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Higher Education 4.0: The Effects of Blended Learning on Students' Motivation and Self-Learning Readiness

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Blended learning is expected to provide a better outcome than traditional face-to-face learning. This article aimed to assess the implementation of blended learning in a research and statistics course and its significant effect on students' motivation and self-learning readiness after the intervention. The participants involved in this research were nursing students in the research and statistics course at the Faculty of Nursing, Universitas Pelita Harapan. Pre-experimental research was conducted by comparing the scores of the students' academic motivation and self-directed learning readiness (SDLR) in pre-test and post-test. A total of 181 students were involved in the pre-test and 68 students in the post-test. The analysis result revealed that there was a significant change in the SDLR score, proven by the Wilcoxon signed-rank test analysis (Z -2.442, p-value 0.015, r -0.15). This research concluded that students' SDLR scores were significantly lower in the post-test than in the pre-test. On the other hand, students' academic motivation did not change statistically. It seems that blended learning affects students' SDLR but not their motivation. There is a further need to explore the benefits of blended learning, especially in nursing education.

Key words: *Blended Learning, Nursing Students, Pre-Experimental Research.*

Introduction

Blended learning is a method for teaching and learning by using many sources, that unites online and traditional face-to-face learning (Dziuban et al., 2018; Wright & Hill, 2015). This type of learning provides course materials that could be presented online, from multi-sources, and promotes student-centred learning (Zainuddin & Muftia Keumala, 2018). Self-directed learning (SDL) is further proposed as the primary approach to support blended learning (Gagnon et al., 2013). SDL is also a potential learning method for education in health-care

professions (Shang & Liu, 2018). The SDL method has been applied in varied healthcare education, but it is noted that there were few SDL studies regarding its impact on learning outcomes (Murad & Varkey, 2008).

Self-Directed Learning Readiness/SDLR concept is "the degree [to which] the individual possesses the attitudes, abilities, and personality characteristics necessary for self-directed learning" (Fisher & King, 2010). In healthcare settings, Fisher and colleagues developed an SDLR questionnaire for Nursing Education (Fisher et al., 2001). Fisher and King also reassessed the SDLR questionnaire and provided its validity and reliability (Fisher & King, 2010). This SDLR questionnaire has also been adapted in Indonesian nursing education (Saha, 2006). An Indonesian study by Saha has implemented educational intervention to improve nursing students' SDLR (Saha, 2006).

Not only SDLR, but academic motivation is also essential in blended learning (Gagnon et al., 2013). An individual's natural drive is intrinsically motivated when an individual is contented in his/her psychological needs (Deci & Ryan, 2000, 2008b). Vallerand and colleagues have developed an instrument to examine academic motivation called Academic Motivation Scale/AMS (Guay et al., 2015; Vallerand et al., 1992). Natalya and Purwanto translated and validated the AMS by Vallerand and colleagues into the Indonesian context (30 items) with Cronbach's alpha values ranging from 0.746 to 0.898 (Natalya & Purwanto, 2018). The AMS-Indonesian version comprises three sub-dimensions: Intrinsic Motivation, Extrinsic Motivation, and Amotivation (Natalya & Purwanto, 2018).

Academic motivation may influence the relationship between teaching methods and SDLR (Gagnon et al., 2013). Gagnon and colleagues claimed that blended learning as a teaching method is only suitable for some students based on the students' motivation and SDLR (Gagnon et al., 2013). However, motivation is crucial in the academic field, and students' motivation influences their learning outcomes (Deci & Ryan, 2008a).

Faculty of Nursing (FoN) Universitas Pelita Harapan (UPH), supported by DIKTI (Directorate of Higher Education in Indonesia), has developed a Research and Statistics (RS) course using blended learning. In the implementation of this blended learning course, it is essential to explore students' motivation and self-readiness to know whether both could affect students' involvement in the blended learning process (Deci & Ryan, 2008a; Gagnon et al., 2013).

This study aimed to assess the implementation of blended learning in a research and statistics course and its significant effects on students' motivation and self-learning readiness after the blended learning implementation at FoN UPH.

