

**THE MEDIATING EFFECT OF STUDENT  
SATISFACTION ON SELF-DIRECTED  
LEARNING AND BENEFITS OF E-LEARNING  
UNDERGRADUATE NURSING EDUCATION  
PROGRAMMES IN MALAYSIA**

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**ASIA e UNIVERSITY**

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THE MEDIATING EFFECT OF STUDENT SATISFACTION  
ON SELF-DIRECTED LEARNING AND BENEFITS OF  
E-LEARNING UNDERGRADUATE NURSING  
EDUCATION PROGRAMMES IN MALAYSIA

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## ABSTRACT

E-learning has become an important and ubiquitous instructional tool across a broad range of programmes in institutions of higher education. This is evident today in nursing education whereby e-learning in a blended mode approach provides enormous opportunities for working nurses to further their studies and to enhance their professional development and life-long learning. The purpose of this study was to identify the e-learning success factors in e-learning nursing undergraduate programmes in Malaysia. Specifically, the study aims to investigate the: (1) relationship among self-directed learning (SDL) abilities, e-learning quality, student satisfaction and e-learning benefits; and (2) the mediation effect of student satisfaction on e-learning benefits through self-directed learning abilities and e-learning quality. The conceptual framework for this study is based on DeLone and McLean Information Systems Success Model. This is a cross-sectional quantitative correlational study using a predictive design and multivariate analysis method. Stratified random sampling technique was applied to recruit 241 nursing students through an online survey. The Self-directed Learning Instrument (SDLI) and an E-learning Course Evaluation Survey were used to measure the independent and dependent variables of the study. The variance-based Partial Least Squares Structural Modeling (PLS-SEM) method was employed to analyse the possible effects on the relationships among the variables studied. The findings revealed statistically significant relationships among the factors of SDL abilities, e-learning quality, student satisfaction, and e-learning benefits. Student satisfaction was found to be the strongest predictor ( $\beta=0.418$ ) for e-learning benefits followed by e-learning quality ( $\beta=0.261$ ) and SDL abilities ( $\beta=0.178$ ). In addition, the results showed that there is a mediating effect of student satisfaction on e-learning benefits through SDL abilities and e-learning quality. This study highlights the

crucial role of learning environment needs among online learners. A collaborative effort between universities, educators, and support personnel is essential to ensure successful continuous e-learning education for student nurses. It is recommended that future studies further explore other possible factors in the model that could help to enhance successful e-learning in nursing education.

Keywords: e-learning quality, e-learning benefits, mediating effect, nursing education, self-directed learning abilities, student satisfaction

## APPROVAL

I certify that I have supervised / read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in quality and scope, as a thesis for the fulfilment of the requirements for the degree of Doctor of Philosophy.



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## DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part for a degree at this or any other university. In making this declaration, I understand and acknowledge that any breaches in this declaration constitute academic misconduct which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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A handwritten signature in black ink, appearing to read 'Changwo', is centered within a light gray rectangular box.

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## TABLE OF CONTENTS

<b>ABSTRACT</b>	<b>ii</b>
<b>APPROVAL</b>	<b>iv</b>
<b>DECLARATION</b>	<b>v</b>
<b>ACKNOWLEDGEMENTS</b>	<b>vii</b>
<b>TABLE OF CONTENTS</b>	<b>viii</b>
<b>LIST OF TABLES</b>	<b>xi</b>
<b>LIST OF FIGURES</b>	<b>xiii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xiv</b>
<b>CHAPTER 1.0 INTRODUCTION</b>	<b>1</b>
1.1 Background of the Study	1
1.2 Statement of the Problem	7
1.3 Purpose of the Study	12
1.4 Research Objectives	13
1.5 Research Questions	14
1.6 Research Hypotheses	15
1.7 The Research Framework	17
1.7.1 DeLone and McLean Information System Success Model	18
1.7.2 Self-Directed Learning, Student satisfaction and E-Learning Benefits	19
1.7.3 Quality of E-Learning Success	20
1.8 Scope of the Study	25
1.9 Significance of the Study	26
1.10 Definitions of Terms	31
1.11 Limitations	38
1.12 Organisation of the Study	39
1.13 Summary	40
<b>CHAPTER 2.0 LITERATURE REVIEW</b>	<b>46</b>
2.1 Introduction	46
2.2 Theoretical Framework	47
2.2.1 Activity Theory	48
2.2.2 Constructivist Theory	52
2.2.3 Adult Learning Theory	58
2.2.4 Self-Directed Learning	62
2.2.5 DeLone and McLean Information System Success Model	69
2.3 E-Learning Quality	76
2.3.1. E-learning and Its Definitions	76
2.3.2 Development, Trend, Status and Issues of E-Learning Quality in Malaysia	77
2.3.3 The Impact of E-Learning	83
2.3.4 E-Learning in Nursing Education	89
2.3.5 E-Learning Quality, Student Satisfaction and E-Learning Benefits	96
2.3.6 System Quality	105
2.3.7 Information Quality	109
2.3.8 Service Quality	113
2.4 Self-Directed Learning	118

