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The Integration of Logic Model in Business Plan Simulation Approach for Effective Entrepreneurial Learning

(Integrasi Model Logik dalam Pendekatan Simulasi Rancangan Perniagaan untuk Pembelajaran Keusahawanan Yang Berkesan)

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ABSTRACT

Entrepreneurship education plays a vital role in entrepreneurship development. Risk-taking, creative problem-solving, social involvement, and role-playing should all be part of entrepreneurial learning. The logic model was used to evaluate business simulation. Efficacy and self-control can be improved in real-life situations by students. This research aims to find the integration of the logic model that contributes to effective entrepreneurial learning. We conducted a sample of 272 students taking a business plan simulation as part of entrepreneurial learning. PLS structural equation modelling was used to evaluate the logic model. The study found that there was a significant relationship between the input (student characteristics, lecturer characteristics, and simulation content) and the output (learning effectiveness), with the process of as a mediator (experiential learning). However, this research was limited to a selected university and students of an entrepreneurship course. The business plan simulation is also limited to offline use, which is based on VBA Excel. The research highlights the need for business simulations as an exercise and training for future business planning. Experiential learning is a factor that facilitates learning in a simulated environment. This study's findings also have practical consequences for future entrepreneurs and managers.

Keywords: Entrepreneurial education; business simulation; business plan; learning effectiveness; logic model

ABSTRAK

Pendidikan keusahawanan memainkan peranan penting untuk pembangunan keusahawanan. Pengambilan risiko, penyelesaian masalah kreatif, penglibatan sosial, dan permainan peranan semuanya harus menjadi sebahagian daripada pembelajaran keusahawanan. Model logik digunakan untuk menilai simulasi perniagaan. Keberkesanan dan kawalan diri dapat ditingkatkan dalam situasi kehidupan sebenar oleh pelajar. Tujuan penyelidikan ini adalah untuk mencari integrasi model logik yang menyumbang kepada keberkesanan pembelajaran keusahawanan. Kami melakukan tinjauan terhadap sampel 272 pelajar yang mengambil simulasi rancangan perniagaan sebagai sebahagian daripada pembelajaran keusahawanan. Pemodelan persamaan struktur PLS digunakan untuk menilai model logik. Hasil kajian mendapati bahawa terdapat hubungan yang signifikan antara input (ciri pelajar, ciri pensyarah, dan kandungan simulasi) dan output (keberkesanan pembelajaran), dengan proses sebagai mediator (pembelajaran berdasarkan pengalaman). Walau bagaimanapun, penyelidikan ini terhad kepada universiti terpilih dan pelajar kursus keusahawanan. Simulasi rancangan perniagaan juga terhad untuk penggunaan luar talian, yang berdasarkan VBA Excel. Penyelidikan ini menekankan perlunya simulasi perniagaan sebagai latihan dan latihan untuk perancangan perniagaan masa depan. Pembelajaran pengalaman adalah faktor yang memudahkan pembelajaran dalam persekitaran simulasi. Hasil kajian ini juga mempunyai kesan praktikal bagi usahawan dan pengurus masa depan.

Kata kunci: Pendidikan keusahawanan; simulasi perniagaan; rancangan perniagaan, keberkesanan pembelajaran; model logik

INTRODUCTION

Entrepreneurship education plays a vital role in entrepreneurship development. Risk-taking, creative problem-solving, social involvement, and role-playing should all be part of entrepreneurial learning. Entrepreneurial education is a crucial component that meets students' demands to acquire the knowledge and skills necessary for success in a diverse and complicated business environment (Jabatan Pendidikan Tinggi 2020). The ultimate purpose of an entrepreneurship education programme is to inspire students to become more passionate about entrepreneurship. This purpose can be accomplished by exposing students to a robust pedagogical entrepreneurial learning experience (Zainuddin et al. 2019). However, the current teaching method still uses a traditional approach that lacks student-centred learning and does not relate learning with real business scenarios. Teaching methods in traditional classrooms and their impacts on encouraging entrepreneurship among older students remain unclear (Nabi et al. 2017). Case studies, creating business plans, and classroom teaching are incorporated in entrepreneurship education (Mukesh et al. 2019). Compared to the traditional training approach of business planning, Yasin and Hafeez (2018) found that simulation can provide authentic learning and sustain engagement by allowing students to think about business

Starting a business requires a thorough understanding of its structure and plan. Planning is crucial for businesses to grow and compete in the future. Therefore, a business plan is a blueprint that serves as a guide for sustainable growth and direction. Businesses write a business plan as a guide for running their business and applying for business funding. Developing a business plan is a component of the entrepreneurship subject/course of study. Numerous higher education institutions offer a single course on business plan development as an advanced entrepreneurial course evaluated as a final year project. Developing a business plan is one of the entrepreneurial learning outcomes (Kriz & Auchter 2016). Experiential learning involves students implementing business-related activities, ranging from developing company concepts to fully-fledged venture creation programmes in which students form and operate a real business (Lackéus & Middleton, 2018). Simulation and business plan development are learning activities for entrepreneurial education (Duval-Couetil et al. 2016). While traditional evaluation methods such as lecture classes cannot assist students in connecting concepts to the real world, simulation's flexible and constructive approach enables them to do so. (Mani 2018).

The simulation can concentrate on experiential learning and engage the lecturer and student in an active process (Farashahi & Tajeddin 2018). The Malaysia Entrepreneurship Policy's first issue shows that confusion exists in understanding entrepreneurship education (Jabatan Pendidikan Tinggi 2017). Neck and Corbett (2018) emphasised the pressing need for entrepreneurship educators to receive entrepreneurial education training so that students may go beyond simply knowing about entrepreneurship to learning via entrepreneurship. The 4th issue list by the Malaysian Entrepreneurship Policy shows that there is still a lack of entrepreneurial and educational effectiveness (Jabatan Pendidikan Tinggi 2017). Farashahi and Tajeddin (2018) indicated that students perceive simulation as the most effective teaching method for developing their interpersonal skills and self-awareness, followed by case study and lecture, respectively. One type of experiential learning that occurs due to a production-based learning approach is preparing a business plan (Kuratko & Morris 2018). The idea is to combine entrepreneurial experiential learning from the business plan and business simulations in the Logic Model learning process. Through experiential learning tools and business simulations in teaching and learning, students can develop the skills and competencies necessary for success in the workplace (Ramli et al. 2018). Lohmann et al. (2019) recognise that variations in student characteristics, approaches to teaching, and pedagogy may affect learning performance. Using simulation inputs specified by the educator is an efficient way to generate the desired outcome (teachable moment) to achieve specific learning goals (Angolia et al. 2019). The research objective is to investigate factors in the simulation Logic Model that play a role in facilitating effective learning. This study aims to figure the processes and factors in business plan simulation that facilitate the effective learning of business plans. The factors for business plan simulation contain in the learning model using Logic Model. The Logic Model of business plan simulation adapts from the content of SIM GAME program theory by Hense et al. (2009), which contains student, simulation and teacher as the input while individual learning as a process and effect of the learning as an output. Our main and general research question, which leads us to address the stated research objective, is: in what is the relationship between input factors and output factor, which could facilitate effective learning.

