IMPACT OF GENDER ON SELF-DIRECTED LEARNING AMONG ELEARNING NURSING UNDERGRADUATE IN MALAYSIA

Woan Ching Chang, International Medical University

ABSTRACT

The demand for online education is rising for working nurses because of its flexibility and accessibility, which allows them to further their studies and enhance their professional development. Self-directed learning is imperative for nurses to continue their education using the elearning approach. This study investigates gender differences in overall self-directed learning among working nurses in elearning nursing programs in Malaysia. The conceptual framework for the study is based on the concepts of the self-directed learning model. This is a cross-sectional quantitative correlational study using a multivariate analysis method. Stratified random sampling technique was employed to query 241 nursing students through an online survey. The Self-directed Learning Instrument (SDLI) was adopted to measure the dependent variables of the study. The findings of the study revealed statistically significant differences between gender and the dependent variables ($p < 0.05$) of learning motivation, planning and implementation, interpersonal communication, and self-monitoring. Male nurses reported higher levels of self-directed learning than females. This study highlights the important concepts of self-directed learning among online learners. The role of educators is essential to support students for self-direction in elearning education. Future studies to explore other possible determinants in elearning context are recommended.

Keywords: *self-directed learning, elearning, gender, nurses*

INTRODUCTION

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, capable in applying problem-solving and critical thinking skills, and independent for life-long 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 for enabling nurses to provide a higher level of quality care for patients, and thus meet the needs of the healthcare systems in a professional manner. Although self-directed learning (SDL) is a promising and effective pedagogy in nursing education (Lee et. al., 2020), the instructional needs of working nurses within elearning programs have not been extensively explored. The effectiveness of a specific instructional design in meeting learners' needs for online education is crucial for the success of the program. To date, the level of SDL among working nurses in elearning nursing education in Malaysia remains uncertain. Nursing educators play a major role in facilitating students to boost their ability for self-direction, particularly in an online learning environment.

The core principles of SDL are described as being self-driven, formulated, implemented, and evaluated with or without the support from others

(Knowles, 1975). 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 programs. 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. Several recent empirical studies (Bonk et al., 2018; Eka et al., 2019; Torun, 2020) highlighted the importance of examining SDL in online education. The concerns of online education include a lack of learner support, challenges in providing faculty support to a large number of elearners, faculty competency for SDL, and students' ability to self-direct their learning. Therefore, an initiative to promote SDL is needed. This initiative will enable undergraduate students and faculty to understand the need for self-direction, and will promote their acceptance of SDL.

LITERATURE REVIEW

A review of past studies found that there are various factors that contributed to attrition in and failure to complete online programs. These include social and family factors, motivational factors (such as self-direction), technological constraints, and limitations in technology training for faculty (Chang et al., 2022; Okwuduba et al., 2021). Online courses are heavily dependent on self-directed learning and students' motivation to learn. These can be the key factors to high attrition if students are not able to handle their study in the online learning environment. Similar trends are observed in local institutions in Malaysia where the rate of student attrition, termination, module/semester deferment, and cases appealed for extension of study are persistently high in elearning nursing undergraduate programs.

Meng et al.'s (2019) research findings in relation to the low level of SDL among student nurses are consistent with the findings of the study conducted by Alharbi (2018) and Rascón-Hernán et al. (2019). Although the SDL level (145.08 ±14.13) reported in the European nursing undergraduates was relatively low, nursing undergraduates obtained the highest SDL score among all other health sciences students in the Western countries (Koirala & Kafle, 2021; Rascón-Hernán et al., 2019). On the other hand, Eka et al. (2019) revealed a moderate level of SDL (M = 90.18, SD = 6.65), and a low to moderate level of motivation ranged from 2.99 to 3.35 for mean score with a standard deviation between 0.36 and 0.5 among undergraduate nursing students in Indonesia. From the study, the highest score for self-management (M = 31.51, SD = 2.85) and the lowest score for desire for learning (M = 28.54, SD = 2.67) were reported. The findings indicated that nursing students were capable of identifying, planning, and implementing their learning but lacked the intrinsic motivation to learn.

