Comparison of the Effects of E-learning Blended with Collaborative Learning and Lecture-Based Teaching Approaches on Academic Self-Efficacy among Undergraduate Nursing Students: A Quasi-Experimental Study

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Abstract

Introduction: Applying new technologies in teaching has led to the phenomenon of blended learning (BL), which is currently flourishing as a specific requirement for higher self-efficacy and success in increasingly complex healthcare environments. Although various forms of novel education are on the rise worldwide, the effects of electronic learning (EL), combined with collaborative learning (CL) and lecture-based teaching (LBT) approaches, have not yet been validated on academic self-efficacy among undergraduate nursing students.

Methods: Utilizing a pre-/post-test comparison-group design, this quasi-experimental study was conducted on 70 undergraduate nursing students of Urmia University of Medical Sciences, Urmia, Iran, selected by the census sampling technique in 2020. The eligible participants were allocated to intervention groups, viz., the EL+LBT group (n=34) and the EL+CL group (n=36). A learning management system (LMS) was used for both intervention groups along with the LBT approach, and then 10 steps were integrated into the CL approach during 14 sessions, lasting 150 minutes. Afterward, a demographic information form and the College Academic Self-Efficacy Scale (CASES) were administered to collect the data. The data were analyzed using descriptive statistics, Chi-square test, independent-samples *t*-test, and analysis of covariance (ANCOVA).

Results: No significant difference was observed in the CASE scores between the students were taught using the EL+LBT (113.76±16.98) and the EL+CL approaches (107.66±16.70) before the interventions (P=0.136). However, the CL+EL approaches resulted in the highest changes in the CASE scores at the pre- (107.66±16.70) and post-test (119.08±25.49) stages (P=0.019). Moreover, the female students attending the CL+EL classrooms experienced significantly positive differences in their CASE scores (127.12±30.34), compared to the males (112.65±19.30) (P=0.011).

Conclusion: Blending the EL and CL approaches significantly promoted CASE among the undergraduate nursing students in this study by providing sufficient collaboration, essential educational equipment, and better technical support.

Keywords: Teaching, Collaborative learning, Electronic, Nursing student, Self-Efficacy

Introduction

Developing more approaches to improve the teaching methods in nursing can drastically change the effectiveness of professional performance among well-educated nurses in terms of performance to successful healthcare outcomes (1). Through the lens of educational curricula, the lecture-based teaching (LBT) approaches combined with new educational technologies can provide a new blended learning (BL) approach for delivering cost-effective, innovative, and reliable education in nursing (2). The model is commonly based on the idea that students learn best when they are taught through a flexible combination of two or more learning components (3). Therefore, electronic learning (EL) plus LBT, integrating the offline and online modes (1), was first introduced and operationalized as a hybrid model in the 1990s by some universities in the United States and Canada (4). From this perspective, Learning Management Systems (LMS) have been essential tools, as driving forces for EL, in almost all higher education institutions (HEIs). According to the Education Center for Analysis and Research (ECAR) at Northern Illinois University (NIU), the United States, 85% and 83% of educators and students in 99% of HEIs had, respectively, tapped the LMS in 2014 (5). The LMS in the Iranian universities of medical sciences has also provided the possibility of exchanging all types of files such as texts, images, and the like (6). The most effective BL courses can thus enhance clinical knowledge, skills (1), communication skills competency, and self-efficacy (7). However, some previous studies have highlighted the main challenges facing BL from the standpoint of students or educators, including self-regulation in using online technologies for learning, suitable teaching technologies, and practical training support to teachers (8, 9), or some problems with educational systems (10). Moreover, some parameters have complicated EL such as the lack of motivation, poor expectations, low-quality teaching, inadequate resources, inconsistency with disciplines and contents (e.g., communication skills and reflective learning), as well as limited information technology (IT) skills (11).

Consistently, the collaborative learning (CL) approach for creating social learning and then developing more positive behaviours have so far solved these challenges, so students might achieve their common goals at different levels of tasks in small groups (12). CL accordingly represents an instructional method in which students, in heterogeneous groups, feel responsible for learning alongside learning from others. Once educators in CL classrooms provide students with feedback on the teaching methods, assignments, and assessment processes, they help these individuals accomplish both short- and long-term goals (13). In this regard, some studies have pointed to the positive effects of CL in different settings on student group skills and learning behaviours (e.g., classroom engagement, motivation for learning, self-confidence (14), anxiety reduction (15), clinical knowledge, competence, satisfaction, and problem-solving skills) (16).