2.4.1 Self-Directed Learning and E-Learning	118
2.4.2 Self-Directed Learning in Nursing Education	124
2.4.3 Self-Directed Learning Abilities, Student Satisfaction and E-Learning Benefits	130
2.4.4 Instrument Used to Measure Self-Directed Learning	139
2.5 Summary	142
Table 2.1 Summary of literature review	144
a) Summary of literature review on self-directed learning	144
b) Summary of literature review on e-learning and student satisfaction	160
c) Summary of literature review on e-learning benefits/learning outcomes	195
d) Summary of literature review on e-learning quality	216
<b>CHAPTER 3.0 METHODOLOGY</b>	<b>229</b>
3.1 Design of the Study	229
3.2 Study Site	231
3.3 Population of the Study	233
3.4 Sampling Procedure	234
3.5 Instrumentation	238
3.5.1 E-Learning Systems Success Model Questionnaire	239
3.5.2 Self-Directed Learning Instrument (SDLI)	243
3.6 Validity and Reliability	245
3.7 Data Collection	247
3.8 Permissions, Ethics Clearance and Informed Consent	250
3.9 Data Analysis	251
3.10 Summary	261
<b>CHAPTER 4.0 RESULTS</b>	<b>262</b>
4.1 Introduction	262
4.2 Participants and Response Rates	262
4.3 Demographic Data of Participants	263
4.3.1 Age	264
4.3.2 Gender	265
4.3.3 Marital status	266
4.3.4 Years of Working Experience	267
4.3.5 Working Position	268
4.3.6 Current Clinical Area	269
4.3.7 Experience in Online Learning Programme	270
4.3.8 Academic Year	271
4.3.9 Current Cumulative Grade Point Average	272
4.4 Test of Normality	274
4.5 The Level of E-Learning Systems Success	275
4.6 The Level of Self-Directed Learning (SDL) Abilities	277
4.7 Results of the Measurement Models	277
4.8 Results of the Structural Model	283
4.8.1 Research Question One	289
4.8.2 Research Question Two	290
4.8.3 Research Question Three	291
4.8.4 Research Question Four	292

4.8.5	Research Question Five	292
4.8.6	Research Question Six	293
4.8.7	Research Question Seven	295
4.9	Summary	297

## **CHAPTER 5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS** **302**

5.1	Introduction	302
5.2	Summary of the Study	302
5.3	Discussion of the Findings	305
5.3.1	Research Question One	305
5.3.2	Research Question Two	308
5.3.3	Research Question Three	317
5.3.4	Research Question Four	322
5.3.5	Research Question Five	333
5.3.6	Research Question Six	335
5.3.7	Research Question Seven	339
5.4	Implications of the Study	342
5.5	Conclusion	349
5.6	Recommendations for Future Research	350

## **REFERENCES** **354**

## **APPENDICES** **401**

Appendix A:	Approval of study	401
Appendix B:	Permission for data collection from University A	402
Appendix C:	Permission for data collection from University B	403
Appendix D:	Email invitation for survey	404
Appendix E:	Study information sheet	405
Appendix F:	Consent form	406
Appendix G:	Letter for content validity	407
Appendix H:	Curriculum vitae of content experts	411
Appendix I:	The I-CVI ratings on e-learning course evaluation survey	412
Appendix J:	The I-CVI ratings on SDLI scale	413
Appendix K:	Letter of permission to conduct pilot study	414
Appendix L:	Permission for instruments	415
a)	Permission for D&M IS Model	415
b)	Permission for E-Learning Course Evaluation Survey tool	416
c)	Permission for Self-Directed Learning Instrument (SDLI)	417
Appendix M:	Questionnaire	418
Section A:	Demographic Information	418
Section B:	E-Learning Course Evaluation Survey	419
Section C:	Self-Directed Learning Instrument (SDLI)	421
Appendix N:	SPSS data	422
Appendix O:	PLS data	423
Appendix P:	Summary of research framework	425

