

## **21<sup>ST</sup> CENTURY SKILLS DEVELOPMENT THROUGH BUSINESS SIMULATION GAMES**

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### **ABSTRACT**

This study aims to determine the impacts of business simulation games as a tool of experiential learning toward development of 21st century skills among Ungku Omar Polytechnic (PUO) students. The questionnaire was distributed to 50 participants of the MonsoonSIM training. The result show that student's skill regarding integrated learning, decision-making and problem solving has increase significantly after being exposed to use business simulation game (MonsoonSIM). It also shows that when students use business simulation game, students are exposed to experiential learning that encourages student development of 21st century skills.

**Keywords:** Business simulation games, 21st century skills.

### **1.0 INTRODUCTION**

The rapid changes of knowledge have developed the new model of education for future. The emergence of the concept of Industrial Revolution (IR 4.0) has changed the landscape of educational. Due to the IR 4.0, 5.1 million jobs will be lost before 2020 because of dependency of artificial intelligence, robotics, nanotechnology and socioeconomic that replace the need of human workers (Forum, 2016). In order to succeed in IR 4.0 evolution, students will need digital age proficiencies. It is crucially important for the educational system to make parallel changes in order to fulfill its mission in society. Therefore, the educational system must understand and embrace the following 21st century skills within the context of rigorous academic standards (Osman, Tuan, & Nurazidawati, 2010).

This study aims to determine the impacts of business simulation games as a tool of experiential learning toward development of 21st century skills among Ungku Omar Polytechnic (PUO) students. Therefore, in this study, MonsoonSIM was chosen because this type of enterprise resource planning (ERP) simulation was recently introduced to the market (Shafudin, 2018). MonsoonSIM is a unique, experiential learning pedagogical platform for business studies. The concepts that covered by MonsoonSIM including business and economy fundamentals, business operational management, ERP and logistics and supply chain management (SCM) (Ltd, n.d.).

#### **1.1 Business simulation games**

Nowadays, business simulation games are becoming popular tool in education and business. There are many beneficial skills that can be learned by the participants such as teamwork, analytical thinking, communication, as well as active individual engagement. According to Robin Bell and Mark Loon (Robin Bell & Mark Loon, 2015), business simulation can provide a valuable tool of teaching and it also provide the opportunity to develop higher order thinking through the development of critical and strategic thinking skills. Business simulation games also a method of teaching or learning based on an actual situation (Blazic & Novak, 2015). Shalini Rahul Tiwari, Lubna Nafees and Omkumar Krishnan (Shalini Rahul Tiwari, Lubna Nafees, & Omkumar Krishnan, 2014) stated that business simulations bridge the gap between the classroom and the real-life business decision making through experiential learning experiences.

Business simulation games are considered as one of the contemporary methods of education because through business simulation games, educator can convey the knowledge in a practical way and it increasingly imitate to the real-world situation when the business simulation games becoming more complex (Waver, Milosz, Muryjas, & Rzemieniak, 2010). Business simulations also provide an interactive learning experience that requires participants to apply what they have learned and it was risk-free environment. Through business simulation, students build relevant skills, improve conceptual knowledge and gain a better business strategy to build skills and improve performance (Solution, 2019).

The main educational aim of business games is to develop decision-making skills and a confidence with business strategies (Knotts & Keys, 1997). Business games and simulations are direct form of experiential learning. Experimental learning is a dialectical process where all concepts are subject to revision and changes through lived experiences are possible (Ceschi, Sartoni, Tacconi, & Hysenbelli, 2014). Kolb (1984) (Kolb, 1984) states that the main aspect of the learning process is based on the concrete experience. Therefore, business simulation games are one of the effective ways to improve the experience in the management of business processes in modern enterprise (Faria & Nulsen, 1996).