One possible definition for BL is within the Bandura's theory of self-efficacy as the belief in one's ability to reach a specific level of performance to handle some difficult tasks (17). The way students interact with each other, how they are motivated, and in the end what they do is thus determined by their self-efficacy (18). In this regard, four sources of self-efficacy include mastery and experiences, vicarious experiences, verbal persuasion and external support, and negative physiological reactions, such as anxiety, high levels of stress, etc. (19), which can be respected as better predictors of academic achievement than other cognitive or emotional processes (20). Therefore, the impact of higher self-efficacy is multidimensional as it can improve motivation, academic performance, behaviour, approaches, persistence to reach their goals, and so forth (18). This is one of the main features in many health education systems, ensuring that educational programs comply with current standards for teaching and assessing students as well as providing an optimal learning environment that produces professionals empowered enough to apply their skills once faced with complex healthcare systems (21). On the subject of the BL approaches for creating an effective method to improve students' experiences in education, it seems that universities mostly prefer to adopt new methods that have the best educational effectiveness (18). Although the positive results regarding the effectiveness of EL or CL in nursing education have been separately reported (16, 22), a large gap still exists in the BL literature, particularly upon integrating of two or more learning approaches, and then examining different BL ones (e.g., EL+LBT vs. EL+CL). Against this background, the present study compared the effects of BL, here, EL+LBT vs. EL+CL, on the variables within the College Academic Self-Efficacy Scale (CASES) during the Paediatric Nursing Care Course (PNCC) among undergraduate nursing students in 2020.

Methods

Study Design

A quasi-experimental pre-/post-testresearch design with two comparison intervention groups was used to meet the study objectives between September 2020 to July 2021 in the Nursing and Midwifery School of Urmia University of Medical Sciences, Urmia, Iran.

Participants

The fifth-semester undergraduate nursing students recruited in this study were assessed based on the inclusion criteria of being willing to participate in the study, completing the required institutional courses, being enrolled in the PNCC in Autumn and Spring semester 2020 in nursing and midwifery school, and having no prior learning experience about the LMS and CL. In contrast, the nursing students who failed to attend two sessions of group discussion during the intervention period in both groups were excluded.

Sampling

The statistical population consisted of 70 fifth-semester undergraduate students. According to a previous study by Moradi doliskani and colleagues (23), the Mean score and Standard Deviation (SD) in the intervention (flipped classroom method) and control (face-to-face education) groups were 94.48±8.83 and 86.37±5.76, respectively. Based on the estimation of 18 nursing students as the minimum sample size for each group with a confidence interval (CI) of 95% and a test power of 90%, 20 participants were considered in each group with regard to a 10% attrition rate.

$$n = \frac{\left(z_{1-\alpha/2} + z_{1-\beta}\right)^2 (\delta_1^2 + \delta_2^2)^2}{(\mu_1 - \mu_2)^2} =$$

$$\frac{(1.96 + 1.28)^2 (77.96 + 33.17)^2}{(94.48 - 86.37)^2} = 18$$

Intervention

The undergraduate nursing students from non-parallel classrooms were enrolled in the intervention sessions all through two consecutive semesters. First, a baseline assessment was conducted an hour before the first session. An orientation session was then held for all participants at the onset of the study to highlight its importance about increasing the nursing students' awareness of adherence to different learning methods and their practices. All sessions were managed by a paediatric nurse educator who were previously in charge of similar sessions.

Content

The educational content was then developed based on Wong's Nursing Care of Infants and Children, 11th Edition, and the clinical practice guidelines in nursing care advocated in the departments of paediatrics (24). Pediatricians, pediatric nurse practitioners, and the Iranian Virtual University of Medical Sciences further approved the online educational materials provided by the researchers via the Articulate storyline software before the intervention. The materials were delivered on a weekly basis to the participants in both groups during 14 two-part sessions for 150 minutes, by integrating two different teaching methods (75-90 minutes for the lecture or cooperative teaching method). To prevent contamination, the LMS platform was also assigned as the EL condition for both intervention groups.

Group 1: The first-semester nursing students were allocated to the EL+LBT group. The duration of all sessions was 75 minutes, which included a PowerPoint presentation, a demonstration of paediatric nursing care, and a group discussion. Considering the open access to the LMS platform as an EL system in Iranian universities of medical sciences, the nursing students utilized the LMS asynchronous platform to access the online module in PDF or multimedia formats at the end of each educational session (viz., video clips of about 30-75 minutes). During the study, the participants had to use their individual accounts to log in this platform; thus, their educators could monitor whether they had logged in. The research committee and the nursing centre also monitored all phases of the present study.