In Malaysia, Thiagraj et al. (2021) found that postgraduate students in a local university were not sure of their ability to self-direct in online mobile learning. This raises a question about the readiness and capability of educators in online education to facilitate students for self-direction. Instead, Nasri (2019) reported that a majority of the Malaysian faculty in the universities still preferred teacher-directed learning, and not all of them accepted the role as facilitators in SDL. Based on the study, faculty was reluctant to move away from their authority as teachers as in the traditional classroom teaching. The researchers urge educators to provide a student-centred learning approach in motivating students' desire to learn independently in higher educational institutions.

Using the Mann-Whitney test, Örs (2018) reported a significant difference of SDL readiness based on gender (p = 0.03) and working department (p = 0.018). Similarly, Lee et al. (2020) reported a significant difference of gender ($\beta = -0.22$, $p < 0.001$) in SDL among Korean nursing undergraduates. Male nursing students were found to have higher level of SDL as compared to female students. Other demographic variables such as academic year, course grades, religion, and parents' education level were found to have no statistically significant correlation to SDL. However, Grande et al. (2022) reported that female learners have a greater motivation to learn than males. Accordingly, intrinsic motivation among female students gradually increases with their academic year while male students experience the opposite. The researchers explained that female students tend to put more emphasis on achieving their learning outcomes, and they are more likely to interact with facilitators/faculty and peers during the learning process.

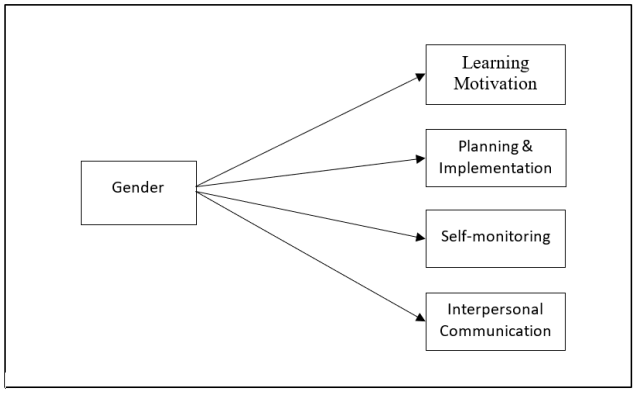
Ultimately, SDL in nursing bachelor education may serve as a tool to assist faculty understand how nursing candidates in elearning undergraduate programs demonstrate confidence in completing elearning courses while decreasing the attrition rate from the programs. This study will allow researchers to understand (1) the ability of nursing undergraduates for self-direction in elearning environment that may lead them to accomplish their learning goals, and (2) if males and females differ in terms of overall SDL.

METHOD AND INSTRUMENT

I employed a cross-sectional quantitative correlational survey using a multivariate analysis variance method to compare gender groups on four dependent variables (learning motivation, planning and implementation, interpersonal communication, self-monitoring). The population of the study (N = 1100) comprised adult working nurses enrolled in the elearning nursing education programs at twelve learning centers of two private universities in Malaysia. A stratified random sample of 241 nursing students based on geographic region of the institutions participated in the study using a self-administered questionnaire via an online survey. In this study, a medium effect size of 0.3 was anticipated in view of the inconsistent effect size for different variables measured in prior studies. Based on the G-Power software calculator version 3.1.9.2, the sample size required is 132, with effect size, f^2 at 0.1, alpha error probability of 0.05 and power of 0.95 for a 2-tails test. A sample size of 241 in this study therefore met the minimal sample size required to ensure correlations and regression analyses can be conducted (Samarasooriya et al., 2019).