LITERATURE REVIEW

The primary component of a business simulation is a model that attempts to replicate the real world and is built of arithmetic and logical expressions (Hall 2014). Due to the characteristics of the outcome, this model is primarily an input-process outcome model, in which relevant factors impacting a given outcome are evaluated. In other words, the Logic Model either reflects the logical flow of operations and the processes necessary to alter desired outcomes, or it is a causal chain of reasoning (Sorensen 2011). The Logic Model used by Garris and Ahlers (2002), which in its' nature is interactive, can be seen as an input-process-output model. The concept employs a dynamic learning strategy that emphasises the importance of continual repetition of game practice. The Logic Model is a technique for determining the effectiveness of simulation games. The model was built to assess educational game teaching environments; it is intended to compare to a simulation game model (Sorensen 2011). Several variables can be categorised as prerequisites (inputs), processes (actions), or effects (outcomes or outputs) within the Logic Model's three headings. The Logic Model highlights the components that contribute to the learning processes observed during business start-up simulations (Kriz et al. 2014). All variables were derived from previous research in the Logic Model, including contemporary simulation research.

ENTREPRENEURIAL EFFECTIVE LEARNING

Learning outcome measures were used in all courses to measure students' perceptual levels. Duval-Couetil et al. (2016) describe pedagogy as a factor influencing desired course outcomes in universities. Measuring learning outcomes through specific evaluations; each evaluation employs a unique pedagogical technique. Sorensen (2011) highlighted the revised theory of Bloom's taxonomy, which includes two cognitive and affective outcomes in the theory of logic model as a measurement of business game outcomes. Laine et al. (2019) proposed four core business plan learning outcomes for entrepreneurship education as follows: (1) Entrepreneurship Empowerment, (2) Management Skills, (3) Core Work-Life Skills, and (4) Growth Guidance.

Enhancing and incorporating pedagogical elements aimed at influencing the attitudes and beliefs of distinct segments of intake students may help us increase the effectiveness of entrepreneurial education efforts, enabling it to fulfil its role of instilling an entrepreneurial mindset and shaping future entrepreneurs (Shneor et al. 2020). Rogmans and Abaza (2019) and Wolfe (2016) assert that simulation games are not always beneficial, given the fact that their success is contingent upon student motivation and other student characteristics. Noor et al. (2018) determining the effectiveness of business simulations in supporting students in achieving their learning outcomes. Entrepreneurship simulation games were more effective than other learning tools.

STUDENT CHARACTERISTICS

Based on the emotional effects of cognitive activity, an entrepreneurial education model was introduced. It provides new inspiration to solve problems when students lack motivation in business education (Wang & Yang 2018). Motivation is considered an early drive that is assessed as an input factor from the students' perspective. The game can promote motivation and provide external incentives to motivate the learner to learn (Sorensen 2011). The effectiveness of business games often relates to student readiness and class acceptance of new methods. Student opinion and fun are characteristics that evaluate the effectiveness of simulation (Angolia et al. 2019). Students assess themselves on the readiness and acceptance of using business plan simulation. Their characteristics, such as knowledge and motivation, allow them to use the business plan simulation and gain experiential learning to achieve the approach's effectiveness. Simulation facilitates the learning experience for students with ordinary to advanced levels of knowledge by either reducing the sense of difficulty or increasing the perception of proficiency (Vlachopoulos & Makri 2017). The hypotheses are as follows:

H_{A1} There is a significant and positive relationship between Student Characteristics and Business Plan Simulation Learning Effectiveness.

LECTURER CHARACTERISTICS

A significant effort should be made to improve the quality of teaching by using effective teaching methods and encouraging the adoption of skills in on-campus practical programmes. Lecturers play a key role in addressing such a form of learning in business games (Raquel et al. 2019). The lecturer can introduce ideological games and challenges and expand students' training to promote active learning, work attitude, and cooperation (Wang & Yang 2018). In general view by Neck and Corbett (2018), andragogy requires educators to facilitate learning rather than transmit knowledge; to apply experiential techniques in real-world settings to real-world problems; to connect subject matter to students' needs, goals, and aspirations; and to view courses as learning experiences rather than learning silos. The educator promotes the learning process and assists students in developing their capacity to learn, apply previously acquired knowledge, and reflect on and improve their performance through practice (Neck & Corbett 2018). The method of assessing student points of view in this research is due to their awareness of the current knowledge transfer from the lecturer characteristics. The hypotheses are as follows:

H_{A2} There is a significant and positive relationship between Lecturer Characteristics and Business Plan Simulation Learning Effectiveness.

SIMULATION CHARACTERISTICS

As an aside, while entrepreneurship has been highlighted in the literature as an outcome in simulation game education, limited research has considered entrepreneurship (Yen & Lin 2020). The critical voices questioning simulation games as an effective learning method lead to a debate about their actual contribution to learning performance, as game-based expertise does not automatically translate into improved student learning outcomes ((Raquel et al. 2019). The learning enhanced through simulation is based on real-world scenarios and problems and develops a close connection to the workplace (Lukosch et al. 2016). These factors need to have an assessment from the student when they use simulation in entrepreneurial learning. These simulation-based learning systems may pique students' interest and encourage them to participate more actively in educational activities (Yen & Lin 2020). The simulation contents facilitate experiential learning on gaining the entrepreneurship learning outcome after the effectiveness of business plan simulation as the output. The significance of business simulation games is that they can aid in the teaching and learning process (Goi 2019). The burden of expertise is based on experience and first-class entrepreneurship. The students were able to develop their expertise mainly in the corporate world. The proposed hypotheses are as follows:

H_{A3} There is a significant and positive relationship between Simulation Characteristics and Business Plan Simulation Learning Effectiveness.