## LIST OF TABLES

<b>Table</b>	<b>Page</b>
1.1 Conceptual and operational definitions of the study	42
2.1 Summary of literature review	144
3.1 Proportion of sample population for study	235
3.2 Sampling criteria of the study	238
3.3 Reliability results of the e-learning course evaluation survey tool	247
3.4 Reliability results of SDLI scale	247
3.5 Summary of analytical framework	258
4.1 Demographic data (n=241)	263
4.2 Test of normality for research variables (n=241)	274
4.3 Descriptive data of e-learning systems success (n=241)	276
4.4 Level of e-learning systems success (n=241)	276
4.5 Descriptive data of self-directed learning (SDL) abilities (n=241)	277
4.6 Indicator loadings of variables	280
4.7 Construct validity and reliability of the measurement model of the study	282
4.8 Discriminant validity (HTMT) criterion	283
4.9 Lateral collinearity assessment of inner VIF	284
4.10 Hypotheses testing using bootstrapping	285
4.11 Latent variable values	286
4.12 PLS predictive power assessment	287
4.13 Hypotheses testing using bootstrapping (partially extracted from Table 4.10)	294
4.14 Total effect for variables student satisfaction, self-directed learning abilities, and e-learning benefits	295
4.15 Hypotheses testing using bootstrapping (partially extracted from Table 4.10)	296

4.16 Total effect for variables student satisfaction, e-learning quality, and e-learning benefits	297
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## LIST OF FIGURES

<b>Figure</b>	<b>Page</b>
1.1 Conceptual framework of the study	23
1.2 Mediation model of the study	24
2.1 Activity theory	51
2.2 Evolution of SDL theory	67
2.3 DeLone and McLean Information System Success Model	71
2.4 The stages of e-learning systems	74
3.1 Flow chart of the sampling method of the study	237
3.2 The e-learning success model and sample metrics	241
4.1 Percentage distribution of nurses by age category	265
4.2 Distribution by gender among nurses	266
4.3 Distribution by marital status among nurses	267
4.4 Distribution of nurses by number of years of working experience	268
4.5 Distribution of nurses by years of working experience and working position	269
4.6 Distribution of nurses by current clinical area	270
4.7 Distribution by online learning experience among nurses	271
4.8 Distribution by academic year among nurses	272
4.9 Distribution by CGPA category among nurses	273
4.10 Distribution by CGPA scores among nurses	273
4.11 Higher-order model of the study	279
4.12 Final model of the study in PLS-SEM path analysis	288
4.13 Final model of the study in PLS-SEM context	301

## LIST OF ABBREVIATIONS

AGFI	Adjusted Goodness of Fit Index
AKEPT	Higher Education Leadership Academy
APA	American Psychological Association
AVE	Average Variance Extracted
CFI	Comparative Fit Index
CR	Composite Reliability
GFI	Goodness of Fit Index
HEIs	Higher Education Institutions
HTMT	Heterotrait-Monotrait
ICT	Information and Communication Technology
IT	Information Technology
M	Mean
MOH	Ministry of Health
MOHE	Ministry of Higher Education
MQA	Malaysian Qualifications Agency
NBM	Nursing Board Malaysia
NFI	Normed Fit Index
ODL	Online Distance Learning
PLS-SEM	Partial Least Squares Structural Equation Modeling
RMSEA	Root Mean Squared Error of Approximation
RMSR	Root Mean Square Residual
SD	Standard Deviation
SDL	Self-directed Learning
WHO	World Health Organisation

## **CHAPTER 1.0 INTRODUCTION**

In the past few decades, society has transformed into a radical way in that the 21<sup>st</sup> century is framed by technology that brings new demands on education. Technology is perceived as an innovative means in improving educational outcomes when it is used to enable learning opportunities (Fishman & Dede, 2016). Consequently, the focus for teaching and learning is on how educators can utilise technology effectively in meeting the challenges and needs of all learners. The nursing profession requires nurses to be equipped with the relevant knowledge, skills, and attitude to integrate nursing practice in healthcare (Sowtali, 2019). Integration of technology in a flexible learning method has increasingly drawn many working adults to enrol in higher education. In the field of nursing, enrolment in bachelor's degree programmes employing e-learning or blended mode is encouraging (Harerimana et al., 2016; Rouleau, 2018). Such technological advances have not only helped to enhance professional development of nurses but have also enabled them to fulfil their requirement for lifelong learning. In light of this technological transformation in higher education, it is thus important to examine how factors of e-learning quality and self-directed learning abilities could influence student satisfaction, and in turn, how these factors could provide e-learning benefits for working adults in e-learning nursing undergraduate programmes.