This study used the concept of SDL as a framework to guide it in the elearning nursing context. The conceptual framework of the study is depicted in Figure 1. On the right of the model, the four variables of learning motivation, planning and implementation, interpersonal communication, and self-monitoring are the dependent variables of the study. While the variable of gender, on the left side of the model, is the independent variable that may impact the dependent variables. According to Cheng et al. (2010), learning motivation is operationally defined as the inner drive of a learner to take responsibility for their own learning with or without external motivation. Planning and implementing, on the other hand, is defined as the ability of a learner to set learning objectives and use appropriate learning resources and strategies to achieve elearning outcomes. Self-monitoring is defined as the ability of a learner to evaluate their own learning process and outcomes. Finally, interpersonal communication is defined as the ability of a learner to interact with others to promote effective learning.

Figure 1. Conceptual Framework of the Study



I posited the following are the research questions for the study:

1. What is the level of overall self-directed learning among nurses in elearning nursing education?
2. Do males and females defer in terms of overall self-directed learning among nurses in elearning education?
3. Are female nurses more self-directed in learning than males in terms of learning motivation, planning and implementation, interpersonal communication, and self-monitoring in elearning education?

I adapted the Self-Directed Learning Instrument (SDLI) from Cheng et al. (2010) to measure the level of SDL among nurses enrolled in the elearning programs. The SDLI tool was selected based on its high validity and reliability results from the test conducted on Asian nurses and student nurses. The SDLI contains 20 items across four dimensions, namely learning motivation (6 items), planning and implementing (6 items), self-monitoring (4 items), and interpersonal communication (4 items). The instrument comprises a 5-point Likert scale from

1 = *Strongly Disagree* to 5 = *Strongly Agree* ranging from 20 to 100 points. The higher the scores of each dimension indicate the higher level of SDL reported by students.

A sample of 30 subjects from a local private university were randomly selected for the pilot study. The SDLI was validated by six content experts who were involved in elearning teaching at higher education institutions. The results of the Item-level Content Validity Index (I-CVI) scores ranged from 0.83 to 1.00 for each item, validating the relevancy of the tool for the study. The internal consistency index obtained for SDLI was at Cronbach's Alpha of 0.954, indicating a strong internal consistency coefficient of the instruments for the study.

ETHICAL APPROVAL

This study was approved by the Asia e University Malaysia Internal Review Board. Permission for data collection was granted by the Centre for Research and Innovation of Open University Malaysia and International Medical University. Informed consent was obtained from participants prior to receiving the online survey.

RESULTS AND DISCUSSION

Self-directed Learning among Nursing Students

As shown in Table 1, the demographic data consisted of age, gender, marital status, working experience, working position, and prior experience in an online learning program. The mean age of participants was 32 years (SD = 6.269) and ranged between 25 and 57 years. A majority were female (93.4%, n = 225) and only 6.6% (n = 16) were male. The data showed that the gender of the participants was predominantly female. Similar results were reported by Yeoh and Wee (2017) in their study in which Malaysian nurses were approximately 95% female and 5% male. The findings of my current study support the past literature showing that female nurses remain the major workforce in Malaysia.

In terms of marital status, a total of 59.8% (n = 144) of the participants were single, 39.4% (n = 95) were married, and 0.8% (n = 2) were divorced

Table 1. Demographic Data of Participants (n = 241)

	Mean (M)	Standard deviation (SD)	Frequency (f)	Percentage (%)
Age (25–57 years)	31.8	6.269		
25–30 years			131	54.3
31–40 years			84	34.9
≥ 41 years			26	10.8
Gender				
Female			225	93.4
Male			16	6.6
Marital status				
Single			144	59.8
Married			95	39.4
Divorce/separated			2	.8
Years of working experience	9.5	5.684		
≤ 5 years			60	24.9
6–9 years			84	34.9
≥ 10 years			97	40.2
Working position				
Staff nurse/Charge nurse			200	83.0
Nurse educator/ Clinical instructor			13	5.4
Nurse manager/Sister			28	11.6
Online learning experience				
Yes			165	68.5
No			76	31.5

or separated. Many of the participants (40.2%, n = 97) reported having 10 years or more working experience. The years of working experience ranged between 3 and 32 years. On average, working experience among nurses was 9.5 years (SD = 5.684). A total of 83% (n = 200) of the participants held the position of staff nurse/charge nurse, 11.6% (n = 28) were nurse educator/clinical instructors, and 5.4% (n = 13) were nurse manager/sisters. Out of the 241 participants, 165 nurses (68.5%) reported that they had attended other online learning programs prior to their enrolment in the Bachelor of Nursing Science postregistration undergraduate programs. Another 76 participants (31.5%) reported that they did not have online learning experience. These results demonstrate that more than half of the nurses have participated in some form of training course using online learning.