EXPERIENTIAL LEARNING

In examining the learning experience in management, Kolb and Kolb (2007) used the theory Exceptional Learning to explain management processes of teams, managers, and organisations as learning procedures to determine and solve problems, develop strategies, and exploit opportunities entrepreneurially. Experimental learning theory is a process of understanding that results from the implementation of experience (Kolb & Kolb 2008). The business plan itself is an educational experience as Malik et al. (1997) state that business plans are an experiential technique developed to enable students to build integration, analysis and decision-making skills. This business plan encompasses the entire journey from the industry to the simulation (Batko 2016). Alternatively, simulations provide a lively, interactive, and experiential learning experience that encourages students to quickly understand key concepts and build a foundation for more thorough study (Angolia et al. 2019). The flow experiences of business simulations, such as absorption, enjoyment, and motivation, explain why business simulation games facilitate learning. (Buil et al. 2018). Experiential learning is a significant factor in the learning process of entrepreneurship education. The development of a business plan is a form of experiential learning (Kuratko & Morris 2018). Combining with a business simulation method can give the most significant chances of effectiveness in entrepreneurship learning. While theoretical learning typically results in knowledge acquisition, experiential learning frequently results in students obtaining new skills and competencies (Cui et al. 2021). In entrepreneurial learning, the process depends on the input in gaining the learning effectiveness. The correct input will successfully generate experiential learning as the process of learning in transferring the knowledge. The hypotheses are as follows:

H_{A4} There is a significant and positive relationship between Experiential Learning and Business Plan Simulation Learning Effectiveness.

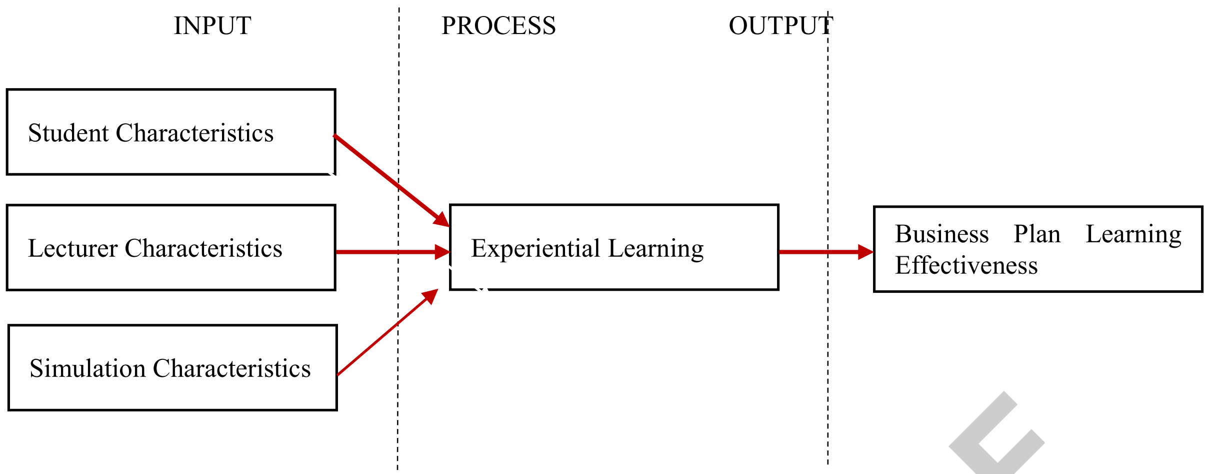

FIGURE 1. Conceptual framework in the logic model

METHODOLOGY

The researcher developed a business plan simulation to measure the factor input contributing most to the learning process. The simulation was designed using a spreadsheet (Evans 2000; Sezen & KitapÇi 2007; Freimer et al. 2004; Voelkner & Werners 2002; Guerrero 2010; and Jordan 2010). It is also implemented with Visual Basic Application, for which the simulation is interactive (Saltzman & Roeder 2013; Guerrero 2010; Williams & Klass 2007). The simulation model includes the input, process and output of the simulation, adapted from the logic model (Sorensen 2011; Kriz & Auchter 2016; Bielecki et al. 2013). Garris and Ahlers (2002) created the appropriate model for the game cycle.

DATA COLLECTION

The fitted designs of the quantitative sector were used to identify business plans and relationships between them (Vos & Brennan 2010; Abdullah et al. 2013; Ramli et al. 2018; Miller et al. 2019; Lohmann et al. 2019). Students from different entrepreneurship programs (272 students) were selected to conduct a business simulation. The students have to use elements of business simulation to facilitate the preparation of business games using computer-based simulations. They had to answer questionnaires before conducting business games and questionnaires after conducting business games. The questionnaire was intended to gather information about the opinions of business simulation students (Eder et al. 2019; Russ & Drury-Grogan 2013; Taoetal. 2012). To facilitate learning of business plans and their impact on traditional learning methods and after simulation of business plans.

QUESTIONNAIRE DEVELOPMENT

The theoretical model of this study includes five variables, and each factor is calculated for specific applications. Some previous studies have used questionnaire design and adapted all items. The questionnaire contains 33 student characteristics, lecturer characteristics, simulation content, experiential learning, and business plan learning effectiveness. Student characteristics consist of four items, lecturer characteristics consist of five items, and simulation characteristics consist of eight items, modified from (Wellington et al. 2016), experiential learning consists of eight items, modified from (Jeong & Bozkurt 2014), and business plan learning effectiveness consists of eight items, modified from (Vos & Brenman 2010; Soerenson 2011; Abdullah et. al. 2013; Gundala & Singh 2016).

POPULATION AND SAMPLING

This study identified the sample through purposive sampling. Sekaran and Bougie (2016) recommend using only purposive information from individuals with the necessary data. Chiew and Siraj (2013) use snowball sampling to study an integrative internship and business planning game in the Malaysian business studies curriculum due to the lack of address or background information. Similar to Setyono and Arnandiansyah (2018), the sample was used to determine the impact of entrepreneural simulation on business system learning outcomes. Cheng et al. (2009) also used purposive sampling to obtain information about entrepreneurial education from the target audience. Examples of this study are entrepreneurship students from undergraduate and graduate programs. These purposive samples are intended for specific students taking a course in entrepreneurship and assume that each institution followed the MQA guidelines for learning outcomes. The population is 2358, the initial number of respondents was 330; however, according to Ramayah et al. (2017), it suggests using GPower to calculate sample size when they have the effect size and power size. Wellington et al. (2016) and Jos (2017) use Gpower for business simulation to determine sampling numbers with 0.80 power and 0.35 effect size. For this study, the GPower generate a 272 sample size.