Methods

This study was pre-experimental research at FoN UPH. Two-times tests were employed to measure the students' academic motivation and self-learning readiness/SLR after mid and final examinations. Univariate and bivariate analyses were applied in this study. A descriptive statistics analysis was conducted to describe the students' academic motivation and SDLR (Eka, Houghty & Juniarta, 2019). Based on the Kolmogorov-Smirnov test for normal distribution test purposes, both AMS and SDLR scores were non-normal (p-value <0.05). Thus, a non-parametric test named Wilcoxon signed-rank test analysis was applied to compare scores between students' pre-test and post-test scores (academic motivation and SDLR). Moreover, the Mochtar Riady Institute for Nanotechnology Ethics Committee approved this study and issued the ethical clearance (No. 016/MRIN-EC/ECL/X/2018). FoN UPH also provided permission for conducting this current study.

The adapted Academic Motivation Scale/AMS (Natalya & Purwanto, 2018; Vallerand et al., 1992) and Self-Directed Learning Readiness Scale/SDLR for Nursing Education (Fisher & King, 2010) were translated and tested for their validity and reliability. Cronbach's alphas of both questionnaires (AMS and SDLR) were above 0.8 (good reliability) (Field, 2013). However, some questions were revised due to their validity test results and readability in the Indonesian language.

The AMS-Indonesian version (30 items) was divided into three dimensions: Intrinsic Motivation, Extrinsic Motivation, and Amotivation (Natalya & Purwanto, 2018). The intrinsic motivation consisted of three sub-dimensions: intrinsic motivation to know /IMTK (four items), intrinsic motivation to accomplish things/IMTA (four items), and intrinsic motivation to experience stimulation/IMES (four items). The extrinsic motivation comprised three sub-dimensions: external regulation/EMER (four items), introjected regulation/EMIN (four items) and identified regulation/EMID (four items). The autonomous motivation/AMOT included six items with no sub-dimension. The original AMS-Indonesian version was a 6-point Likert scale (1 does not correspond at all, to 6 corresponds well) (Natalya & Purwanto, 2018). This study applied a 4-point Likert scale by eliminating 2 points in the middle (3 and 4 from the original AMS Indonesian version) identified as "moderate." The reason was to provide a clear-cut questionnaire that respondents could comprehend and choose to represent their academic motivation.

The SDLR for Nursing Education by Fisher & King (40 items) was assigned into three sub-dimensions: self-management (13 items), desire for learning (12 items), and self-control (15 items) (Fisher & King, 2010). The original SDLR version by Fisher was a 5-point Likert scale (1 strongly disagree to 5 strongly agree). This study applied a 4-point Likert scale by eliminating "unsure" in the middle of the scale. It was assumed that respondents were likely to choose the 'unsure' scale than decide to disagree or agree. Also, the change of the Likert scale

influenced the overall score. The original overall scores ranged from 40-200, and this current study's overall score ranged from 40-160. Higher scores reflect stronger SDLR.

Results and Discussion

A total of 181 students were involved in the pre-test and 68 students in the post-test of the study. The characteristics of participants can be seen in Table 1.

Table 1. Characteristics of respondents

Characteristics	Pre-test (N181) N (%)	Post-test (N 68) N (%)
Gender		
Female	148 (81.8)	52 (76.47)
Male	33 (18.2)	16 (23.53)
Origin		
West part of Indonesia	114 (63)	28(41.17)
Central part of Indonesia	38 (21)	23(33.82)
East part of Indonesia	29 (16)	17(25.01)
Previous of high school type		
Private	44 (24.3)	15(22.05)
Public	119 (65.7)	39(57.35)
Vocational	18 (9.9)	14(20.6)

Table 1 shows that most of the respondents were female (pre-test 81.8%; post-test 76.47%). Half of them came from the western part of Indonesia (pre-test 63%; post-test 41.17%) and as public high school graduates (pre-test 65.7%; post-test 57.35%).

