

# Investigating the Effectiveness of Business Simulation to Inculcate Lifelong Learning amongst Learners

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**Abstract:**-Globalization, Industrial Revolution 4.0, fast-growing AI system and the augmentation of knowledge economy had all led to the development of passion and drive to learn, unlearn, and relearn in enhancing workplace competitiveness. Modern day employers now prioritize lifelong learning and willingness to self-improvement over traditional experience, as it has become a necessity to develop competences and skills that are required for a dynamic global environment. Thus, a paradigm shift from traditional to interactive and experiential teaching-learning environment is vital to prepare learners to acquire 21st century competencies. Educational simulations, as part of experiential learning strategies, significantly enhance learning by promoting deeper engagement, improving outcomes, and fostering essential skills. Despite extensive research on their effectiveness in teaching specific and generic skills, there is limited investigation on their role in promoting lifelong learning. Addressing this gap, this study examines the impact of stock trading simulation activities on lifelong learning among participants. The research framework in this study is adapted and modified from conceptual framework on individual investors' learning behavior postulated by Kalugala. Statistical analysis revealed that participants perceived the stock trading simulation activities as significantly effective in fostering personal development, future readiness, and self-directed learning. There was a significant positive relationship between post-simulation stock trading literacy and lifelong learning in stock trading. The simulation enhanced participants' self-efficacy, lifelong learning spirit, and employability skills, confirming that educational simulations are effective tools for developing soft skills and 21st-century competencies that are essential for sustainability in a rapidly evolving workplace.

**Keywords:** *Educational simulation, future readiness, lifelong learning, personal development, self-directed learning.*

## 1. Introduction

Globalization, Industrial Revolution 4.0, fast-growing AI system and the augmentation of knowledge-based economy had led to the development of passion and drive to acquire new skills, continuous skilling, reskilling and upskilling throughout one's career span and personal life. In the rapidly changing economic, social, professional, informational, and technological demands, lifelong learning has become a prerequisite for adapting to modern day existence in one's educational progression, job landscape and personal development [8], [9], [10], [25], [30].

The fast-changing environment has diverted the educational system goals from imparting knowledge, skills, and attributes as functional members of a society to the goals of preparing and equipping students with 21st century competencies for competitiveness and sustainability in workplace challenges. Critical thinking, digital skills and

sophisticated communications skills are core competencies that are required by employers to be competitive in the ever-changing business environment [25].

A traditional teaching-learning environment provides learners with theoretical insights that are static, predictable, unchallenging, and often reduce learners' uncertainty [1], [30]. Traditional teaching-learning methods and techniques lack real-world experiences and applications to prepare learners to acquire 21st century competencies and to be competitive in the new global environment. Therefore, there is a powerful force driving a fundamental shift from traditional passive teaching and learning environments to proactive and experiential educational environments. Business simulations, game-based simulations, computerized simulations, projects and problem-based learning, live cases, service-learning projects, internships and field trips are few instances of experiential learning generally adopted by educators in higher education institutions [12], [20], [25]. Experiential teaching-learning strategies, particularly using educational simulations as an additional educational medium has become progressively prominent and valued in many programs at tertiary education [3], [6], [13], [14], [24], [29].

Educational simulations significantly promote deeper learning, enrich learning experience, enhance learning outcomes, and improve academic performance in a dynamic learning cycle [24], [32]. Past research study on educational simulations primarily focuses on the effectiveness of simulation to foster generic skills (analytical and critical thinking skills, decision-making and problem-solving skills, teamwork and leadership skills) and specific skills (academic-subject related, acquisition of theoretical knowledge on subject-area, planning and managerial skills) [14]. However, there are limited research studies on educational simulations to inculcate lifelong learning among learners.

Alvin Toffler (as cited in Keating, 2020) asserted that "The illiterate of this modern era will not be individual who lack read and write skills, but those who are unable to learn, unlearn and relearn" [16]. Keating affirmed that in this rapidly evolving environment, it is not a question of whether a robot or the AI system will render an individual obsolete, but it is the challenge of learning new and in-demand skills to stay relevant and employed [16]. In this context, the key to success in the future workplace is to embrace lifelong learning and focus on continuous acquisition of new and in-demand skills desired by organizations. Consequently, it has become a popular trend in recent years to embrace lifelong learning and lifelong employability in the competitive job landscape. It is essential to put emphasis on educational simulations to stimulate motivation to learn and to support lifelong learning in a dynamic learning cycle.