BUSINESS PLAN SIMULATION

Each business plan includes four components: organisational planning, operational/production planning, marketing planning, and financial planning. (Ibrahim et al. 2013; Tiwari et al. 2014; Ruszkowska & Marcin 2016). The Business Plan Simulation is a combination of business plan and business simulation. The purpose of simulation design is base on the four business functions. The player who uses this simulation will be tested on each function's knowledge and skill requirements. This business plan simulation develops using Visual Basic Application (VBA) on excel. The process flow of business plan simulation consists of the daily operation of the business organisation. To start a business, a business owner must know the requirement of business activities, such as determining the source of material to produce the product, selecting the right marketing channel to promote the product, and recording financial inflow outflow to prepare for the statement. The business plan simulation flows is briefly listed below:

1. A brief explanation of the simulation
2. Participants register team members and select types of business
3. The team decide to pay the items for administration, marketing and operation
4. The team start to run business by selling products and pay for every expense quarterly in a year
5. View the result by refer to the financial report for four months in a year
6. Take corrective action based on current performance before starting another quarter business operation
7. Simulation end until the participant reaches the 4th quarter winner determines by teams that achieved strong financial performance

DATA ANALYSIS

The respondent's academic background is also crucial for the method, as it determines the understanding and preciseness of their learning. As shown in Table 1, 49.6 per cent of respondents are in the engineering background, 34.2 per cent for business and management background and 16.2 per cent for other backgrounds. A higher number of respondents from a private institution, 56.2 per cent, compared to public institutions, 43.8 per cent

TABLE 1. Table test of normality

Measure	Items	Frequency	Percentage
Gender	Male	**167**	**61.4**
	Female	105	38.6
Age	<20 years	67	24.6
	20-25 years	**194**	**71.3**
	26-30 years	11	4.0
Education	SPM	80	20.8
	Diploma	**136**	**35.4**
	Foundation/Matriculation	47	12.2
	STPM	16	4.2
	Bachelor's degree	**105**	**27.3**
Program	Entrepreneurship	19	7.0
	Business Study	26	9.6
	Management	48	17.6
	Engineering	**135**	**49.6**
	Others	44	16.2
Institution	Public	168	43.8
	Private	**216**	**56.2**

Data and outliers were tested for detection, reliability and normality (Table 2). SmartPLS evaluated the measurement model through the Structural Equation Model for confirmatory factor analysis and a structural equation model (SEM). As SEM technique, Partial Least Square (PLS) is used to reduce the regression-based techniques, assuming that the test models are simple and measure some indicators' structure (Haenlein and Kaplan, 2004). Noor et al. (2018) used SmartPLS as a tool to analyse the magnitude of path coefficients using the PLS-SEM algorithm in their study on business simulation and entrepreneurship. They investigated the significance of the relationship between variables by bootstrapping PLS-SEM. SmartPLS was selected to evaluate the reliability and validity of the structure. The average variance extracted (AVE), Composite Reliability (CR), Cronbach's alpha (CA), communities, and redundancy were estimated using Deranek et al. (2019) to evaluate the psychometric properties of the model. The Cronbach's alpha assesses the reliability of a set of variables in a coherent latent structure. A PLS-SEM Confirmatory Factor Analysis (CFA) was used to test the convergent and distinct validity of the study model (Noor et al., 2018).

Cross-loading helps assess whether the building has sufficient discriminant validity by comparing the correlation between construct indicators and other buildings. If the correlation between the construct indicators and other constructs has a higher value than the correlation between these indicators, the construct is highly discriminant. Another way to measure the discriminant validity between the indicator and the construct can be seen from AVE (0.50). Table 3 shows the cross-loading of the variables. To evaluate the discriminant validity (the parameter showing that each variable explains more of the variance of its indicators than the other constructs Maria et al. (2016) suggest using HTMT.

TABLE 2. Table test of normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Treatment	Statistic	df	Sig.	Statistic	df	Sig.
Effectiveness	Treatment	.118	171	.000	.952	171	.000
	Control	.099	170	.000	.939	170	.000

a. Lilliefors Significance Correction

TABLE 3. Cross loadings

Cross Loadings	Experiential Learning (EL)	Learning Effectiveness (LE)	Lecturer Characteristics (LC)	Simulation Content (SMC)	Student Characteristics (SC)
EL_1	0.748	0.566	0.511	0.583	0.526
EL_2	0.657	0.490	0.442	0.392	0.521
EL_3	0.722	0.546	0.430	0.515	0.444
EL_4	0.764	0.553	0.527	0.547	0.525
EL_5	0.793	0.655	0.585	0.609	0.583
EL_6	0.778	0.605	0.571	0.563	0.501
EL_7	0.773	0.692	0.579	0.574	0.546
EL_8	0.743	0.624	0.501	0.523	0.467
LC_1	0.465	0.507	0.753	0.602	0.506
LC_2	0.578	0.548	0.803	0.572	0.547
LC_3	0.558	0.510	0.801	0.559	0.538
LC_4	0.605	0.568	0.826	0.612	0.505
LC_5	0.567	0.568	0.810	0.579	0.505
LE_1	0.614	0.687	0.502	0.490	0.472
LE_2	0.559	0.716	0.457	0.443	0.480
LE_3	0.593	0.769	0.531	0.518	0.581
LE_4	0.686	0.808	0.587	0.586	0.561
LE_5	0.646	0.820	0.552	0.551	0.586
LE_6	0.523	0.738	0.435	0.464	0.554
LE_7	0.632	0.783	0.548	0.591	0.506
LE_8	0.581	0.780	0.499	0.575	0.552
SC_1	0.445	0.503	0.486	0.456	0.707
SC_2	0.553	0.569	0.562	0.558	0.825
SC_3	0.525	0.503	0.484	0.466	0.789
SC_4	0.624	0.628	0.519	0.581	0.825
SMC_1	0.531	0.514	0.562	0.764	0.451
SMC_2	0.570	0.538	0.572	0.780	0.470
SMC_3	0.463	0.451	0.475	0.697	0.484
SMC_4	0.513	0.508	0.514	0.739	0.420
SMC_5	0.563	0.492	0.505	0.768	0.476
SMC_6	0.498	0.509	0.522	0.764	0.548
SMC_7	0.533	0.543	0.559	0.741	0.482
SMC_8	0.650	0.595	0.657	0.758	0.604

Confirmatory factor analysis was used to evaluate the item and cross-loadings. Since cognitive absorption is considered second-order in a theoretical model, special procedures must be followed. For this, Wilson and Henseler (2007) found a two-step approach and the method used by Agarwal and Karahanna (2000). The same procedure was adopted for the research theory test. First, the PLS analysis is performed without the second-order, and the value of the latent variable is used in the following calculations. The latent variable is also used as input to a separate model that includes the second order, and the CFA is performed using this model. Table 4 for the reflection items shows the CFA results.