The descriptive data of the perceived level of SDL among nursing students in the study is illustrated in Table 2. The mean, median, and standard deviation of the average ratings for overall SDL were 4.014, 4.000, and 12.424, respectively. More specifically, mean average and standard deviation for the four dimensions were Learning Motivation (M = 4.082, SD = 3.927), Planning and Implementation (M = 3.966, SD = 4.662), Self-monitoring (M = 4.028, SD = 2.641), and Interpersonal Communication (M = 3.967, SD = 2.569). The dimension of Learning Motivation was the highest perceived level in SDL followed by Self-monitoring, Interpersonal Communication, and Planning and Implementation. Overall, the level of SDL perceived by nurses was relatively high, with a total score of 80.282 over 100, mean score of 4.014, and standard deviation of 12.424.

Table 2. Descriptive Data of Self-Directed Learning among Nursing Students (n = 241)

Variables	Mean (M)	Standard Deviation (SD)	Total Score
Learning Motivation	4.082	3.927	24.497
Planning & Implementation	3.966	4.662	23.800
Self-monitoring	4.028	2.641	16.112
Interpersonal Communication	3.967	2.569	15.871
Overall self-directed learning	4.014	12.424	80.282

The ability of self-direction in elearning education is viewed as an important tool for students to function as independent learners. These skills may enable students to set priorities, identify effective ways to learn, and eventually impact their success in learning. The high level of SDL among nursing students in other countries (Koirala & Kafle, 2021; Örs, 2018) was found to be similar to this study. Students who have high levels of self-direction can set priorities to achieve targeted learning goals and explore information resources more effectively. The findings were also consistent with other studies by Ramli et al. (2018) and Grande et al. (2022), who revealed that SDL readiness and academic achievement were significantly influenced by self-efficacy and the motivation of learners.

However, the findings contradict a local study conducted by Adams et al. (2018). According to the researchers, most of the students from the social sciences self-reported that they were not comfortable with elearning and preferred to have a lecture-based learning method. A possible explanation might be the lack of an appropriate strategy applied in a student-centered approach in the programs, which caused a high level of anxiety among students who are not prepared for SDL.

The high mean scores obtained for Learning Motivation and Self-monitoring in this study showed they were the main factors that drive nursing students to achieve their learning goals, while Planning and Implementation and Interpersonal Communication are at moderate levels among the students. Although the majority of the students self-reported a moderately high SDL level when they know what needs to be done, the facilitation role of a teacher to guide students to be an independent learner is also crucial. Facilitators play a vital role in contributing to a positive SDL experience for students (Wong et al., 2021). Facilitators should motivate students to be more independent for self-direction as some of them may face challenges balancing work, family, and study commitments.

It is not uncommon for nursing students to struggle to have a systematic strategy of studying, which leads to ineffective SDL (Qamata-Mtshali & Bruce, 2018). This could be explained why working students perceived a slightly lower mean score in planning and implementation and interpersonal interaction with others as they may have limited time to spend on their studies. Time management

Table 3. Multivariate Tests between Gender and Self-Directed Learning (n = 241)

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Gender	Pillai's Trace	.060	3.772b	4.000	236.000	.005*	.060
	Wilks' Lambda	.940	3.772b	4.000	236.000	.005*	.060
	Hotelling's Trace	.064	3.772b	4.000	236.000	.005*	.060
	Roy's Largest Root	.064	3.772b	4.000	236.000	.005	.060

*P < .05

could be a concern for undergraduate working nurses; therefore, time management skills should be a targeted focus to all students starting from enrolment and throughout the program. Facilitators should help promote the importance of effective time management while guiding the students to the appropriate strategy to apply the skill. Nurcan and Saide (2018) revealed that the level of SDL and academic achievement were greater in students who managed their time better. Similarly, Wong et al. (2021) supported that time management is an important attribute for SDL in online learners. With the SDL approach, the process of facilitation would change students' attitudes from passive to active and to self-discipline, and they would be able to formulate their own learning strategies in planning, implementing, and evaluating their own learning in a timely manner.