Group 2: Of note, the second-semester students were allocated to the blended EL and CL conditions. In this line, 10 consecutive steps were designed in the CL approach for the nursing students in a long continuous session for 90 minutes (Table 1). Steps 1-3 could be practiced independently of the remaining ones, and Step 3 was composed of individual workflows. For Steps 4-10, it would suffice to have the direct presence of all students in the same classroom at the same time. The main duties performed by the teachers in this way were to prepare the lesson plans for each session, guide the groups, provide the necessary facilities, evaluate and monitor the groups, and provide feedback. The participants in the second intervention group also received the same online platform training workshop as the second learning method. One week after the end of the interventions in the presence of the researcher, the participants were asked to complete the research tools again.

Table 1: Comparison of Demographic Characteristics between the Two Intervention Groups

Variables		The EL+LBT group[a]	The EL+ CL group[b]	P [c]
		Mean±SD	Mean±SD	
Age		21.64±1.82	22.69±3.12	0.094
Health children's lesson score		14.40±2.06	14.06±2.33	0.609
		Number (Percentage)	Number (Percentage)	P [d]
Gender	Female	18 (52.94%)	16 (44.44%)	0.447
	Male	16 (47.06%)	20 (55.56%)	
Resident status	Dormitory	20 (58.82%)	25 (69.44%)	0.354
	Home	14 (41.18%)	11 (30.56%)	
Clinical work experience	Yes	4 (11.76%)	2 (5.56%)	0.422
	No	30 (88.24%)	34 (94.4%)	
Interesting to nursing filed	Yes	25 (73.53%)	19 (52.78%)	0.071
	No	9 (26.47%)	17 (47.22%)	

[a]The blended E-Learning (EL) and lecture-based Teaching (LBT) methods group; [b]The blended EL and collaborative learning (CL) methods group; [c]The independent t-test was used to compare the groups; statistically significant at P-values<0.05; [d]Chi-square test was used to assess the difference in the distribution of a categorical variable between two independent groups.

Instrument

The data collection tools consisted of two parts: a demographic information form and the College Academic Self-Efficacy Scale (CASES) developed by Owen and Froman (22), which was an Iranian sort translated into the Persian language for the students by Shokri et al. (2012). The CASES included 33 items with a five-point Likert-type indicating their level or amount of confidence, ranging from five (a lot) to one (very little). The sum of all 33 items accordingly yielded a final composite score, with a range of 33-165. The CASES composite score was also derived from the mean score. Higher self-efficacy was thus indicated by higher scores [130–165] and lower self-efficacy was shown by lower scores [33–99]. Of note, the face and content validity of the data collection tools were confirmed by nursing students and some faculty members. Reliability and validity of the questionnaire were respectively checked using the Cronbach alpha coefficient formula (α=0.72–0.83) and Exploratory Factor Analysis (EFA) with four factors which explained 65.320% of the general factor variance of academic self-efficacy beliefs among students. The Confirmatory Factor Analysis (CFA) with obliging rotation was χ^2=205.545, df=73, P<0.01; CFI=0.948; TLI=0.935; RMSEA=0.056 (90% confidence interval 0.047–0.066); SRMR=0.049 (25).

Age, gender, the lesson score of healthy child nursing, clinical experience, interest in their discipline history of probation in a semester, and place of residence were considered in the demographic information form. The participants completed two questionnaires at the first and final sessions of the class in each semester.

Data Analysis

All statistical analyses were performed using the SPSS Statistics software (ver.24) (IBM Corp., Somers, N.Y., the United States). Kolmogorov-Smirnov test was thus employed to assess the normality of the variables. Accordingly, the assumption of normality was confirmed for all variables. In the present study, descriptive statistics, viz., Mean±SD, percentage, and frequency were further employed to describe the participants' characteristics. The Chi-square test and independent-samples *t*-test were respectively used to compare the qualitative and quantitative demographic data between the intervention groups. To examine the effect of CASES in both BL-based approaches, we also used the paired-samples *t*-test, while the one-way ANCOVA (analysis of covariance) test to analyse the difference between the pre-and post-test mean scores of the CASEs in the BL methods, controlling for the pre-test mean scores.

Ethical Consideration

This study was registered to the Urmia Nursing and Midwifery School Research Committee, Iran (no.1397-06-33-1565) and approved by the Ethics Committee of Urmia University of Medical Sciences (IR.UMSU.REC. 1397.146). All nursing students who were eligible to participate in this study were invited to a welcome session. The purpose of the research and the possible questions of the participants were answered. Students were also assured of the privacy and confidentiality of their information. The nature of the participation was voluntary and they could leave the study at any given time. It was also confirmed that the participation or non-participation of students would not affect their grades. Nursing students who wished to participate in the study signed an informed consent form.