The characteristics of the participants in this study represented the population of nursing students in Indonesia and abroad. For example, in China, male nurses were less than 1% of the total population of nurses (Wang et al., 2011). Most of the participants were also from the western part of Indonesia; as expected, the nursing school was in the same location. Besides, most of the students graduated from public high schools, and the reason could be public schools were affordable since all students were scholarship recipients.

Table 2. Respondents' experiences of blended learning

Have ever experienced blended learning	Pre-test (N181) N (%)	Post-test (N 68) N (%)
Yes	86 (47.5)	34(50)
No	95 (52.5)	34(50)
When experiencing blended learning for the first time		
Junior high School	5 (2.8)	0
High School	15 (8.3)	9(13.24)
Current Nursing School	161 (89)	59(86.76)

Based on Table 2, half of the participants have never experienced blended learning (pre-test 52.5%; post-test 50%), and most of them mentioned that their first experience of blended learning was at their current nursing school (pre-test 89%; post-test 86.76%). As mentioned before, the participants were in their fifth semester and involved in blended learning since their first semester.

Table 3. Academic Motivation of The Respondents

Academic Motivation		Group	n	Mean	Median	Min	Max	SD	p-value
Intrinsic Motivation	Intrinsic Motivation to Know	Pre-test	181	3.35	3.25	2	4	0.420	0.677
		Post-test	68	3.32	3.25	2.75	4	0.38	
	Intrinsic Motivation to Accomplish things	Pre-test	181	3.20	3	3	4	0.361	0.954
		Post-test	68	3.18	3	2.25	4	0.42	
	Intrinsic Motivation to Experienced Stimulation	Pre-test	181	3.14	3	2	4	0.406	0.381
		Post-test	68	3.15	3	2.25	4	0.44	
Extrinsic Motivation	External Regulation	Pre-test	181	2.99	3	1	4	0.548	0.381
		Post-test	68	3.05	3	2	4	0.52	
	Introjected Regulation	Pre-test	181	3.14	3	2	4	0.389	0.954
		Post-test	68	3.18	3	2.25	4	0.43	
	Identified Regulation	Pre-test	181	3.25	3.25	3	4	0.414	0.434
		Post-test	68	3.25	3	2.5	4	0.42	
Amotivation		Pre-test	181	1.69	1.67	1	3	0.491	0.362
		Post-test	68	1.76	1.83	1	3.33	0.48	

Table 3 shows that based on the Wilcoxon signed-rank test, there were no significant differences between students' academic motivation in pre and post-study (p-value >0.05). The students' academic motivation was similar for their intrinsic and extrinsic motivation, with a median of ≥ 3. Based on the seven sub-dimensions of AMS-Indonesian (see table 3), both in pre and post-test, the highest score was IMTK (Mdn 3.25), and the lowest score was Amotivation (Mdn 1.67 & 1.83). This finding also means that the students experienced happiness and satisfaction when exploring something new in the blended learning course of RS either before or after the mid-semester (Guay et al., 2015; Natalya & Purwanto, 2018).

Regarding the self-directed learning readiness of the students, table 4 reveals that there was a significant difference in students' SDLR (total scores) between pre-test and post-test with a p-value of 0.015. However, based on each sub-dimension, only self-management of the respondents changed significantly (p-value <0.0001).

Table 4. Self-directed learning readiness of the respondents

SDLR	Group	n	Mean	Median	Min	Max	SD	Wilcoxon Signed-Rank Test		
								z	p	r
Self-management	Pre-test	181	31.51	32	24	43	2.845	-5.022	<0.0001	-0.318
	Post-test	68	29.03	29	23	38	2.69			
Desire for learning	Pre-test	181	28.45	28	22	36	2.670	-0.966	0.319	
	Post-test	68	28.37	28	23	34	2.79			
Self-controlled	Pre-test	181	30.21	30	21	38	2.652	-0.011	0.991	
	Post-test	68	30.57	29.5	25	39	3.24			
Total SDLR score	Pre-test	181	90.18	90	74	110	6.648	-2.442	0.015	-0.154
	Post-test	68	87.97	85.5	73	108	7.62			

Table 4 further shows that the total median scores were 90.18 (SD 6.648) with a range of 74-110 in the pre-test and 85.5 (SD 7.62) with a range of 73-108 in the post-test study.