Gender Differences in SDL among Nursing Students

I performed a one-way between group multivariate analysis of variance to identify gender differences in SDL using the four dependent variables of Learning Motivation, Planning and Implementation, Interpersonal Communication, and Self-monitoring. The independent variable was gender. Preliminary assumption testing was conducted to check for multivariate normality, linearity, outliers, multicollinearity and singularity, and homogeneity of variance-covariance matrices. The results showed no serious violations for MANOVA analysis. Moreover, Pallant (2020) supported the idea that the minimum sample size in each cell should be at least the number of dependent variables measured. In this study, 16 cases for males are considered as meeting the minimal sample size required. Indeed, the small sample size of males reflects the similar proportion of the male nurse population in Malaysia. The findings of this study revealed a statistically significant difference between females and males on the combined dependent variables, F (4, 236) = 3.77, p = .005; Wilk's Lambda = .94; partial eta squared = .06 (refer to Table 3). Based on this, 60% of variance in SDL is explained by gender, and female and male nurses differ in terms of their overall SDL in elearning programs.

Table 4 illustrates the between-subject effect of gender to each of the dependent variables. Results show that all four dependent variables for each reaches statistical significance difference by gender with a probability p value of less than .0125 using a Bonferroni adjusted alpha level by dividing .05 by 4 dependent variables. The significant differences were Learning Motivation, F (1, 239) = 7.505, p = .007, partial eta squared = .03, adjusted R^2 = .026; Planning and Implementation, F (1, 239) = 8.313, p = .004, partial eta squared = .03, adjusted R^2 = .030; Interpersonal Communication, F (1, 239) = 14.716, p = .000, partial eta squared = .06, adjusted R^2 = .054; and Self-monitoring, F (1, 239) = 8.442, p = .004, partial eta squared = .03, adjusted R^2 = .030. The effect size, calculated using partial eta squared, was considered small for learning motivation, interpersonal communication, and self-monitoring, and medium for planning and implementation based on Cohen's (1988) guideline. These represent 3% to 5% of variance in each dependent variable, which can be explained by gender. Overall, the findings of the study suggest that females and males significantly differ in each aspect of Learning Motivation, Planning and Implementation, Interpersonal Communication, and Self-monitoring. Of all the four dependent variables, Planning and Implementation has a medium impact caused by gender. These findings are congruent with a recent study by Okwuduba et al. (2021), who reported that gender made a significant impact on learners' academic performance through SDL.

Lastly, an analysis of the mean scores displayed

Table 4. Test between Subject Effect of Dependent Variables and Gender (n = 241)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected model	Learning motivation	112.716[a]	1	112.716	7.505	.007*	.030
	Planning & implementation	175.400[b]	1	175.400	8.313	.004*	.034
	Interpersonal communication	91.935[c]	1	91.935	14.716	.000*	.058
	Self-monitoring	57.109[d]	1	57.109	8.442	.004*	.034
Gender	Learning motivation	112.716	1	112.716	7.505	.007	.030
	Planning & implementation	175.400	1	175.400	8.313	.004	.034
	Interpersonal communication	91.935	1	91.935	14.716	.000	.058
	Self-monitoring	57.109	1	57.109	8.442	.004	.034
Error	Learning motivation	3589.533	239	15.019			
	Planning & implementation	5043.040	239	21.101			
	Interpersonal communication	1493.078	239	6.247			
	Self-monitoring	1616.866	239	6.765			

a. R Squared = .030 (Adjusted R Squared = .026)

b. R Squared = .034 (Adjusted R Squared = .030)

c. R Squared = .058 (Adjusted R Squared = .054)

d. R Squared = .034 (Adjusted R Squared = .030)

