($\beta = 0.619$, $t=16.784$, $p<0.05$) recorded t-values higher than 1.645 and significant at less than 0.05 threshold of significance. Therefore, the findings supported the hypotheses H2, H3 and H4. However, the skill was found not to have any significant relationship with IEO ($\beta = 0.023$, $t=0.305$, $p>0.05$) with t-values lower than 1.645 and significant at more than 0.05 level of significance. As such, H1 was not supported. The results further indicated that OSE elements such as skill, emotion and participation accounted for 52.30% of the variance in IEO, as shown by the R^2 value of 0.523. In addition, it was also found that 38.30% of the variance in EI was explained by IEO based on the R^2 value of 0.383.

This research observed Cohen's (1988) rule for impact size (f^2) in generating R^2. It was recommended that effects could be minor ($f^2=0.02$), medium ($f^2=0.15$), and large ($f^2=0.35$). As such, skill ($f^2<0.001$) and participation ($f^2=0.077$) had small effects while emotion had a medium effect ($f^2=0.134$) in generating R^2 for IEO. In addition, IEO accounted for a large effect ($f^2=0.621$) in generating R^2 for EI. Furthermore, this study utilized Q^2 in investigating the model's predictive usefulness. As found, the Q^2 values for IEO and EI were 0.507 and 0.350 respectively. Since both Q^2 were greater than zero, this showed that the models had considerable predictive significance.

Table 5: Path Coefficient (Direct)

	Beta	SE	T-value	Decision	VIF	f^2	R^2	Q^2
Skill -> IEO	0.023	0.077	0.305	Not supported	3.286	0.001	0.523	0.507
Emotion -> IEO	0.454	0.080	5.656*	Supported	3.240	0.134		
Participation -> IEO	0.300	0.065	4.598*	Supported	2.449	0.077		
IEO -> EI	0.619	0.037	16.784*	Supported	1.000	0.621	0.383	0.350

* Significant at <0.05

Table 6: Path Coefficient (Indirect)

	Beta	SE	T-value	Confidence Interval Bias		Decision
				LL	UL	
Skill -> IEO -> EI	0.014	0.048	0.303	-0.059	0.096	Not supported
Emotion -> IEO -> EI	0.281	0.056	5.066*	0.190	0.373	Supported
Participation -> IEO -> EI	0.186	0.040	4.662*	0.121	0.254	Supported

* Significant at <0.05

Table 6 summarizes the path coefficient for mediation analysis. Note that the 95% bootstrapped confidence interval bias obtained for paths emotion-IEO-EI and participation-IEO-EI were [LL=0.190; UL=0.373] and [LL=0.121; UL=0.254] respectively. Since they did not straddle a zero in between LL and UL; thus, IEO significantly mediated the relationship between emotion and EI ($t=5.066$, $p<0.05$) and, participation and EI ($t=4.662$, $p<0.05$). As such, H6 and H7 were supported. However, a zero straddled in between LL and UL for the path skill-IEO-EI [LL=-0.059; UL=0.096]; hence, IEO did not significantly mediate the relationship between skill and EI ($t=0.303$, $p>0.05$). As such, H5 was not supported.

Discussion: The direct paths analyses showed that emotion and participation positively affected IEO and, that IEO influenced EI positively. The results supported Kucuk and Richardson (2019), in which emotional engagement was an important element in OSE. It proved that if students put in greater effort and desirability in learning entrepreneurship knowledge, especially in an online learning environment, they could have a higher orientation towards entrepreneurship. Online learning requires students to be independent and self-disciplined, thus emotionally engaged in learning is important. Furthermore, entrepreneurship is a process which requires individuals to actively interact with others. The findings showed that the participation of students in the online learning process successfully shaped their entrepreneurial orientation. Indeed, various types of interactions such as online discussions and forums help students to know each other better, provide support in learning and further enhance their understanding of the course. In addition, the positive relationship found between IEO and EI in this study supported Koe (2016) and Koe et al. (2021). It is well understood that a person's entrepreneurial abilities and capabilities would affect he or she in exhibiting intention towards entrepreneurship. This is further explained by the reasons why many higher learning institutions are providing entrepreneurship education and courses to their students.

In terms of indirect paths analyses, the mediation test pointed out that IEO was significant in mediating the relationships between emotion and EI, as well as between participation and EI. The significant mediation results further emphasized the importance of IEO in enhancing EI among students. This suggested that if students can engage in the online entrepreneurship course and gain sufficient entrepreneurial knowledge, they will develop entrepreneurial qualities and intentions. Therefore, developing entrepreneurial abilities and capabilities is crucial in training new entrepreneurs.

5. Conclusion and Implications

The purpose of this paper was to suggest a model for investigating the relationships among OSE, IEO and EI. Based on the literature review, OSE adopted in this study consisted of three elements which were known as skills, emotion and participation. Meanwhile, IEO was treated as a unidimensional construct. Based on the results, it can be concluded that components of emotion and participation in OSE were important in developing an individual's IEO, while IEO also influenced a person's EI. Furthermore, IEO was unneglected in enhancing the relationship between IEO and EI.

This study is significant because it sheds light on important factors in bolstering EI. There are two main expected contributions of this paper. It examines an integrated model that explains the relationships among OSE, IEO and EI. In particular, the model provides new insights into the effect of OSE in entrepreneurship research. It also examines IEO, which is a relatively new aspect of entrepreneurship study. Practically, this paper highlights some crucial factors in boosting EI among youths, especially university students. It helps the management of higher education institutions to encounter challenges in offering entrepreneurship courses through online platforms. In addition, it supports the government agendas and policies in developing a greater number of young entrepreneurs in Malaysia. Specifically, the model is relevant to Malaysian policies such as Malaysia Education Blueprint 2015-2025 (Higher Education) or MEB (HE) which focuses on developing students' entrepreneurial skills and supporting student-owned enterprises. It also supports the effort to develop young entrepreneurs carried out by various agencies such as Majlis Amanah Rakyat (MARA), Perbadanan Usahawan Nasional Berhad (PUNB) and Institut Keusahawanan Negara (INSKEN). It is hoped that this paper could assist universities and the government of Malaysia to develop more competitive young entrepreneurs.

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