This current study revealed that there were no significant differences in academic students' motivation between their scores in the pre and post-test findings (p-value > 0.05). The students' academic motivation is stable (Mdn ≥ 3) for their intrinsic and extrinsic motivation. This condition also means that while learning research and statistics using blended learning, the students drove their internal energy sources for their activities and obtained positive external values in the course, such as good grades (Deci & Ryan, 2000; Natalya & Purwanto, 2018). Since the students were in their third year, they had already been familiar with blended learning; thus, their motivation to learn was already high (Mdn ≥ 3) from the beginning of the course. The high motivation continued until they finished their course of research and statistics.

This study also showed that students' motivation at FoN was more intrinsic than extrinsic in both tests (pre-post). Students with higher intrinsic motivation could perform better in their learning venture, and they also experienced a lack of attrition and lack of anxiety (Próspero & Vohra-Gupta, 2007). On the other hand, a previous study in Saudi Arabia compared students' motivation in various academic levels, including health-care education (Elbsuony, 2016). This Arabian study revealed that the scores of students' extrinsic motivation were higher than their intrinsic motivation (Elbsuony, 2016). Students with higher extrinsic motivation will have a strong commitment to selecting their career (Gambino, 2010).

Regarding students' SDLR, there was a significant difference in students' SDLR (total scores) between the mid and final semester (p-value 0.015, r -0.154). This result also means that the students' SDLR scores were significantly lower in the post-test (Mdn 85.5) than in the pre-test (Mdn 90). However, the students' SDLR scores are still at a moderate level. The students may have succeeded individually, yet they needed more self-confidence to identify, plan, and implement their learning needs (Guglielmino & Guglielmino, 2019). Moreover, from the three-sub dimensions of the SDLR, only self-management of the respondents changed significantly (p-value <0.0001, r -0.318). This result also means that the students' self-management scores were significantly lower in the post-test (Mdn 29) than in the pre-test (Mdn 32). It indicates that educators should pay attention to maintain students' self-management skills.

Though in different fields of academic areas, a study in Semarang Indonesia supported this current study. Their students' scores of SDLR were low to moderate (Lestari & Widjajakusumah, 2009), and a study in China also revealed almost similar results with students having intermediate to higher SDLR (Yang & Jiang, 2014). On the other hand, two previous studies in Jordan and Iran found that their students' scores of SDLR were relatively high (Abu-Moghli et al., 2005; Safavi et al., 2010). A previous study discussed that SDLR was not a good fit for every student (Gagnon et al., 2013) since it might lead to several students experiencing nervousness and discontent (Örs, 2018). Students' SDLR can be supported by adopting the use of several teaching methods such as problem-based learning (PBL) and small-group learning (Alkorashy & Assi, 2016; Örs, 2018; Yuan et al., 2012). Therefore, it is recommended, as mentioned earlier, that the teaching methods could be applied in an education setting – in this case, nursing education – to develop the students' self-directed learning abilities.

Based on the three sub-dimensions of SDLR – self-management, desire for learning, and self-control – this current study revealed that the self-management subscale had the highest median score (32) with SD 2.845 in the pre-test. They were followed by self-control subscale (median 30; SD 2.652) and the desire for learning subscale, revealing the lowest median score (28) with SD 2.670 (see table 4). On the other hand, in the post-test, the self-control subscale had the highest median score (29.5) with SD 3.24, followed by self-management (median 29. SD 2.69) and the desire for learning as the lowest (median 28; SD 2.79). These findings (in pre-post test)

indicated that students needed support in their passion for learning and the possibility of improvement in their desire for learning area since the beginning of the semester.