TABLE 4. Reflective indicator item cross-loading and CFA

	Items	Loadings[a]	AVE[b]	CR[C]	Rho_A[d]
Lecturer Characteristics	LC_1	0.753	0.560	0.910	0.891
(LC)	LC_2	0.803			
	LC_3	0.801			
	LC_4	0.826			
	LC_5	0.810			
Student Characteristics	SC_1	0.707	0.620	0.867	0.808
(SC)	SC_2	0.825			
	SC_3	0.789			
	SC_4	0.825			
Simulation Contents	SMC_1	0.764	0.565	0.912	0.893
(SMC)	SMC_2	0.780			
	SMC_3	0.697			
	SMC_4	0.739			
	SMC_5	0.768			
	SMC_6	0.764			
	SMC_7	0.741			
	SMC_8	0.758			
Experiential Learning	EL_1	0.748	0.560	0.910	0.891
(EL)	EL_2	0.657			
	EL_3	0.722			
	EL_4	0.764			
	EL_5	0.793			
	EL_6	0.778			
	EL_7	0.773			
	EL_8	0.743			
Learning Effectiveness	LE_1	0.687	0.583	0.918	0.900
(LE)	LE_2	0.716			
	LE_3	0.769			
	LE_4	0.808			
	LE_5	0.820			
	LE_6	0.738			
	LE_7	0.783			
	LE_8	0.780			

The values in Table 5 indicate discriminant validity problems based on the HTMT 0.85 test criterion. Only the learning efficiency-experience-learning structure shows the value of 0.85, indicating that the HTMT criterion identifies the collinearity problems of the latent construct (multicollinearity). The forms learning efficiency-experiential learning, learning efficiency-readership characteristics, learning efficiency-simulation content, learning efficiency-readership characteristics, learning efficiency-simulation content, and lecturer-simulation content. Most of the building blocks probably measure the same thing. They contain overlapping elements of respondents' views of the structures concerned.

TABLE 5. SmartPLS report on discriminant validity (heterotrait-monotrait, HTMT)

	Experiential Learning	Learning Effectiveness	Lecturer Characteristic	Simulation Content
Experiential Learning				
Learning Effectiveness	0.883			
Lecturer Characteristic	0.791	0.767		
Simulation Content	0.804	0.770	0.831	
Student Characteristics	0.811	0.828	0.789	0.773

RESULT

In this section, we bootstrap using SmartPLS 3.2.8 to observe the proposed proposition. As shown in Table 6 and Figure 2, we propose three hypotheses. All input variables that connect with the experiential variable record the same R Square that is 0.629.

TABLE 6. Hypothesis result on Business Plan Simulation Model from SmartPLS

Hypothesis	Relationship	Effects	Std. Beta	|t-value|^	Decision	f^2	q^2	r^2	p values
H1	SC -> EL	Direct	0.301	4.749	Support	0.120	0.034	0.629	0.000
	SC -> LE	Indirect	0.173	3.953		0.120		0.629	0.000
H2	LC -> EL	Direct	0.254	4.202	Support	0.071	0.019	0.629	0.000
	LC -> LE	Indirect	0.161	4.173		0.071		0.629	0.000
H3	SMC -> EL	Direct	0.342	4.378	Support	0.129	0.037	0.629	0.000
	SMC -> LE	Indirect	0.359	6.707		0.129		0.629	0.000

SC – Student Characteristics, LC– Lecturer Characteristics, SMC – Simulation Content., EL- Experiential Learning, LE – Learning Effectiveness.