### **1.1 Background of the Study**

It is a challenge for nurses to meet the increasingly complex needs of patients in the 21<sup>st</sup> century. The challenges include the increased prevalence in diseases, the growing complexity of technology in the healthcare system, and a shortage of nursing workforce. Moreover, knowledge, skills, technology, and medicine in healthcare have



grown exponentially than the ability of nurses to provide their services effectively to their patients. These factors aggravate the negative impact for nurses to provide safe and quality patient care. To keep up with advances in nursing science and healthcare skills, nurses need to be equipped with new knowledge and skills for evidence-based practice, be capable in applying problem-solving and critical thinking skills, and be independent for lifelong learning. This is in line with the Strategic Plan 2020 developed by the Ministry of Higher Education Malaysia (MOHE, 2010) which aims to upgrade nurses' professionalism through higher education and training. Better knowledge and skills are vital in enabling nurses to provide higher level of quality care for patients, and thus meeting the needs of the healthcare systems in a professional manner. The professional values of nurses that guide them in delivering ethical practice and safe care can also be continuously enhanced through nursing education programmes (Poorchangizi, Borhani, Abbaszadeh, Mirzaee & Farokhzadian, 2019).

In the current Development Plan of Nursing Education, the Ministry plans to achieve a degree-diploma nurse ratio for at least 60:40 by 2020 (MOHE, 2010). Nurses with Bachelor of Nursing are recognised as professional nurses who are competent in knowledge-based practice, clinical care, ethical practice, critical thinking and problem-solving skills (Ministry of Higher Education Malaysia, 2010). The World Health Organisation (2016) or WHO advocates that continuous education and training to healthcare providers as key elements to improve safe and quality care. According to Audet, Bourgault and Rochefort (2018), higher level of education in nurses is negatively correlated to lower mortality rate by 61.1%. Past studies also found that nurses with a higher degree of qualification were able to reduce medication errors (Sowtali, 2019) and mortality rates for patients who have undergone surgery (Haegdorens, Van Bogaert, De Meester & Monsieurs, 2019). This new development

shows that a better educated nurse possesses critical thinking and problem-solving skills and will be able to provide higher quality nursing care. Problem-solving is considered as one of the core competencies for nurses (Luo, X-H. Zhang, C-M. Zhang & Liu, 2019). Institutions of higher learning which offer Bachelor of Nursing programmes are urged to implement courses that could enhance professional development and lifelong learning (Ministry of Education Malaysia, 2015) and to further prepare nurses in delivering quality healthcare to patients. The MOHE's plan has motivated many diploma nurses to upgrade their education to degree level. This has inspired many nursing professionals to further their education to an advanced level. Various studies support the ability of e-learning programmes in enhancing nurses' knowledge, skill, and caring behavior towards quality patient care (Arkorful & Abaidoo, 2015; Nilasari & Sri Hariyati, 2018; Peterson, Clark, Sprod, Verrall & English, 2017; Rouleau et al., 2019). Accordingly, caring behavior comprises professional values and standards that guide nursing practice (Lee, Kim & Chae, 2020). Pursuing higher education through e-learning nursing programmes is therefore important for nurses to promote their professional development and core values of caring. As a result, there has been a dramatic increase in online or blended mode programmes offered to working nurses by institutions of higher learning in recent years.

This study was conducted at two local universities which offer the Bachelor of Nursing Science post-registration programmes in an e-learning delivery approach. The study site, University A, is an innovation-driven institution owned by a consortium established in the year 2000 and which further developed into the first private university adopting online distance learning (ODL) in Malaysia. In 2008, the university offered the Nursing Science Undergraduate Programme which supports an e-learning platform. Today, the university continues to undergo enhancements through ODL to achieve its

vision and mission of being a leading provider of flexible and lifelong learning opportunities to learners.

University B, on the other hand, is recognised as the first well established Medical and Health Sciences private university in Malaysia. Presently, the university offers 13 undergraduate programmes and eight post graduate programmes. Since 2009, the Nursing Science undergraduate programme of the institution has encouraged the working nurses to add value to their degree using e-learning and classroom teaching methods. This is in line with the university's mission to strengthen interpersonal communication, problem-solving, and self-directed learning skills of the learners. Both the universities chosen are conform with Malaysia Education Blueprint 2015-2025 regulations and the National Transformation 2050 (Ithnin et al., 2018). Based on the 3<sup>rd</sup> Shift: Nation for Life-long Learning, the blueprint focuses on the outcomes of learners and life-long learning for professional and personal development (Ministry of Education Malaysia, 2015).