*P < .0125

in Table 5 indicate that male nurses reported higher levels of Learning Motivation (M = 27.06, SD = 3.09), Planning and Implementation (M = 27.00, SD = 2.97), Interpersonal Communication (M = 18.19, SD = 2.01), and Self-monitoring (M = 17.94, SD = 2.02) than female nurses in elearning nursing programs. These findings indicate that males performed better than females in terms of their ability for self-direction. The findings of the study concur with Lee et al. (2020), who reported that male student nurses have a higher level of self-directed learning. However, the researchers found that males are more likely to drop out from the nursing programs. Male nursing students might have a lower sense of self-worth in this female-dominated field, which may pose as a challenge for them to continue with the course (Hodges et al., 2017). As male nurses are the minority group in the Bachelor of Nursing programs in this study, they should be provided the same support in using the SDL strategy to strengthen and boost their confidence. Facilitating the male students to identify and work on their strength to self-direct and adapt to the nursing settings would motivate these male students to complete their studies. In the long run, more male students can be encouraged to join the nursing field. Nevertheless, support for female students cannot be less emphasized. Designing different SDL strategies to suit the gender differences may also be considered in a further study.

As supported by Dadgar et al. (2020), emotional well-being has a role in the effect of SDL on elearning among nursing students. Faculty competency when dealing with emotional support in elearning matters plays a substantial role in enhancing the emotional well-being of students. As a result,

Table 5. Descriptive Data of Gender and Dependent Variables (n = 241)

Dependent variable	Gender	Mean (M)	Standard Deviation (SD)
Learning motivation	Female	24.315	3.922
	Male	27.062	3.086
Planning & implementation	Female	23.573	4.682
	Male	27.000	2.966
Interpersonal communication	Female	15.706	2.528
	Male	18.187	2.007
Self-monitoring	Female	15.982	2.635
	Male	17.937	2.015

the positive emotional interactions between faculty and students could improve students' participation in the elearning process. As such, future studies may consider the effect of emotional well-being on SDL so that researchers could better understand if psychological factors impact the SDL variables. With this, the needs of the working adults can be further enhanced within the nursing context.

IMPLICATIONS FOR NURSING EDUCATION

Theoretically, the outcomes of the study support the concepts of SDL in elearning nursing education. The model suggests that gender is a significant factor on students' level of SDL. Higher educational institutions can consider gender differences to improve the overall SDL of nursing students and their chances to achieve academic success. It is the responsibility of the faculty to learn how to actively engage students using the online interface and software while providing SDL enhancement according to gender. The educators can prepare online materials by creating voice-over power-point, micro-learning video, gamification, or iLecture for students to learn the content prior to online tutorial or flipped classroom. With this, the students can review the learning materials at their own time and pace without having to go through the theories or concepts during the online interface. A more in-depth discussion for scenario-based activities or problem-based learning (Wong et al., 2021) can further stimulate students to reflect, relate, and think critically, and ultimately enhance their ability for self-direction and life-long learning.

LIMITATIONS OF THE STUDY

Due to the larger sample number of female than male students in the study, the findings may not be generalized to male students in the future as more nursing institutions are adopting elearning or online learning mode for undergraduate nursing programs. Also, many confounding variables beyond my control could have impacted the students' perception on their ability for using SDL in their studies. These uncontrolled variables may include the demographic background of the participants, the quality of the elearning systems, the quality of educators/facilitators, the quality of the university resources, and the student support system for each study site.

CONCLUSION

The study reveals a high level of overall SDL among working nurses in elearning nursing programs in Malaysia, and that gender does differ significantly in overall SDL use and in each aspect of Learning Motivation, Interpersonal Communication, Self-Monitoring, and Planning and Implementation. The model derived from this study enables educators to better understand and put into practice the important concepts of SDL in higher education, particularly, in elearning nursing programs. The findings of the study imply that educators in higher education institutions, especially in online nursing education, should focus not only on elearning quality parameters but also on the type of pedagogical method to be implemented. Learning may be more effective when educators/facilitators focus on SDL strategies while upgrading the quality of elearning information systems. It is evident that online learning will stay in the education system worldwide, either in a blended mode approach or as a fully online distance learning mode. What is important is what the SDL approach should be and how it can be integrated in elearning nursing undergraduate programs to promote success.