Our previous studies on the industry-led stock trading simulation namely, Inter-Varsity Stock Challenge was effective in developing awareness among participants on stock trading and successfully fostering financial literacy [20]. Furthermore, the results also revealed that stock trading simulation effectively improves and cultivates both practical and soft skills of stock trading. Stock trading simulation also serves as an influential tool to inspire and prepare learners for future employment and further academic pursuits amongst participants [21].

Further from the findings of our studies on Inter-Varsity Stock Challenge, this paper aims to investigate the effectiveness of simulated stock trading activity to inculcate lifelong learning amongst participants.

## 2. Literature Review

Based on Edgar Dale's Cone of Learning, employing active learning methods significantly enhances student's learning outcomes and stimulate greater retention of knowledge if: (i) it stimulates motivation to learn, (ii) its purpose and value of learning is clear, and (iii) there is learning by doing - practice, application, use [11]. Bloom's taxonomy depicts that moving from lower level thinking skills (knowledge, comprehension) to a more complex type of cognitive process (application, analysis, synthesis, and evaluation) demand more active learning. Educational simulations are elements of interactive learning strategy that have been demonstrated to be impactful in improving the learning process. Simulation has been productive in converting passive learning methods into active learning in the dynamic learning cycle [24], [29].

Educational simulation is an active learning method that has been asserted as engaging and effective to foster teaching-learning experiences [24], [29], [32]. Educational simulation imitates a real-life system and is especially useful in examining situations that are of high complexity, difficulty, or costly to explore in reality [22]. Gomez (as cited in Obi, Ile, & Chibuzo, 2022) affirmed that the most effective and efficient technique to develop soft skills and to acquire 21st century competencies are hands-on experiential learning exercises [25]. This provides opportunities for learners to foster self-efficacy and enhance their future preparedness in educational progression, job landscape and personal development [21], [32].

Prior literature reviews have identified 30 reasons related to the significance of using business simulation games as an effective educational tool. Goi summarized and categorized the importance of using simulations into 12 main categories [13]:

- (i) Engage creative competition in a risk-free environment
- (ii) Provide concrete experience
- (iii) Implementing analytical exercise
- (iv) Formulating strategy
- (v) Develop decision making skills
- (vi) Facilitate learning to achieve learning outcomes
- (vii) Promote collaboration and teamwork
- (viii) Stimulate motivation to learn and support lifelong learning
- (ix) Apply theoretical knowledge and concepts in a practical way
- (x) Instill active learning
- (xi) Integration of ideas to improve the effectiveness and efficiency of teaching and learning
- (xii) Provide greater teacher-student interaction to create fun and enjoyment in the learning environment

Prior research discovered the positive spillover effect from integrated educational simulation in teaching and learning strategy. Evidence from Esch *et al.* research findings indicated that faculty who engage in simulation strategy become better educators [32]. Simulation promotes student-faculty engagement and potentially creates new learning environments to stimulate more meaningful learning experience and more effective academic outcomes. Educational simulations develop higher order thinking skills and are known to significantly foster deeper learning, enrich learning experience, enhance learning outcomes and improve academic performance.

The literature on educational simulation asserted that simulations are effective tools for mediating learning - to bridge the gap between theory and practice; discovery learning; bringing course material to life, deriving by doing, real-world experience [13], [21], [23], [24], [32]. Prior research findings supported that simulations effectively increase soft skills (communication skills, creativity, teamwork, critical thinking and problem-solving skills) and hard skills (technical and discipline knowledge) [3]. These soft skills in demand skills are necessary skills required for innovation and are immensely in-demand by employers in this challenging contemporary economic and social environment.

Saeed *et al.* predicted that educational simulations and games will be one of the rapidly expanding and efficient active learning strategies adopted by educators in higher education institutions [29]. Educational simulation is an effective tool to boost self-efficacy, stimulate motivation for lifelong learning, and enhance employability skills for sustainability in the rapidly changing world. The key to success in the future workplace is to embrace lifelong learning and focus on continuous acquisition of new and in-demand skills desired by organizations. In this context, lifelong learning and self-directed learning are no longer an option but a prerequisite for adaptation to the rapidly changing environment [2], [19], [26]. It is essential to accept the necessity of lifelong learning to develop competences and skills throughout one's life by seeking knowledge not only within the formal

education system but also within the non-formal education and informal learning setting to create ability for continuous lifelong development [2], [8], [10], [19], [26], [28]. Consequently, it has become a popular trend in recent years to embrace lifelong learning and lifelong employability in the competitive job landscape.