The findings of this current study regarding the SDLR subscales score contradicted some previous studies. The studies reported that their students' desire for learning was in the middle to the highest level of the SDLR subscales (El et al., 2017; Örs, 2018; Smedley, 2007). In other words, the respondents of these previous studies enjoyed their learning. Turkey's research revealed that students had the highest score of desire for learning, followed by self-management scores, while nursing students' readiness to self-control score was the lowest (Örs, 2018). A study in Australia further revealed that the students' SDLR score was the weakest in the self-management subscale, followed by the desire in learning and self-control (Smedley, 2007). Similar to the study in Australia, a study in Saudi Arabia found that the students' highest score was self-control, followed by self-desire and self-management subscale as the least (El et al., 2017).

Based on the discussion above, it is noted that students involved in the Research and Statistics course using blended learning had adequate motivation to learn the course. However, it is needed to improve students' desire for learning from the beginning of the course. Further studies are essential to explore other benefits of blended learning to support student-centred learning, especially in nursing education.

Conclusion

This study identified students' motivation and SDLR in their involvement in blended learning while learning research and statistics. It is noted that students' academic motivation was consistently high until they finished their course. However, the students' SDLR score decreased significantly. It also means that student's self-directed learning was needed to be supported, for instance, by using other learning methods, including problem-based learning and learning in small groups. The findings of this study can be used to assist nurse educators in identifying students' needs to provide student-centred learning, especially in the Research and Statistics course.

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REFERENCES

Abu-Moghli, F. A., Khalaf, I. A., Halabi, J. O., & Wardam, L. A. (2005). Jordanian baccalaureate nursing students' perception of their learning styles. *International Nursing Review*, *52*(1), 39–45. https://doi.org/10.1111/j.1466-7657.2004.00235.x

Alkorashy, H. A. E., & Assi, N. E. A. (2016). Readiness for Self-Directed Learning among Bachelor Nursing Students in Saudi Arabia: A Survey-Based Study. *International Journal of Nursing Education and Research*, *4*(2), 187. https://doi.org/10.5958/2454-2660.2016.00038.7

Deci, E. L., & Ryan, R. M. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, *55*(1), 68–78. https://doi.org/10.1002/jsfa.2740050407

Deci, E. L., & Ryan, R. M. (2008a). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology*, *49*(1), 14–23. https://doi.org/10.1037/0708-5591.49.1.14

Deci, E. L., & Ryan, R. M. (2008b). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology*, *49*(3), 182–185. https://doi.org/10.1037/a0012801

Dziuban, C., Graham, C. R., Moskal, P. D., Norberg, A., & Sicilia, N. (2018). Blended learning: the new normal and emerging technologies. *International Journal of Educational Technology in Higher Education*, *15*(1), 1–16. https://doi.org/10.1186/s41239-017-0087-5

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. *JOHME: Journal of Holistic Mathematics Education*, *3*(2), in press. https://doi.org/10.19166/johme.v3i1.1919

El, N., Sofar, S. M., Ali, J., & Al-battawi, I. (2017). Self-directed learning readiness among Nursing Students at King Abdulaziz University, Saudi Arabia. *IOSR Journal of Nursing and Health Science*, *6*(6), 14–24. https://doi.org/10.9790/1959-0606031424

Elbsuony, M. (2016). Correlation between Academic Motivation to Study Nursing and Health-Related Quality of Life among Nursing. *Journal of American Science*. https://doi.org/10.7537/marsjas121216.13.Key

Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics* (4th ed.). SAGE Publications Ltd.

Fisher & King. (2010). The self-directed learning readiness scale for nursing education revisited: A confirmatory factor analysis. *Nurse Education Today*, *30*(1), 44–48. https://doi.org/10.1016/j.nedt.2009.05.020

Fisher, M., King, J., & Tague, G. (2001). Development of a self-directed learning readiness scale for nursing education. *Nurse Education Today*, *21*(7), 516–525. https://doi.org/10.1054/nedt.2001.0589

Gagnon, M., Gagnon, J., Desmartis, M., & Njoya, M. (2013). *The Impact of Blended Teaching on Knowledge, Satisfaction, and Self-Directed Learning in Nursing Undergraduates: A Randomised, Controlled Trial*. *34*(6), 377–383. https://doi.org/10.5480/10-459

Gambino, K. M. (2010). Motivation for entry, occupational commitment and intent to remain: A survey regarding Registered Nurse retention. *Journal of Advanced Nursing*, *66*(11), 2532–2541. https://doi.org/10.1111/j.1365-2648.2010.05426.x

Guay, F., Morin, A. J. S., Litalien, D., Valois, P., & Vallerand, R. J. (2015). Application of exploratory structural equation modeling to evaluate the academic motivation scale. *Journal of Experimental Education*, *83*(1), 51–82. https://doi.org/10.1080/00220973.2013.876231

Guglielmino, L. M., & Guglielmino, P. J. (2019). *Quick Facts about the Self-Directed Learning Readiness Scale (SDLRS)*.