In nursing education, traditional classroom teaching and teacher-centred approach remain the norm in many institutions across countries (Arunasalam, 2017). Despite rapid advancement in information and communication technology (ICT), the Nursing Board licensure examination continues to be based on paper-and-pencil examinations while other health disciplines have adopted the use of online technology. In Malaysia, all colleges and universities which offer Nursing Diploma and Bachelor programmes are required to adhere to the standard criteria set by Malaysian Qualifications Agency (MQA), Ministry of Higher Education (MOHE) and Nursing Board Malaysia (NBM). However, future progress in nursing education for a one-tier 4-year full time nursing undergraduate programme remains uncertain because it is a

new programme endorsed in August 2018 by the Nursing Board Malaysia (NBM), Ministry of Health (MOH) and Ministry of Higher Education (MOHE). Diploma nurses who need to obtain a bachelor's degree are required to enrol in the 4-year programme with a maximum of 30% credit exemption from their diploma certification. Based on the new standards of the programme, a 3-year study duration in an online approach or a 4-year conventional approach are the choices for diploma nurses to upgrade to a bachelor's degree (Nursing Board Malaysia, 2018). Apparently, most of the working nurses may prefer a 3-year online distance programme which enables them to be more independent learners.

There has been a steady increase in the prevalence of online programmes offered in higher institutions nationwide. It was estimated that in 2019, there were more than two billion social media users across the world (Pendey, 2018). In Malaysia, the number of private higher education institutions offering distance learning or e-learning programmes has increased greatly within the last 10 years, from 13 to 46, which makes up 72% from the year 2006 to 2016 (Department of Statistics Malaysia, 2018a). Internet access by Malaysian individuals aged 15 years and above increased from 71.1% in 2015 to 80.1% in 2017 (Department of Statistics Malaysia, 2018b). In 2019, the Internet access among the Malaysian population has accelerated to 90.1% (Department of Statistics Malaysia, 2020). Of these, 98.2% users were using mobile phones and 71.3% were using computers for online access. These statistics indicate a tremendous increase in utilisation and access of the Internet by the younger population in Malaysia. Similarly, the demand for online education in nursing education is on the rise with the increase in more young graduates entering the nursing profession.

Self-directed learning (SDL) is an influential pedagogical strategy in higher education. Various studies on the topic of SDL in teaching and learning have been conducted in nursing education in the past two decades. However, most studies showed that SDL interventions have not been actively implemented in nursing programmes (Alspach, 1991; Avdal, 2013; Cadorin et al., 2012; Daniels, 2011; Hegge, 1985; Prociuk, 1990). In contrast, Clark (1986), and Hamilton and Gregor (1986) stated that education pertaining to SDL research in nursing had been mostly conducted in clinical settings. The ability to be self-directed is imperative for adult learners to continue education in nursing. Moreover, online learners need to be self-reliant in online learning. Past literature reveals that learners who scored high in SDL performed better in academic achievement (Boyer, Edmondson, Artis, & Fleming, 2014). Similarly, SDL abilities in other health related programmes such as pharmacy (Benedict, Schonder, & MsGee, 2013), medicine (Kek, 2011), and dentistry (Deyo, Huynh, Rochester, Sturpe, & Kiser, 2011) have shown positive correlations with academic outcomes.

Ultimately, SDL in nursing bachelor education may serve as a tool to assist faculty to understand how nursing candidates in e-learning undergraduate programmes demonstrate confidence in completing e-learning courses while decreasing the attrition rate from the programme. This study aims to investigate the effect of SDL abilities and e-learning quality may have on e-learning benefits through student satisfaction. The study will allow the researcher to understand (1) if nursing undergraduates experience higher satisfaction and are confident in following an e-learning nursing programme, (2) the ability of student nurses for self-direction in e-learning environment that may lead them to accomplish their learning goals, and (3) the quality of the e-learning information systems provided to students in terms of service quality, information quality and system quality.