The rapidly changing economic, social, professional, informational, and technological demands cause faster outdated of competences and skills of employees. Expectation of employers for future job candidate no longer always focus on experience, but towards lifelong learning and willingness to self-improve. Openness to new experiences and challenges, willingness to acquire new knowledge and apply it in life, workplace and academic are key competencies that are in-demand. Consequently, lifelong learning is a prerequisite for adapting to modern day existence in educational progression, job landscape and personal development [8], [9], [10], [25], [30].

Research findings of Lans *et al.* revealed that lifelong learning is essential to enhance personal capacities and personal development. The most important factor to stimulate learning is personal motivation [18]. Lans suggests that educators adopt educational simulation as a supplemental pedagogical tool to stimulate motivation to learn and further to support lifelong learning. In this modern fast-growing environment, the measure of an education institution's success is no longer how much the student knows, but it is about possessing the skills and motivation for lifelong learning [2]. There is a need to be motivated to learn, able to relate knowledge to real life changes, prepared to face changes and failures, adapting to new ideas, to network across culture, to be able to critically analyze and evaluate content, be creative in ideas and solutions. Therefore, there is a force for a paradigm shift from teacher-directed learning to self-directed learning.

Knowles define self-directed learning as a process initiated by an individual to design and analyze their learning needs and goals, create their own learning strategy to accomplish the goals, reflect and measure the learning outcomes [17]. The unique aspect of self-directed learning is the locus of control for learning that belongs to the learner in contrast to traditional learning where the control is with the teacher. Boyer *et al.* asserted that self-directed learning is a tool for lifelong learning [15]. Research findings show that self-directed learning creates motivation to develop greater level of competency and expertise, stimulate higher levels of job satisfaction and improve job performance. Self-directed learning is an essential tool for lifelong learning that helps to improve self-confidence and self-efficacy that contributes to the improvement of performance [4].

Willingness to learn, proactive and self-directed lifelong learning are key factors to sustaining long-term employability in this fast-paced and rapidly changing workplace. Lifelong learning and self-directed learning are no longer an option but a prerequisite for adaptation to the rapidly changing environment [2], [19], [26]. It is essential to accept the necessity of lifelong learning to develop competences and skills throughout one's life by seeking knowledge not only in the formal education system but also in the non-formal system and informal learning setting to create ability for continuous lifelong development [2], [8], [10], [19], [26], [28].

Santiago Iniguez De Onzono, President of IE University envisioned lifelong learning to become the fastest growing segment of higher education in the future [9]. Reasons to support lifelong learning are varied [10]:

- (i) develop new skills, reskilling, and upskilling to remain relevant throughout entire career span
- (ii) to be better functional members of a society and profession
- (iii) to maximize the quality of the workforce and to sustain long-term employability

Keating highlighted five key elements and effective methods to be a successful lifelong learner: develop a growth mindset, take responsibility for future, discover and follow one's passion, be the linchpin, surpass self and employer's expectations [16]. Lifelong learning boosts the value of an employee in the workplace, instills a higher level of self-confidence and self-efficacy, and promotes soft skills that are appreciated in the workplace [27]. In a challenging and competitive environment, lifelong learning is essential to pave the way for current and future success in one's career and personal life.

### 3. Conceptual Framework

#### Problem Statement

Globalization and the fast-changing environment drive the force to acquire new skills, continuous skilling, reskilling and upskilling to be competitive in the workplace. Expectation of employers for future job candidate no longer always focus on experience, but towards lifelong learning and willingness to self-improve. In this ever-changing global environment, lifelong learning and the ability to focus on continual learning new and in-demand skills are the key to success in the future workplace for sustaining long-term employability.

The most important employability skills are critical thinking, digital skills, communication skills, learning skills, positive attitude and behavior, and problem-solving skills. Traditional teaching-learning methods and techniques are lacking in real-world experiences and applications to prepare learners to acquire 21st century competencies and be competitive in the new global environment. Therefore, there is a powerful force driving a fundamental shift from traditional passive teaching and learning environments to proactive and experiential educational environments. Prior research study asserted that hands-on experiential learning is an effective and efficient technique to develop soft skills and to acquire 21st century competencies. Lifelong learning is no longer an option but a necessity to develop competences and skills required in the rapidly changing environment.