Lestari, E., & Widjajakusumah, D. (2009). Students' self-directed learning readiness, perception toward student-centered learning and predisposition towards student. *Centered Behaviour South East Asian Journal of Medical Education*, *3*(1), 52–56.

Murad, M. H., & Varkey, P. (2008). Medical Education – Review Article Self-directed Learning in Health Professions Education. *Ann Acad Med Singapore*, *37*, 580–590.

Natalya, L., & Purwanto, C. V. (2018). Exploratory and Confirmatory Factor Analysis of the Academic Motivation Scale (AMS)–Bahasa Indonesia. *Makara Human Behavior Studies in Asia*, *22*(1), 29. https://doi.org/10.7454/hubs.asia.2130118

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 (Switzerland)*, *10*(10), 1–14. https://doi.org/10.3390/su10103574

Próspero, M., & Vohra-Gupta, S. (2007). First generation college students: Motivation, integration, and academic achievement. *Community College Journal of Research and Practice*, *31*(12), 963–975. https://doi.org/10.1080/10668920600902051

Safavi, M., Shooshtari Zadeh, S., Mahmoodi, M., & Yarmohammadian, M. (2010). Self-directed learning readiness and learning styles among nursing students of Isfahan University of Medical Sciences. *Iran. J. Med. Educ.*, *10*, 27–35.

Saha, D. (2006). *Improving Indonesian Nursing Students' Self-Directed Learning Readiness* (Issue May).

Shang, F., & Liu, C.-Y. (2018). Blended learning in medical physiology improves nursing students' study efficiency. *Advances in Physiology Education*, *42*(4), 711–717. https://doi.org/10.1152/advan.00021.2018

Smedley, A. (2007). The self-directed learning readiness of first year bachelor of nursing students. *Journal of Research in Nursing*, *12*(4), 373–385. https://doi.org/10.1177/1744987107077532

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Briere, N.M., Senecal, Caroline & Vallieres, E. F. (1992). The Academic Motivation Scale: A Measure of Intrinsic, Extrinsic, and Amotivation in Education. *Educational and Psychological Measurement*, *52*(4), 1003–1017. https://doi.org/10.1177/0013164492052004025

Wang, H., Li, X., Hu, X., Chen, H., Gao, Y., Zhao, H., & Huang, L. (2011). Perceptions of nursing profession and learning experiences of male students in baccalaureate nursing program in Changsha, China. *Nurse Education Today*, *31*(1), 36–42. https://doi.org/10.1016/j.nedt.2010.03.011

Wright, M., & Hill, L. H. (2015). Academic Incivility Among Health Sciences Faculty. *Adult Learning*, *26*(1), 14–20. https://doi.org/10.1177/1045159514558410

Yang, G. F., & Jiang, X. Y. (2014). Self-directed learning readiness and nursing competency among undergraduate nursing students in Fujian province of China. *International Journal of Nursing Sciences*, *1*(3), 255–259. https://doi.org/10.1016/j.ijnss.2014.05.021

Yuan, H. Bin, Williams, B. A., Fang, J. B., & Pang, D. (2012). Chinese baccalaureate nursing students' readiness for self-directed learning. *Nurse Education Today*, *32*(4), 427–431. https://doi.org/10.1016/j.nedt.2011.03.005

Zainuddin, Z., & Muftia Keumala, C. (2018). Blended Learning Method Within Indonesian Higher Education Institutions. *Jurnal Pendidikan Humaniora*, *6*(2), 69–77.