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DECLARATION OF INTEREST STATEMENT

I declare that there is no conflict of interest that may have inappropriately influenced me in writing this paper.

References

Adams, D., Sumintono, B., Mohamed, A., & Mohamad Noor, M. S. (2018). E-learning readiness among students of diverse backgrounds in a leading Malaysian higher education institution. Malaysian Journal of Learning and Instruction, 15(2), 227–256. https://doi.org/10.32890/mjli2018.15.2.9

Alharbi, H. A. (2018). Readiness for self-directed learning: How bridging and traditional nursing students differs? Nurse Education Today, 61, 231–234. https://doi.org/10.1016/j.nedt.2017.12.002

Bonk, C. J., Zhu, M., Kim, M., Xu, S., Sabir, N., & Sari, A. R. (2018). Pushing toward a more personalized MOOC: Exploring instructor selected activities, resources, and technologies for MOOC design and implementation. International Review of Research in Open and Distributed Learning, 19(4), 92–115. https://doi.org/10.19173/irrodl.v19i4.3439

Chang, W. C., Eh Jun, E., Souriappan, E. S, Kanagasundram, N., & Mani, S. (2022). Self-directed learning readiness among nurses in Malaysia. REAL in Nursing Journal, 5(1), 1–7. http://dx.doi.org/10.32883/rnj.v5i1.1651.g642

Cheng, S. F., Kuo, C. L., Lin, K. C., & Lee-Hsieh, J. (2010). Development and preliminary testing of a self-rating instrument to measure self-directed learning abilities of nursing students. International Journal of Nursing Studies, 47(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

Cohen, J. W. (1988). Statistical power analysis for the behavioral science (2nd ed.). Lawrence Erlbaum Associates.

Dadgar, Z., Fallah, V., & Taheri, F. (2020). Mediating role of emotional well-being in the effect of metacognitive learning and self-directed learning on the level of e-learning in the managers of universities. Journal of Nursing and Midwifery Sciences, 7, 112–119. https://doi.org/10.4103/JNMS.JNMS

Eka, N. G. A., Houghty, G. S., & Juniarta, J. (2019). Motivation and self-learning readiness of blended learning in research and statistics course for undergraduate nursing students. Journal of Holistic Mathematics Education, 3(1), 32–43. https://dx.doi.org/10.19166/johme.v3i1.1919

Grande, R. A. N., Berdida, D. J. E., Cruz, J. P., Cometa-Manalo, R. J., Balace, A. B. B., & Ramirez, S. H. (2022). Academic motivation and self-directed learning readiness of nursing students during the COVID-19 pandemic in three countries: A cross sectional study. Nursing Forum, 57, 382–392. https://doi.org/10.1111/nuf.12698

Hodges, E. A., Rowsey, P. J., Gray, T. F., Kneipp, S. M., Giscombe, C. W., Foster, B. B., Alexander, G. R., & Kowlowitz, V. (2017). Bridging the gender divide: Facilitating the educational path for men in nursing. Journal of Nursing Education, 56(5), 295–299. https://doi.org/ 10.3928/01484834-20170421-08

Knowles, M. S. (1975). Self-directed learning: A guide for learners and teachers. Association Press.