## 1.2 21<sup>st</sup> Century Skills

Malaysia today has changed extremely in terms of technological development. Most of work need to operate globally in order to survive the competition. This transformation has given an impact on the nature of work where the usage of high-level technology is a need to compete in the global stage. Consequently, a more flexible employees with advanced technical skills with well-developed generic skills such as creative thinking, problem solving and analytical skills are required by the employer in the industry in order to meet the challenges faced by businesses (Osman, Tuan, & Nurazidawati, 2010). 21st century skills represent characteristic of student to overcome adversity and achieve success in the workplace (Ball, Joyce, & Anderson-Butcher, 2016). 21st century learning focuses on four skills (4Cs) that should dominant by student, namely critical thinking, collaboration, communication and creativity (Norazlin Mohd Rusdin, 2018). These skills are considered appropriate to produce effective learners, workers and citizens that can participate in the knowledge economy in future society (Hilt, Riese, & Soriede, 2019). According to Alismail H.A. and McGuire P. (2015) (Alismail & McGuire, 2015), students are needed to engage in the learning environment effectively to develop 21st century skills. In that way, students will be prepared with the necessary knowledge and life skills which will help them to be successful in their careers. Samual et al. (Samuel Kai Wah Chu, Rebecca B. Reynolds, Nicole J. Tavares, Michele Natari, & Celina Wing Yi Lee, 2016) state that twenty-first century skills comprise of three domains knowledge; (1) innovation thinking, information; (2) media and ICT skills and life and (3) career skills. Binkley (Binkley, et al., 2011) was defined 21st century skills as a way of thinking, working and living in connected.

Stavroulia, Contantinou, Samantzis, Chrysanthou and Zacharatos (Stavroulia, Constantinou, Samantzis, Chrysanthou, & Zacharatos, 2015) stated that simulation games encourage the development of the 21st century skills that are considered to be important for a successful future if new generations. It was supported by Qian and Clark (Qian & Clark, 2016) where there is reason to be optimistic about the potential of using a game-based learning approach to promote 21st century skill development in the future. 21st century students must have self-direction and an ability to collaborate with individuals, groups and machines (McCoog, 2008). 21st century skills consist of twelve abilities that students need to succeed in their carrier during the Information Age which are critical thinking, creativity, collaboration, communication, information literacy, media literacy, flexibility, leadership, initiative, productivity and social skills.

## 1.3 Experiential learning

The changes in education area has given the impact on business practice. The industries are requiring students to learn from experiential learning (Summers, 2004). Experiential learning refers to the learning from the experience or learning by doing. According to Lewis and William, 1994, student would “learn by doing” applying knowledge to experience in order to develop skills (Lewis & Williams, 1994). Therefore, students who are exposed with experiential learning will develop decision-making skills, promoting teamwork, motivating students and active learning (Williams, 2011).

## 1.4 Teamwork

Teamwork, collaboration and intercultural competence among others are essential of 21st century skills (Anand & Liu, 2019). According to Yu-Yin Wang et al. (2019) (Wang, Wang, & Jian, 2019), business simulation games will assist students to improve a key competencies which are important in business environment including decision-making skills, ability to adapt to new situations, teamwork skills, communication skills, problem-solving skills and informational analysis skills. The business simulation games also stimulated interest and participant among students and was effective in encouraging teamwork skills (Rogmans & Abaza, 2019).

## 1.5 Decision making

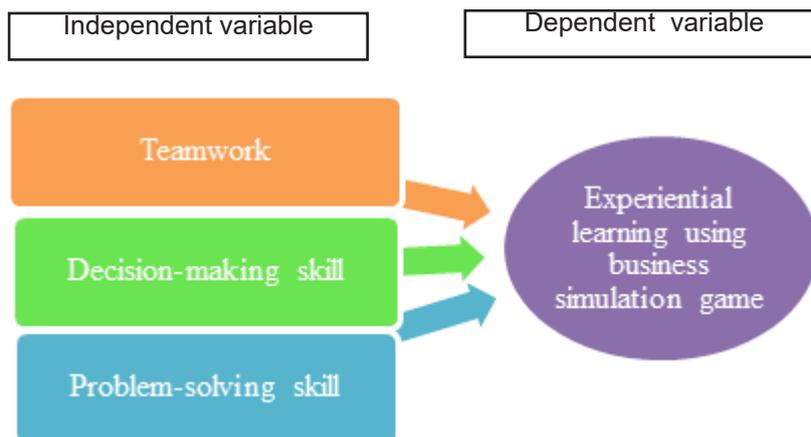
Simulation are known to enhance students' decision-making skills (Shalini Rahul Tiwari, Lubna Nafees, & Omkumar Krishnan, 2014). In attempt to improve student's decision making and analytic abilities, some business educators have used computer-based simulations (Huo, 2015). It was proved by Mohd Hizam Hanafiah et al. (Mohd Nizam, Mohd Suhaimi, & Nor Liza, 2016), that business simulation is an effective way in developing decision-making skills among students.