Research studies revealed that educational simulation is an active learning method to facilitate learning and effectively foster teaching and learning experiences. Numerous research studies have delved into and assessed the effectiveness of educational simulations to foster generic skills and specific skills. However, there are limited research studies undertaken to investigate the effectiveness of educational simulations to inculcate lifelong learning among learners. Consequently, it is relevant and significant for this research effort to fill the gap. Further from our previous studies on the industry-led stock trading simulation namely, Inter-Varsity Stock Challenge (IVSC), this paper will explore and examine the effectiveness of simulated stock trading activity to inculcate lifelong learning with regards to personal development, future readiness and self-directed learning. This research study is also in line with the United Nations Sustainable Development Goals 4: Quality Education [31]. The goal is to ensure fair and comprehensive quality education and encourage lifelong learning opportunities for everyone by 2030. It is vital to ensure all learners gain the knowledge and abilities necessary to support sustainable development, attain fulfilling employment, and secure decent jobs for everyone in the competitive workplace.

### **Purpose of Study**

In our prior research, statistical analysis indicated that simulated stock trading was effective to foster awareness of participants on stock trading and successfully stimulates financial literacy. Furthermore, the results also affirmed that stock trading simulation effectively enhances and develops participants' practical abilities in stock trading and their soft skills. Stock trading simulation also serves as a powerful tool to inspire and equip learners for future readiness in both employment and academic advancement. Further from our previous studies' findings on stock trading simulation, the purpose of this study is to investigate the effectiveness of stock trading simulation activities in inculcating lifelong learning amongst participants with regards to personal development, future readiness and self-directed learning.

Four null hypotheses and their subsidiary null hypotheses were formulated to guide the research process.

H<sub>01</sub>: There is no significant inclination towards lifelong learning with regards to personal development after the IVSC

H<sub>01a</sub>: There is no significant inclination towards lifelong learning with regards to personal development (cognitive dimension) after the IVSC

H<sub>01b</sub>: There is no significant inclination towards lifelong learning with regards to personal development (critical thinking dimension) after the IVSC

H<sub>02</sub>: There is no significant inclination towards lifelong learning with regards to future readiness after the IVSC

H<sub>02a</sub>: There is no significant inclination towards lifelong learning with regards to future readiness (future employability preparedness dimension) after the IVSC

H<sub>02b</sub>: There is no significant inclination towards lifelong learning with regards to future readiness (preparedness in progression of studies dimension) after the IVSC

H<sub>02c</sub>: There is no significant inclination towards lifelong learning with regards to future readiness (preparedness in stock investment dimension) after the IVSC

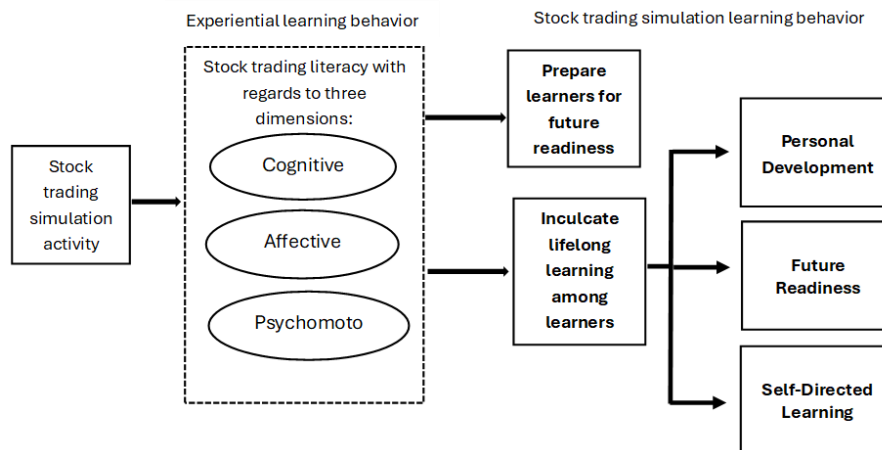
H<sub>03</sub>: There is no significant difference in the perception of self-directed learning in stock trading before and after the Inter-Varsity Stock Challenge (IVSC)