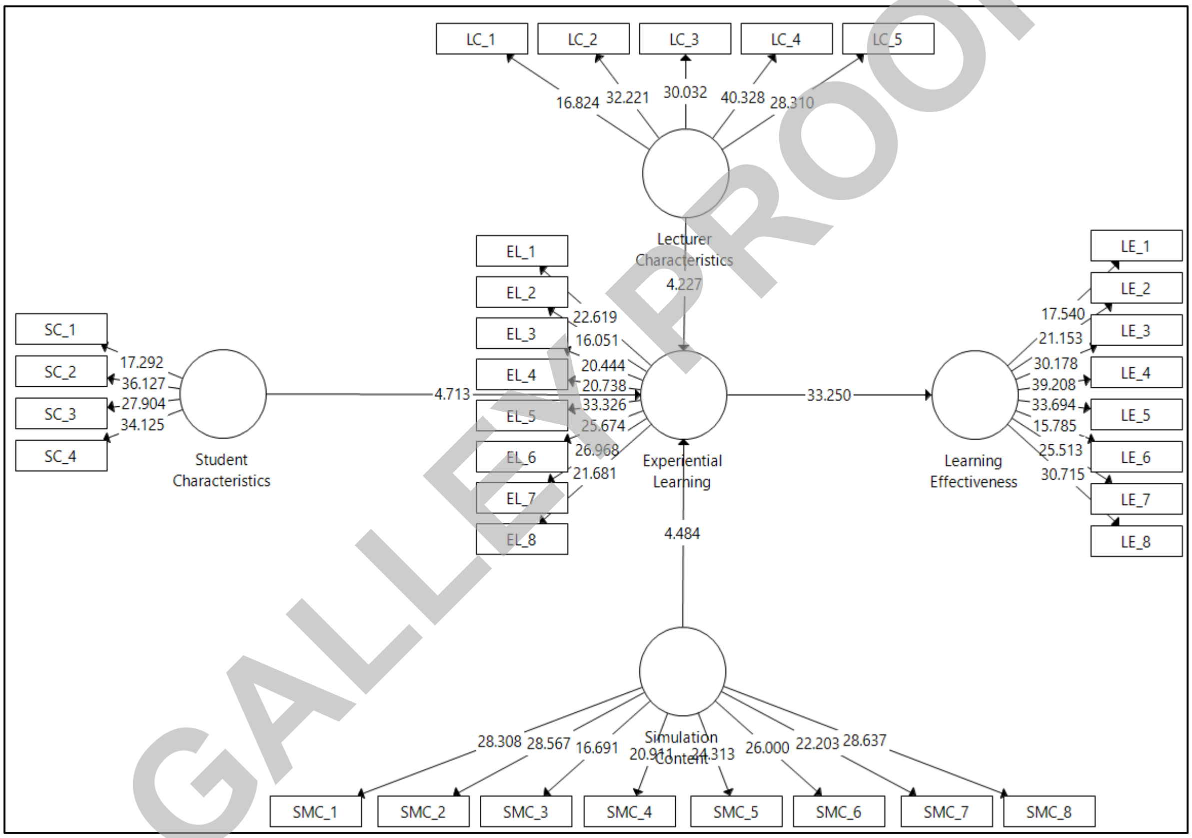

FIGURE 2. Factor analysis of the Logic Model

Figure 2 shows factor analysis of the Logic Model Structural Equation Model . This model is the PLS bootstrapping SmartPLS calculation. The factor analysis shows that the total path value t is 1.96. Based on the bootstrap projections for direct relationships, confidence intervals can be constructed for indirect relationships such as indirect effects and total effects (Streukens & Leroi-werelds 2016). For indirect effects, Idrus et al. (2018) report that the hypothesis is tested along with the direct effects test, with bootstrapping processed using SmartPLS 3.2.8. In this study, the researchers decided to support the hypothesis by using the indirect effect of determining the relationship of the logic model (Input-Process-Output) through the process (in this case, experience) (learning effectiveness). The findings of the PLS path modelling evaluation are shown in Table 6. Every study model is inspected to check for an indirect effect and calculate the number of effects (Streukens & Leroi-werelds 2016).

For the first hypothesis, the results indicate that there is a significant relationship between student characteristics and business learning effectiveness via an indirect effect (β = 0.173, t = 3.953, p < 0.05, f^2 = 0.120) and also a significant direct effect through experiential learning (β = 0.301, t = 4.749, p < 0.05, f^2 = 0.120). This finding is similar to research conduct by Palmunen et al. (2013), Sorensen (2011), Han et al. (2011); Wawer et al. (2010); and Tao et al. (2009). For H_2, the results indicate that the hypothesis is significant that lecturer characteristics have a relationship and positively influence the effectiveness of business game learning with an indirect effect (β = 0.161, t = 4.173, p 0.05, f^2 = 0.071). Since the critical ratio (t-value) is above 1.96, indicating that the path is significant at the 0.5 level, the lecturer characteristics are determined to be a significant factor influencing the effectiveness of the business simulation method. The result produces a similarity with the previous findings indicated that lecturer contribution would positively affect business simulation effectiveness (Kikot et al., 2013). The results obtained for H_3 show a significant relationship between the business simulation content and its learning effectiveness via an indirect effect (β = 0.359, t = 6.707, p 0.05, f^2 = 0.037) within the direct effect. Moreover, for the direct effect through experiential learning (β = 0.342, t = 4.378, p < 0.05, f^2 = 0.037), the critical value (t-value) is above 1.96, indicating that this relationship is statistically significant. Tiwari et al. (2014) findings also supported the relationship between simulation content and learning effectiveness.

TABLE 7. Hypothesis result in the mediation effect

Hypothesis	Relationship	Std. Beta	|t-value|^	Decision	f^2	q^2	r^2	p values
H_4	EL -> LE	0.572	11.033	Support	0.420	0.044	0.670	0.000

EL- Experiential Learning, LE – Learning Effectiveness.

Table 5 shows that the results support the hypothesis of the mediation effect. This result is different from Table 4 because experiential learning is the process of the Logic Model. The results indicate that there is a significant relationship between experiential learning and corporate learning effectiveness (β = 0.572, t = 11.033, p < 0.05, f^2 = 0.420). The results also show that Business Plan Simulation requires a certain level of learning for experiential learning to have a 67.0% impact on learning effectiveness. Since the critical ratio (t-value) is above 1.96, the path is significant at the 0.05 level, and experiential learning significantly influences learning effectiveness. The f^2 (effect size) =0.420 for the predictive value of experiential learning on learning effectiveness indicates that experiential learning has a large effect on creating the R^2 for learning effectiveness. The result of the finding is similar to research conduct by Loukis et al. (2014) in that they found experience generation (experiential learning categories) has a significant relationship with affective evaluation (part of learning outcome effectiveness).

DISCUSSION AND CONCLUSION

The business plan simulation requires four factors that play a role in the Logic Model to facilitate learning in the business plan. The factors include experiential learning (process) and input, which are the characteristics of the teacher, the characteristics of the students, and the content of the simulation. All four elements show a positive relationship with the effectiveness of learning in the Logic Model. As explained in the last section, the factors are classified as independent variables and mediating variables. Experiential learning in the Logic Model process is the variable referred to as mediating. In contrast, the other factors are labelled as independent variables as inputs in the logic model. The factors are measured to facilitate the output by placing the output of the logic model based on the learning efficiency.

With a score of 62.9 per cent for simulation effectiveness, the list of student characteristics is the third component contributing to a favourable association between learning and learning outcomes. The learning outcome for each student in a programme determines, as one element, the success of the method used in imparting knowledge. Students may acquire a desire for learning outcomes towards the end of the course. They serve as inputs into the logic model to determine his learning performance in the same model. This situation is different from the lecturer's skills, which involve only the input and process of the logic model. The lecturer's skills do not include the output of any particular learning at the end of the course. The student characteristics include the three-level logic model of the learning model: the input factor, the process, and the output performance factor. The analysis results indicate that performance (f^2) is 12% for students compared to teachers, where the effect of the performance is only 7.1%. With an effect of 62.9% on the effectiveness of business plan simulation, the lecturer's presence in the simulation approach accounts for the primary input in a business plan simulation, making learning more effective.

In contrast to the process, the characteristics of the lecturer as input in the logical model are the first to enable the learning process even in the traditional method (lecture). The lecturer determines the way students perceive the knowledge imparted. The student uses a high-quality lecture from the example lecturer to learn quickly. Students often choose a cooperative, easy lecturer instead of a strict lecturer. Traditional learning that depends on the teacher is insufficient; student-centred learning allows students to learn independently with other supportive learning materials. Therefore, creative lecturers need to consider knowledge technology support. Lecturer characteristics include training, motivation, expectation, and preparation.

Even simulation content is the final factor that determines the effectiveness of learning in business plans. The effect size is identical with the characteristics of lecturer and students, which have 62.9%. Nevertheless, the simulation content's effect size (f^2) is 12.9% higher than the other input. The content of the simulation game is one of the critical factors in determining how the learning process is conducted. The simulation environment is the primary input to get students to use and learn the method. Business Plan Simulation determines the simulation content because it shows how the environment can meet the requirements and become a source of experiential learning. This research emphasises the independent variables, including lecturer characteristics, student characteristics, and simulation content with the variable mediation (experiential learning). As listed in Table 7 in the analysis section, all variables support the research hypothesis. These factors also answer the second research question and determine the factors and processes in Business Plan Simulation modules that contribute to learning enhancement. The results also show that both analysis software, led by the experiential learning factor, follow the lecturer characteristics, student characteristics, and simulation content. This result helps to establish that experiential learning plays a significant role in facilitating learning in the business plan simulation process. The so-called contribution mainly facilitates the simulation of the business plan, which leads to the method's efficiency. All the findings support the hypothesis as a factor in business plan simulation that plays a role in facilitating effective learning. The results and findings of the research analysis and discussion of the previous chapter show: -.