### 1.6 Problem solving

Business simulation games help students obtain workforce skill by enabling students to practice thinking critically, making decision and solving business problems (Caruso, 2019). According to Pray and Rabinowitz (Pray & Rabinowitz, 1989) states that business simulation provide solution for the training and development problems resolution by strengthening analytical and interpersonal skills in a single training session.

This study aims (1) to identify the level of teamwork skill, decision-making skill and problem-solving skill as independent variables and experiential learning using business simulation game as dependent variable; (2) to determine the relationship between independent variables and dependent variable.

**Figure 1: Research framework of the impact of using business simulation game toward development of 21st century skills**



## 2. METHODOLOGY

### 2.1 Research Design

A descriptive research design was employed in this study by using quantitative approach. A cross-sectional survey was carried out on experiential learning using business simulation games, teamwork skill, decision-making skill and problem-solving skill. A sample was selected by using purposive sampling. The sample consists of 50 students who attended the MonsoonSIM training at PUO. The questionnaire survey was completed through online upon the student completed the final MonsoonSIM Campus competition. The questionnaire consists of 19 questions which are adapted from existing instruments from previous researchers that measure the related variables.

The measurement items for experiential learning were adapted from the study of Mohd Guzairy et al. (2017); teamwork items from Lohmann G. et al. (Lohmann, et al., 2019); decision-making were adapted from Shalini et al. (2014); and problem solving were adapted from Mohd Guzairy et al. (2017) and Gurvinder Kaur Gurcharan Singh et al. (2008). Students were asked to respond to a number of statements with an answer on a four-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'.

This study was using SPSS version 23 to report the correlation analysis to determine the strength and direction between independent variables and dependent variable.

### 3. RESULTS AND DISCUSSIONS

#### 3.1 Mean

**Table 1: Result of the factors**

Dependent variables	Overall mean score	Interpretation
Experiential learning	3.50	High
Independent variables	Overall mean score	Interpretation
Teamwork skill	3.26	High
Decision-making skill	3.25	High
Problem-solving skill	3.27	High

From this study, the first question is to determine the level of skill using business simulation game. The interpretation given is according to Moidunny (2009) (Moidunny, 2009). Based on descriptive analysis on the Table 1, all variables mean score is high. Problem-solving skills is the higher mean with 3.27 rather than teamwork skill with 3.26 and decision-making skill with 3.25. This result is consistent with the previous finding from William which stated that students who are exposed towards experiential learning will develop the decision-making skills, teamwork and active learning. This result also supported by finding from Pray et al. states that business simulation develops problems resolution in a single training session.

#### 3.2 Correlation

The second question for this study is to examine the relationship between three independent variables towards experiential learning using business simulation game.

**Figure 2: Correlation analysis on independent variables and dependent variable**

		Mean Experiential Process	Mean Teamwork	Mean Decision making	Mean Problem solving
Mean Experiential Process	Pearson Correlation	1	.645**	.691**	.627**
	Sig. (2-tailed)		.000	.000	.000
	N	50	50	50	50
Mean Teamwork	Pearson Correlation	.645**	1	.865**	.896**
	Sig. (2-tailed)	.000		.000	.000
	N	50	50	50	50
Mean Decision making	Pearson Correlation	.691**	.865**	1	.784**
	Sig. (2-tailed)	.000	.000		.000
	N	50	50	50	50
Mean Problem solving	Pearson Correlation	.627**	.896**	.784**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	50	50	50	50

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Figure 2 shows that all independent variables are significant correlate with dependent variable. It can be concluded that the more students involve in business simulation game will increase the 21st century skills especially in problem-solving, decision-making and teamwork. This result is consistent with the study of Lewis et al. and William stated that experiential learning from business simulation game could develop a valuable skill. Mohd Guzairy et al. also proved that knowledge and skill that gain from business simulation game make student improved problem-solving and decision-making.

#### 4. CONCLUSIONS

The result obtained in this study indicate the usage of business simulation games as an experiential learning tool in education will bring the impact towards development of 21st century skills among students. Problem-solving skill, decision-making skills and cooperative skills among students are the valuable skill that needed to fulfil the demand of the industry nowadays. The more student active in business simulation games the more students will sharpen their skills.

There are two limitations in this this study. First, this study only had a small respondent because this business simulation games (MonsoonSIM) was the first time conduct in PUO. Therefore, the students' involvement in this training is relatively low. Lastly, the scope of this study was limited to PUO. Even though several polytechnics in Malaysia have used MonsoonSIM, the researcher could obtain all the information from other polytechnic due to time constraints. Thus, the results were less accurate because it was based on PUO only.

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