H<sub>04</sub>: There is no correlation between stock trading literacy after the Inter-Varsity Stock Challenge (IVSC) participation and lifelong learning in stock trading

### Research Framework

The proposed research framework in our previous studies on the effectiveness of stock trading simulation to inculcate stock trading literacy and to equip learners for future preparedness is expanded in this study. The proposed research framework for this study to examine the effectiveness of simulated stock trading to inculcate lifelong learning is adapted and modified from the conceptual framework on individual investors' learning behaviors by Kalugala, Chen & Gamini [15]. This conceptual framework explores the various internal and external structures that are expected to influence and foster cognitive, affective and social aspects of individual and social learning behavior.

Our previous studies' findings on the industry-led stock trading simulation namely, Inter-Varsity Stock Challenge, indicated that simulated stock trading activities effectively foster experiential learning behavior among participants. The research findings supported Kalugala *et al.* conceptual framework in the aspect of simulated stock trading effectively promoting participants' stock trading literacy across cognitive, affective and psychomotor dimensions. Stock trading simulation also acts as an influential tool to inspire and prepare learners for future employment and academic advancements. These qualities and attributes are expected to inculcate lifelong learning to enhance personal development, instill future readiness and to be self-directed learners. A set of four null hypotheses and their subsidiary null hypotheses outlined in the study's objectives are derived from the proposed research framework shown in Fig. 1.



**Fig. 1: Proposed research framework for simulated stock trading adapted and modified from the conceptual framework on individual investors' learning behavior by Kalugala et al. (2018)**

### 4. Methodology

Further from our previous studies on the effectiveness of stock trading simulation to inculcate stock trading literacy and to prepare learners for future readiness, this study investigates the effectiveness of stock trading simulation activities to inculcate lifelong learning amongst participants with regards to their personal development, future readiness and self-directed learning.

This study investigates the inclination towards lifelong learning with regards to personal development in the dimensions of cognitive and critical thinking that are core competencies valued by employers in the competitive workplace. This research also focuses on the inclination towards lifelong learning with regards to future readiness in the dimensions of preparedness in future employability, progression of studies and stock investment. It is essential to create awareness that education does not end with obtaining a degree or a job, lifelong learning is a prerequisite for adaptation to the demands of socio-economic changes. Besides that, this study also investigates the perception of stock trading simulation to foster self-directed learning among participants. Self-directed learning skills equips participants to be lifelong learners to acquire new skills, continuous skilling, reskilling and upskilling throughout a career span and personal lives. Self-directed learning is a tool for lifelong learning. In addition, this study also examines the correlation between stock trading literacy after the IVSC and life-long learning in stock trading. Stock trading literacy developed through active participation in stock trading simulation is expected to stimulate motivation to learn and to support lifelong learning.

The Inter-Varsity Stock Challenge (IVSC), an industry-led stock trading simulation was a real-world stock trading executed in real time based on Bursa Malaysia trading hours and transactions. This stock trading competition was opened to university/college and high school students to trade virtually for a period of 3 months. Each participating team was allocated an initial virtual capital of RM100,000 for the real-time virtual investment. The judging criteria were 70% on profit gain from the real-time virtual investment portfolio value and 30% on the investment principles and strategies that were presented to the panel of judges comprising of industry leaders in the financial markets during the finals.

A total of 70 participants responded to the online questionnaire. The respondents were from various educational backgrounds studying in various programs from universities, colleges, and high schools. The questionnaire was divided into 3 main aspects, which are personal development, future readiness, and self-directed learning. The questionnaires consist of 68 items of online survey questions which are designed using 5 points Likert scales from strongly disagree, kind of disagree, kind of agree, agree, to strongly agree.

The data collected from the online questionnaire which was tabulated in Google Sheets was converted into CSV format. This data was analyzed using the Statistical Package for the Social Sciences (IBM SPSS, version 25).

## 5. Results

The purpose of this study is to investigate the effectiveness of stock trading simulation activities to inculcate lifelong learning amongst participants with regards to personal development, future readiness and self-directed learning. Four null hypotheses and their subsidiary null hypotheses were formulated to guide the research process, were tested and the findings are in the following section.