1. The positive relationship between the logic model's input (student characteristics, lecturer characteristics, and simulation content) and output (learning efficacy of business simulation), as determined by the logic model's mediation process.
2. The positive relationship between the logic model (experiential learning) and the logic model output; (Business Plan Simulation learning effectiveness).

THEORETICAL IMPLICATION

Implementing a Business Plan Simulation requires a solid foundation to support implementation and achieve effectiveness at the end of the course. The foundation of the logic model, including inputs, processes and outputs, is then extended to the outcomes of the learning process. One of them is fostering entrepreneurship among participants and developing future entrepreneurs as the main outcomes in entrepreneurship. The outcomes will not be achieved if the process factor Logic Model does not match the desired outcome of the course. At the same time, the outcome requires the participant to plan his business efficiently by writing the business plan correctly in the business plan simulation. The inputs, which include the characteristics of the students and lecturers, continue to be crucial for defining the critical part and substance of the simulations and determining the source of the significant process and, eventually, for determining the outcome. Experiential education generates input for an output in the logical model that allows the student to experience the reproduction of the real business environment. Experiential learning also teaches students how to make decisions and solve the problem in business simulations. This training allows students to experience the risk in decision making and problem solving before entering the real world.

PRACTICAL IMPLICATION

The practical implications for future entrepreneurs and managers are also obtained through this study. Our research shows that participant characteristics and guidance with relevant content in business simulation contribute to strong learning and training effectiveness. Therefore, there is a need to conduct business simulations as practice and training for planning future business. Secondly, experiential learning also acts as a mediating factor that fulfils learning by experiencing the simulation environment to create awareness and knowledge. With this integration of the Logic Model element in conducting business plan simulation, future entrepreneurs and managers will be adequately prepared to plan and launch new businesses and opportunities.

LIMITATION OF THE STUDY

This research has some limitations that need to be considered for future studies. First, this study was conducted in selected higher education institutions. Therefore, there is a need for further research in other higher educational institutions. Secondly, only one business plan simulation method was used in the current study, which is based on spreadsheet VBA, and there is a need to investigate business plan simulation on an online basis. Thirdly, this study used Logic Model as the element basis. In the future, there is a need to investigate other models that measure the behaviour of the user of this business plan simulation.

REFERENCES

Angolia, M., Reed, A. H. & Angolia, M., 2019. A case for early semester utilisation of business simulations. *Journal of Applied Research in Higher Education* 11(1): 90–101.

Buil, I., Catalán, S. & Martínez, E., 2018. Exploring students' flow experiences in business simulation games. *Journal of Computer Assisted Learning* 34(2): 183–192.

Cui, J., Sun, J. & Bell, R., 2021. The impact of entrepreneurship education on the entrepreneurial mindset of college students in China: The mediating role of inspiration and the role of educational attributes. *International Journal of Management Education* 19(1): 100296.

Duval-Couetil, N., Shartrand, A. & Reed, T. 2016. The role of entrepreneurship program models and experiential activities on engineering student outcomes. *Advances in Engineering Education* 5(1).

Farashahi, M. & Tajeddin, M., 2018. Effectiveness of teaching methods in business education: A comparison study on the learning outcomes of lectures, case studies and simulations. *International Journal of Management Education* 16(1): 131–142.

Garris, R. & Ahlers, R., 2002. A research and practice model. *Simulation and Gaming* 33(4): 441–467.

Goi, C.L. 2019. The use of business simulation games in teaching and learning. *Journal of Education for Business* 94(5): 342–349.

Hall, J.J.S.B. 2014. Quality assurance in business simulation design. *The Association for Business Simulation and Experiential learning* 41: 85–95.

Han, S., Cai, J., Liu, X. & Wang, Q. 2011. What can students learn by playing business simulation game: An empirical study in China. *2011 International Conference on E-Business and E-Government (ICEE)*, 1–4.

Hense, J., Kriz, W. C. & Wolfe, J., 2009. Putting Theory-Oriented Evaluation Into Practice A Logic Model Approach for Evaluating SIMGAME. *Simulation & Gaming* 40(1): 110–133.

Ibrahim, A., Mohamad Shatar, S., Ahmad Tajuddin, O., Mohamed Yaziz, A., Rahmat, W. & Faudziah, M.D., 2013. *Modul Teras Keusahawanan*, Majlis Kokurikulum Universiti-Universiti Malaysia (UniCC), Jabatan Pengajian Tinggi, Malaysia.

Idrus, S. Al, Ahmar, A. S. & Idrus, S. Al, 2018. The effect of organisational learning on market orientation moderated by job satisfaction. *Cogent Business & Management* 5(1): 1–12.

Jabatan Pendidikan Tinggi. 2017. Dasar Pembangunan Keusahawanan.

Jabatan Pendidikan Tinggi. 2020. *Panduan Pendidikan Keusahawanan Bersepadu (Entrepreneurship Intergrated Education)*,

Jos, A. 2017. Simulation and learning dynamics in business games. *Mackenzie Management Review* 18(2): 49–79.

Kikot, T., Costa, G., Magalhães, R. & Fernandes, S. 2013. Simulation games as tools for integrative dynamic learning: The case of the management course at the University of Algarve. *Procedia Technology* 9:11–21.

Kriz, W.C. & Auchter, E. 2016. 10 years of evaluation research into gaming simulation for German entrepreneurship and a new study on its long-term effects. *Simulation & Gaming* 47(2): 179–205.

Kriz, W.C., Eiselen, T. & Manahl, W. 2014. The shift from teaching to learning: Individual, collective and organizational learning through gaming simulation. In *Proceedings of the 45th Conference of the International Simulation and Gaming Association*.

Kuratko, D.F. & Morris, M.H. 2018. Corporate entrepreneurship: A critical challenge for educators and researchers. *Entrepreneurship Education and Pedagogy* 1: 42–60.

Lackéus, M. & Middleton, K.W., 2018. Assessing experiential entrepreneurship education: Key insights from five methods in use at a venture creation programme. In *Experiential Learning for Entrepreneurship*, edited by D. Hyams-Ssekasi & E. F. Caldwell, 19-49. Switzerland: Palgrave Macmillan.