## 1.2 Statement of the Problem

In view of the transformation of e-learning in higher education, there is limited evidence on how factors of e-learning quality affect student satisfaction and learning benefits among undergraduates in nursing programmes. In Malaysia, various studies on e-learning approaches have been conducted in the health sciences field such as medical science, biomedical science, nutrition and dietetic, and optometry (Azhari & Long, 2015). However, few studies have been conducted on the nursing discipline and on didactic nursing programmes (Lee et al., 2020). Thus, there is a need to examine the strengths and limitations of e-learning approaches in the context of local nursing education. The instructional needs of working nurses within e-learning programmes have not been extensively explored in terms of self-directed learning (SDL) abilities. Gagnon, Gagnon, Desmartis and Njoya (2013) highlighted the dearth of studies focusing on SDL impact on learning outcomes. Although self-directed learning that best suits a course varies in each programme, the effectiveness of a specific instructional design in meeting learners' needs for online education is crucial for the success of the programme. To date, the level of SDL abilities among working nurses in e-learning nursing education in Malaysia remains uncertain. Nursing educators play a major role in facilitating students to boost their ability for self-direction particularly in online learning environment.

In their meta-analysis of online learning in nursing education, Voutilainen, Saaranen, and Sormunen (2017) assert that no generalisation with regards to e-learning can be made of nursing education. Thus far, the direction of the effect of e-learning on learning outcome seems broad and varied. Voutilainen et al. (2017) suggest that further studies should investigate the predicting factors that may cause variation in learning

outcomes among nursing students in online education. Understanding the e-learning quality factors in terms of service, information and system support might influence e-learning outcomes that benefit the students. Another meta-analysis reported a lack of studies on effects of e-learning in comparison to didactic learning (i.e., classroom teaching) in nursing education (Lahti, Hätönen & Välimäki, 2014). Button, Harrington and Belan (2014) concur on the critical need to evaluate the impact, effectiveness, and user perception of e-learning approach in nursing education.

In Malaysia, Embi (2011) reported that only 23.1% of higher education institutions (HEIs) in public sectors conducted periodical studies in measuring e-learning effects and impact on students' achievement. The researcher recommended for further research on enhancing e-learning integration in education and to explore its effectiveness and impact on learning outcomes. It is the responsibility of healthcare professionals such as nurses to keep themselves updated in developing new knowledge and skills for safe care (Van Rensburg & Botma, 2015). Otherwise, it will cause negative implications on the quality of nursing practice. In view of the increased number of higher education institutions implementing the online or blended learning programmes, further research on e-learning application and its influence on nursing undergraduate education is greatly needed.

The demand for qualified nursing workforce has increased worldwide. Similarly, in Malaysia, a major concern is on the shortage of nurses with degree qualifications. The Ministry of Health, Malaysia (2016) has developed a strategy to increase the nurse-to-client ratio from 1:360 in 2015 to 1:218 in 2019. Similarly, the Ministry of Higher Education, Malaysia (2010) highlighted the need to achieve a degree-diploma nurse ratio to at least 60:40 by 2020. However, there was only 10.3% of bachelor's degree holders in private hospitals in Malaysia in the past few years

(Abdul Rahman, Jarrar & Don, 2015). On the same note, Arunasalam (2017) indicated that only 2% of the nursing workforce in Malaysia had obtained a degree. The data are worrying as the percentage of bachelor's degree holders is much lower than the targeted number set by the Ministry of Higher Education, Malaysia. Indeed, many nursing universities are moving towards e-learning or blended learning to meet the demand to train more bachelor's degree nurses, and they begin to tailor the nursing bachelor programmes according to the needs of working nurses. However, didactic classroom teaching is the dominant approach in nursing education in which teacher-centred methods are still practiced in many nursing institutions (Van Rensburg & Botma, 2015; Shin, Choi, Margaret & Lee, 2017), and in Malaysian institutions (Nasri, 2017). Nevertheless, neither didactic learning nor online learning is superior to the other. It raises the question on whether working adults who were taught in a didactic teaching paradigm are ready to be independent and self-directed when learning online. Thus, this study was conducted to examine the SDL abilities among nursing undergraduates in the e-learning programmes and the direct and indirect effects of students' satisfaction on e-learning benefits.

The MOHE (2017) reported that out of a total of 354,673 students enrolled in both the online and conventional programmes, only 119,873 (33%) of the students had successfully graduated within the programme's duration. The challenge to retain students in online learning is much greater for higher education institutions in comparison to conventional learning. Similarly, the delayed graduation and attrition rate for online undergraduate programmes remain high in undergraduate programmes in many countries (Bawa, 2016; Fraser, Fahlman, Arscott & Guillot, 2018). For example, the literature on nursing education around the world reveals that the attrition rate of nursing students is high, as much as 50% in some nursing bachelor programmes