### Testing of Null Hypothesis 1 and Null Hypothesis 2 and their Subsidiary Null Hypotheses

- $H_{01}$ : There is no significant inclination towards lifelong learning on personal development after the IVSC
- $H_{01a}$ : There is no significant inclination towards lifelong learning on personal development (cognitive dimension) after the IVSC
- $H_{01b}$ : There is no significant inclination towards lifelong learning on personal development (critical thinking dimension) after the IVSC
- $H_{02}$ : There is no significant inclination towards lifelong learning on future readiness after the IVSC
- $H_{02a}$ : There is no significant inclination towards lifelong learning on future readiness (future employability preparedness dimension) after the IVSC
- $H_{02b}$ : There is no significant inclination towards lifelong learning on future readiness (preparedness in progression of studies dimension) after the IVSC
- $H_{02c}$ : There is no significant inclination towards lifelong learning on future readiness (preparedness in stock investment dimension) after the IVSC

One-sample t-tests were conducted for both the hypotheses and their subsidiaries and results showed that the null hypotheses and their associated subsidiary null hypotheses were all rejected in favor of the alternative hypotheses. Table 1 displays the results of the hypotheses testing.

Thus, there is a statistically significant inclination towards lifelong learning on personal development after the IVSC (M=7.61, SD=1.57);  $t(69)=13.88, p=0.000$ .

There is a statistically significant inclination toward lifelong learning on personal development (cognitive) after the IVSC (M=7.51, SD=1.70);  $t(69)=12.37, p=0.000$ .

There is a statistically significant inclination toward lifelong learning on personal development (critical thinking) after the IVSC (M=7.72, SD=1.59);  $t(69)=14.28, p=0.000$ .

**Table 1: One-sample t-tests for inclination towards lifelong learning with regards to personal development and future readiness after the IVSC**

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
H01	70	7.6188	1.57771	.18857		
H01a	70	7.5143	1.70012	.20320		
H01b	70	7.7232	1.59453	.19058		
H02	70	7.5423	1.60513	.19185		
H02a	70	7.4119	1.78397	.21323		
H02b	70	7.6279	1.58689	.18967		
H02c	70	7.5870	1.63612	.19555		

One-Sample Test						
Test Value = 5						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H01	13.887	69	.000	2.61875	2.2426	2.9949
H01a	12.373	69	.000	2.51429	2.1089	2.9197
H01b	14.289	69	.000	2.72321	2.3430	3.1034
H02	13.251	69	.000	2.54226	2.1595	2.9250
H02a	11.312	69	.000	2.41190	1.9865	2.8373
H02b	13.855	69	.000	2.62786	2.2495	3.0062
H02c	13.229	69	.000	2.58701	2.1969	2.9771

There is a statistically significant inclination towards lifelong learning on future readiness after the IVSC (M=7.54, SD=1.60);  $t(69)=13.25, p=0.000$ .

There is a statistically significant inclination towards lifelong learning on future readiness (preparedness in future employability) after the IVSC (M=7.41, SD=1.78);  $t(69)=11.31, p=0.000$ .

There is a statistically significant inclination towards lifelong learning on future readiness (preparedness in progression of studies) after the IVSC (M=7.62, SD=1.58);  $t(69)=11.85, p=0.000$ .

There is a statistically significant inclination towards lifelong learning on future readiness (preparedness in stock investment) after the IVSC (M=7.58, SD=1.63);  $t(69)=13.22, p=0.000$ .

These results show that IVSC effectively stimulated participants' inclination towards lifelong learning on personal development and future readiness. These results suggest that stock trading simulation activities do provide opportunities for participants to foster their cognitive and critical thinking skills. These skills are essential to prepare participants in their future employability, progression of studies and stock investment.

**Testing of Null Hypothesis 3**



H<sub>03</sub>: There is no significant difference in the perception of initial self-directed learning in stock trading before and after the Inter-Varsity Stock Challenge (IVSC)

A paired samples t-test was performed for the above hypothesis and the results are reflected in Table 2.

The test showed that the participants' level of perceived initial self-directed learning in stock trading increased from before (M=5.64, SD=1.43) to after (M=7.49, SD=1.63; t= - 8.81, p= 0.000, d= - 1.05) the Inter-Varsity Stock Challenge (IVSC).