Laine, K., Tynjälä, P., Eteläpelto, A. & Hämäläinen, R. 2019. Students' self-reported learning outcomes after a business start-up education program. *International Journal of Training Research* 17(2): 98–115.
Lohmann, G., Pratt, M.A., Benckendorff, P., Strickland, P., Reynolds, P. & Whitelaw, P.A., 2019. Online business simulations: authentic teamwork, learning outcomes, and satisfaction. *Higher Education* 77(3): 455–472.
Loukis, E., Trivedi, R. & Ranchhod, A. 2014. Evaluating the educational effectiveness of simulation games : A value generation model. *Information Sciences* 264: 75–90.
Lukosch, H., Kurapati, S., Groen, D. & Verbraeck, A. 2016. Microgames for Situated Learning: A case study in interdependent planning. *Simulation and Gaming* 47(3): 346–367.
Mani, M. 2018. Aspects of entrepreneurship education in higher education institutes. *2017 10th International Conference on Contemporary Computing, IC3 2017*, 2018-Janua(August), 1–3.
Maria, J., Maria, C. & Lazaro, R. 2016. Clearing the hurdles in the entreoreneurial race: The role of resilience in entrepreneurship education. *Academy of Management Learning & Education* 18: 457-483.
Mukesh, H.V., Pillai, K.R. & Mamman, J. 2019. Action-embedded pedagogy in entrepreneurship education: An experimental enquiry. *Studies in Higher Education* 0(0): 1–15.
Nabi, G., LiñáN, F., Fayolle, A., Krueger, N. & Walmsley, A., 2017. The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning and Education* 16(2): 277–299.
Neck, H. M. & Corbett, A.C. 2018. The Scholarship of Teaching and Learning Entrepreneurship. *Entrepreneurship Education and Pedagogy* 1: 8–41.
Noor, M., Shariff, M., Shabbir, M. S., Shukri, M. & Bakar, B., 2018. The mediating role of business simulations on the relationship between University role entrepreneurship curriculum and assessment of teaching approaches and entrepreneurial inclination. *International Journal of Supply Chain Management* 7(4): 223–233.
Palmunen, L.-M., Pelto, E., Paalumäki, a. & Lainema, T. 2013. Formation of novice business students' mental models through simulation gaming. *Simulation & Gaming* 44(6): 846–868.
Ramayah, T., Yeap, J.A.L., Ahmad, N.H., Halim, H.A. & Rahman, S.A., 2017. Testing a confirmatory model of Facebook usage in SmartPLS using Consistent PLS. *International Journal of Business and Innovation* 3(2): 1–14.
Ramli, A., Shabbir, M. S., Shukri, M., Bakar, B., Mohd, P. & Mohd, N. 2018. Mediating role of e-learning resources in developing entrepreneurial mediating role of e-learning resources in developing entrepreneurial inclinations amongst undergraduate students at Universiti Utara Malaysia. *International Journal of Engineering & Technology* 7: 51–56.
Raquel, F., Beatriz, A. & Enric, L.S. 2019. Entrepreneurial competences in a higher education business plan course. *Education and Training* 61(7–8): 850–869.
Rogmans, T. & Abaza, W. 2019. The impact of international business strategy simulation games on student engagement. *Simulation and Gaming* 50(3): 393–407.
Ruszkowska, A. & Marcin, W. 2016. Process - oriented research method for teamwork effectiveness assessment in business simulation games. *Developments in Business Simulation and Experiential Learning* 43: 233–239.
Sekaran, U. & Bougie, R. 2016. *Research Methods for Business*. 7th ed. United Kingdom: Wiley.
Shneor, R., Smith, J.B., Smith, C.G. & Michael Goedecke, J.F. 2020. The differential impact of entrepreneurship education on the entrepreneurial intentions of segments of students. *Entrepreneurship Education and Pedagogy*.
Sorensen, M. 2011. Learning with simulation games - Evaluating hotel simulation games' effectiveness on higher academic performance within service and hospitality. Available at https://research.cbs.dk/da/studentProjects/c27e2858-de0c-4677-b7a8-135ae9708ce6
Streukens, S. & Leroi-werelds, S. 2016. Bootstrapping and PLS-SEM: A step-by-step guide to get more out of your bootstrap results. *European Management Journal* 34(6): 618-632.
Tao, Y.H., Cheng, C.J. & Sun, S.Y. 2009. What influences college students to continue using business simulation games? The Taiwan experience. *Computers and Education* 53(3): 929–939.
Tiwari, S.R., Nafees, L. & Krishnan, O. 2014. Simulation as a pedagogical tool: Measurement of impact on perceived effective learning. *International Journal of Management Education* 12(3): 260–270.
Vlachopoulos, D. & Makri, A. 2017. The effect of games and simulations on higher education: A systematic literature review. *International Journal of Educational Technology in Higher Education* 14: 1-33.
Wang, J. & Yang, L., 2018. Entrepreneurship education based on experiential teaching reform. In *Advances in Social Science, Education and Humanities Research (ASSEHR)* 199: 350–355.
Wawer, M., Miloz, M., Muryjas, P. & Rzemieniak, M. 2010. Business simulation games in forming of students' entrepreneurship. *International Journal of Economics and Management Sciences (IJEMS)* 3(1): 49-71.
Wellington, W.J., Hutchinson, D.B. & Faria, A.J. 2016. Measuring the impact of a marketing simulation game:

Experience on perceived indecisiveness. *Simulation & Gaming* 48(1): 56–80.
Wolfe, J. 2016. Assuring business school learning with games. *Simulation and Gaming* 47(2): 206–227.
Yasin, N. & Hafeez, K. 2018. Enterprise Simulation Gaming: Effective Practices for Assessing Student Learning with SimVenture Classic and VentureBlocks. In *Experiential Learning for Entrepreneurship: Theoretical and Practical Perspectives on Enterprise Education*, edited by D. Hyams-Ssekasi & E.F. Caldwell, 51-69. Switzerland: Palgrave Macmillan.
Yen, W.C. & Lin, H.H. 2020. Investigating the effect of flow experience on learning performance and entrepreneurial self-efficacy in a business simulation systems context. *Interactive Learning Environments* 0(0): 1–16.
Zainuddin, M.N., Mukhtar, D., Hasan, N.A. & Ali, M.H., 2019. Entrepreneurial passion development: The interplay between heuristic thinking and pedagogical experience during entrepreneurial learning. *Jurnal Pengurusan* 55: 59–72.

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