Results

Firstly, 70 eligible participants were selected out of 80 undergraduate nursing students, using
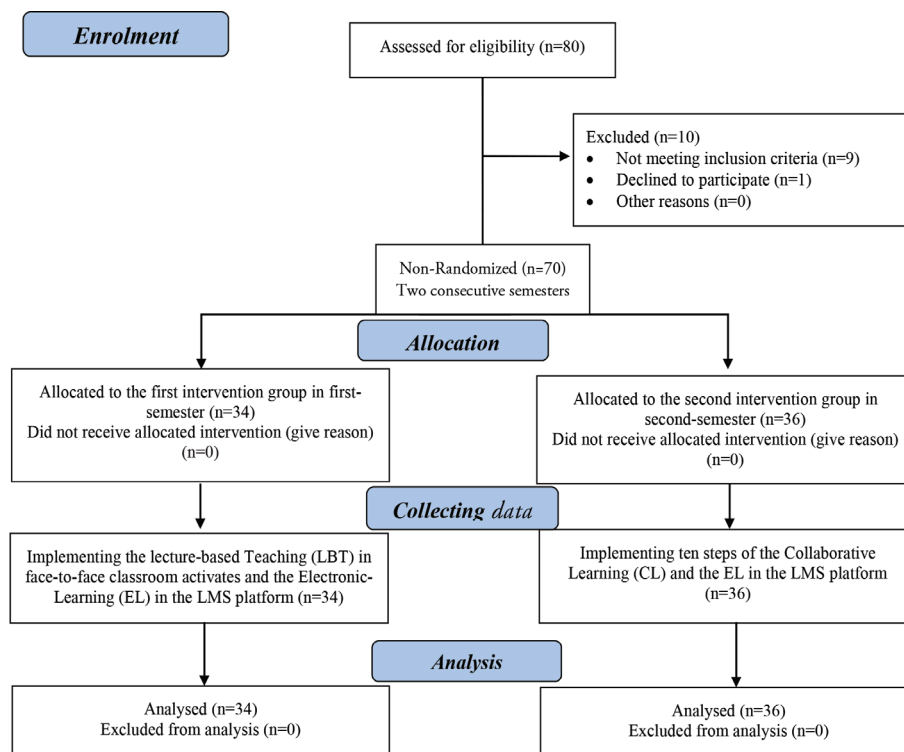
Figure 1: Graphical representation of the research procedure, based on Consort statement 2012. It indicates the participants' recruitment and intervention process.

the census sampling technique and the inclusion criteria. At the post-test stage, all the students (100% response rate) completed the questionnaires and took part in the study (Figure 1).

The mean age in the EL+LBT and the EL+CL groups was 21.64±1.82 and 22.69±3.12, respectively (P=0.090). The Chi-square test results indicated that both groups were homogenous in terms of variables of gender, place of living, resident status, clinical work experience, and interest in nursing. Furthermore, there was no statistically significant difference between the ages range of the study groups (P>0.05) (Table 1).

Before the ANCOVA, its assumptions, such as the homogeneity of the regression slope, homogeneity of variance, and normal distribution of data were evaluated. The assessment of homogeneity of variances using Levene's test demonstrated that the resulting significance level was higher than 0.05, so the assumption of homogeneity of variance was confirmed (F=3.359, P=0.071). Furthermore, the assumption of the normal distribution of data using the Kolmogorov-Smirnov test showed that given the significance level was higher than 0.05 in this test, and there was no significant difference between the distribution of scores and normal distribution. The normal distribution assumption was thus met, making it possible to implement the ANCOVA (Table 2).

According to Table 3, the mean scores in both

study groups were not significantly different at the pre-test stage, but a rising trend was observed in the CASES scores in both intervention groups in the post-test one. The ANCOVA was also employed to determine the significance of the changes. The given teaching approaches resulted in no significant difference between both study groups regarding the CASES scores (F=0.075, P=0.785, Eta^2=0.001) (Table 3). The partial Eta^2 value was then recruited to define the amount of variance in the dependent variable (CASE mean scores) by the independent variable (viz., both BL approaches) (0.01%), which was considered very small. It is worth noting that the sample size decreased the statistical power of the study and increased the margin of error, so the study was interpreted meaninglessly.