Koirala, N., & Kafle, S. P. (2021). Self-directed learning readiness of the undergraduate nursing students: A study from Eastern Nepal. Birat Journal of Health Sciences, 6(1), 1263–1268. https://doi.org/10.3126/bjhs.v6i1.37553

Lee, S., Kim, D. H., & Chae, S.-M. (2020). Self-directed learning and professional values of nursing students. Nurse Education in Practice, 42, 102647. https://doi.org/10.1016/j.nepr.2019.102647

Meng, L. N, Zhang, X. H., Lei, M. J., Liu, Y. Q., Liu, T. T., & Jin, C. D. (2019). Relationship between self-directed learning readiness, learning attitude, and self-efficacy of nursing undergraduates. Frontier Nursing, 6(4), 341–348. https://doi.org/10.2478/FON-2019-0043

Ministry of Higher Education Malaysia. (2010). Development of nursing education in Malaysia: towards the year 2020. University Publication Center (UPENA). https://www.moe.gov.my/images/Terbitan/Rujukan-Akademik/Development%20of%20Nursing%20Education%20in%20Malaysia%20Towards%20the%20Year%202020.pdf

Nasri, N. M. (2019). Self-directed learning through the eyes of teacher educators. Kasetsart Journal of Social Sciences, 40(1) 164–171. https://doi.org/10.1016/j.kjss.2017.08.006

Nurcan, E., & Saide, F., (2018). Investigating the relationship between self-directed learning readiness and time management skills in Turkish undergraduate nursing students. Nursing Education Perspectives, 39(2), E2–E5. https://doi.org/10.1097/01.NEP.0000000000000279

Okwuduba, E. N., Nwosu, K. C., Okigbo, E. C., Samuel, N. N., & Achugbu, C. (2021). Impact of intrapersonal and interpersonal emotional intelligence and self-directed learning on academic performance among pre-university science students. Heliyon, 7(3), E06611. https://doi.org/10.1016/j.heliyon.2021.e06611

Örs, M. (2018). The self-directed learning readiness level of the undergraduate students of midwife and nurse in terms of sustainability in nursing and midwifery education. Sustainability, 10(10), 3574. https://doi.org/10.3390/su10103574

Pallant, J. (2020). SPSS survival manual: A step by step guide to data analysis using SPSS (7th ed.). Allen & Unwin.

Qamata-Mtshali, N., & Bruce, J. C. (2018). Self-directed learning readiness is independent of teaching and learning approach in undergraduate nursing education. Nurse Educator, 43(5), 277–281. https://doi.org/10.1097/NNE.0000000000000493

Ramli, N., Muljono, P., & Afendi, F. M. (2018). The influencing factors of self-directed learning readiness and academic

achievement. Jurnal Kependididkan, 2(1), 153–166. https://doi.org/10.21831/jk.v2i1.15307

Rascón-Hernán, C., Fullana-Noell, J., Fuentes-Pumarola, C., Romero-Collado, A., Vila-Vidal, D., & Ballester-Ferrando, D. (2019). Measuring self-directed learning readiness in health science undergraduates: A cross-sectional study. Nurse Education Today, 83, 104201. https://doi.org/10.1016/j.nedt.2019.08.019

Samarasooriya, R. C., Park, J., Yoon, S. H., Oh, J., & Baek, S. (2019). Self-directed learning among nurse learners in Sri Lanka. The Journal of Continuing Education in Nursing, 50(1), 41–48. https://doi.org/10.3928/00220124-20190102-09

Thiagraj, M., Abdul Karim, A. M., & Veloo, A. (2021). Using reflective practices to explore postgraduate students self-directed learning readiness in mobile learning platform and task-centered activity. Turkish Online Journal of Distance Education, 22(2), 192–205. https://doi.org/10.17718/tojde.906853

Torun, E. D. (2020). Online distance learning in higher education: E-learning readiness as a predictor of academic achievement. Open Praxis, 12(2), 191–208. https://dx.doi.org/10.5944/openpraxis.12.2.1092

Wong, F. M. F., Tang, A. C. Y., & Cheng, W. L. S. (2021). Factors associated with self-directed learning among undergraduate nursing students: A systematic review. Nurse Education Today, 104, 104998. https://doi.org/10.1016/j.nedt.2021.104998

Yeoh, S. L., & Wee, E. H. (2017). Using technology acceptance model to examine the usage of information and communications technology among nursing students. In G. B. Teh & S. C. Choy (Eds.), Empowering 21st century learners through holistic and enterprising learning (pp. 31–40). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4241-6_4