Hence, the result suggests that the IVSC does have an impact to stimulate self-directed learning after undergoing the stock trading simulations activities. Participants take the initiative in learning, become proactive learners to learn more and learn better in stock trading. After undergoing the stock trading simulations participants are motivated by internal incentives, such as the desire to achieve personal development and future preparedness in employment, progression of studies and stock investment.

**Table 2: Paired Samples t-test for the perception of self-directed learning in stock trading before and after the IVSC**

Paired Samples Statistics									
		Mean	N	Std. Deviation	Std. Error Mean				
Pair 1	H03B4	5.6482	70	1.43571	.17160				
	H03AFT	7.4918	70	1.63211	.19507				

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	H03B4 & H03AFT	70	.355	.003

Paired Samples Test									
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	H03B4 - H03AFT	-1.84362	1.74946	.20910	-2.26077	-1.42648	-8.817	69	.000

#### Testing of Null Hypothesis 4

H<sub>04</sub>: There is no correlation between stock trading literacy after the Inter-Varsity Stock Challenge (IVSC) participation and lifelong learning in stock trading

Pearson product-moment correlation coefficient was computed to assess the relationship between stock trading literacy after the Inter-Varsity Stock Challenge (IVSC) and life-long learning in stock trading dimension. The statistical analysis shown on Table 3 revealed that the null hypothesis H<sub>04</sub> is rejected in favor of the alternative hypothesis.

**Table 3: Pearson's Product-Moment Correlation coefficients between stock trading literacy after the Inter-Varsity Stock Challenge (IVSC) and life-long learning in stock trading dimension**

Descriptive Statistics			
	Mean	Std. Deviation	N
StocktradingLiteracy	7.4616	1.61897	70
H03lifelonglearning	7.8571	1.59751	70

Paired Samples Test									
Pair 1	H03B4 - H03AFT	Mean	Std. Deviation	Paired Differences			t	df	Sig. (2-tailed)
				Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
		-1.84362	1.74946	.20910	-2.26077	-1.42648	-8.817	69	.000

Thus, there is a statistically significant, positively strong correlation between stock trading literacy after the Inter-Varsity Stock Challenge (IVSC) and life-long learning in stock trading dimension ( $r = 0.853$ ,  $n = 70$ ,  $p < 0.05$ , two-tailed).

This result suggests that when participants underwent the transaction activities throughout the competition period, their level of stock trading literacy is enhanced and further stimulated participants' interest to explore new knowledge and ideas in stock trading. Thus, IVSC promotes the spirit of life-long learning in stock trading amongst the participants.

## 6. Discussion and Conclusion

The statistical analysis revealed that there was statistically significant perception of effectiveness of stock trading simulation activities to inculcate lifelong learning amongst participants with regards to personal development, future readiness and self-directed learning. There was a strong positive correlation between stock trading literacy after the stock trading simulation activities and life-long learning in stock trading dimension. Stock trading simulation activities provide opportunities for participants to foster self-efficacy, promote the spirit of life-long learning in stock trading, and enhance employability skills for sustainability in the rapidly changing world. These results affirmed that educational simulation is an effective and efficient technique to develop soft skills and to acquire 21st century competencies for competitiveness and sustainability in a challenging workplace.

In this ever-changing global environment, lifelong learning and the ability to focus on continuously learning new and in-demand skills are the key to success in the future workplace for sustaining long-term employability. Lifelong learning is no longer an option but a necessity to develop competences and skills required in the rapidly changing environment. Experiential teaching-learning strategy particularly using educational simulations as a supplemental pedagogical tool significantly promote deeper learning, enrich learning experience, enhance learning outcomes, and improve academic performance in a dynamic learning cycle.

### Conclusion

Stock trading simulation activity is an effective platform to bridge the gap between theory and practice. Statistical analysis reveals that stock trading simulation activities effectively helped develop participants' soft skills and high order thinking skills that are highly valued in the competitive job landscape. Furthermore, the results also revealed that stock trading simulation serves as a powerful tool to inculcate lifelong learning amongst participants with regards to personal development, future readiness and self-directed learning.

The learning outcomes of these stock trading simulations are also in line with United Nations Sustainable Development Goals 4 which is to ensure accessible and fair quality education and to promote lifelong learning opportunities for everyone by 2030. Therefore, there is a necessity, and it is important to actively embed educational simulations in higher education curriculums to promote deeper learning, to acquire 21st century competencies and to inculcate lifelong learning among learners.

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