For further analysis, the independent-samples t-test results indicated no significant difference between the CASES scores of the students receiving the EL+LBT (113.17±17.07) and EL+CL approaches (107.6±16.70) before the interventions (P>0.05). After the interventions, the CL+EL approach could boost the students' CASES scores (11.42±27.88) more than the EL+LBT one (6.09±21.15). However, the independent-samples t-test was conducted based on the difference between the mean scores of the pre- and post-test stages in both intervention groups, which showed no statistical discrepancy (P=0.373). The paired-samples *t*-test outcomes also revealed

Table 2: Investigating the ANCOVA assumptions for the College Academic Self-Efficacy

Intervention groups	Stage	Mean±SD	Kolmogorov-Smirnov			Levene's test			
			Statistic	df	P	F	df1	df2	P
The EL+LBT group[a]	Pretest	113.76±16.98	0.119	34	0.200	3.359	1	68	0.071
	Post-test	119.264±18.60	0.162	34	0.024				
The EL+CL group[b]	Pretest	107.66±16.70	0.135	36	0.096				
	Post-test	119.08±25.49	0.130	36	0.132				

[a]The blended E-Learning (EL) and lecture-based Teaching (LBT) methods group; [b]The blended e-learning (EL) and collaborative learning (CL) methods group.

Table 3: Mean and Standard Deviation of the College Academic Self-Efficacy in Pre-test and Post-test and Results of ANCOVA Test of both Intervention Groups in the Post-test Stage

Source	Sum of Squares	df	Mean Square	F	P	Partial Eta Squared	Observed Power
Pre-test	1714.907	1	1714.907	3.540	0.064	0.050	0.458
Group	36.349	1	36.349	0.075	0.785	0.001	0.058
Error	32460.461	67	484.484				
Total	1028304.000	70					

Table 4: Comparison of the Mean Score of the College Academic Self-Efficacy Score in the Intervention Groups

The College Academic Self-Efficacies score	Before intervention	After intervention	95% CI[c]		Statistic tests	
	Mean±SD	Mean±SD	Lower	Upper	t	P values[d]
The EL+LBT group[a]	113.17±16.98	119.26±18.60	-1.291	13.466	1.678	0.103
The EL+CL group[b]	107.66±16.70	119.08±25.49	1.983	20.849	2.457	0.019

[a]The blended E-Learning (EL) and lecture-based Teaching (LBT) group; [b]The blended e-learning (EL) and collaborative learning (CL) group; [c]Confidence Interval; [d]Paired t-test was used to compare the means and standard deviations within intervention groups. The significant P-value was less than 0.05.

no significant difference between the pre- and post-test mean scores in the EL+LBT group (P=0.103), while those who received the CL+EL reflected significantly larger positive changes in their self-efficacy (t(35)=2.457; P=0.019) (Table 4). In addition, the paired samples *t*-test results showed that female students in CL and EL integrated learning methods had significant positive differences in CASES mean scores (127.12±30.34), as compared to the males (112.65±19.30) (t(15)=2.904; P=0.011).

Discussion

This study compared the effects of two BL approaches (EL+LBT vs. CL+EL) on the CASEs variables among undergraduate nursing students. In this regard, the most significant findings were associated with the modified teaching schemas through the integration of EL and CL, which could statistically promote the CASES variables among the selected groups, especially the female nursing students. To the best of the authors' knowledge, no study was found using the blended EL and CL in association with the CASE variables. Therefore, the study findings were compared with the EL and CL methods separately, and the outcomes reported in other investigations were confirmed. Similar results had been further obtained in previous research,

supporting that high academic self-efficacy was reliable predictors of academic achievement in online courses (26) and during CL (27). Nevertheless, the students' willingness to engage more in teaching was more than that in the EL and CL methods (28, 29). Azari et al. (2023) had accordingly found that time management teaching in the biology course had brought similar effects on the female and male students' CASES scores (30). Based on Bandura's theory of self-efficacy, the pure learning experience in students could be positively associated with enhanced self-efficacy in the monitored group. Such an experience could thus happen when both students and teachers could be directly involved in the learning process. During a CL classroom, the students would stop when something was ambiguous and follow clear explanations from their teacher (31). Moreover, Chan and colleagues (2016) had pointed to higher levels of curiosity and attention to increased responsiveness in the LMS (29). Therefore, newly designed learning strategies could introduce more reliable and appropriate answers to students' educational empowerment. This should be noticed more in male students than females.

Despite the statistically insignificant effectiveness of integrating the online and LBT approaches regarding self-efficacy behavior, only

an increase in the students' academic self-efficacy was found. Consistently, Männistö and colleagues (2020) demonstrated that participatory online learning could enhance interaction, cooperation, problem-solving skills, learning satisfaction, and motivation in nursing students (16). Nevertheless, the participants in other studies affirmed that computer-based training could be frustrating at times because gathering information discussed during online seminars could be difficult and stressful, thereby reducing the flexibility of this teaching method (29). Akçayır and Akçayır (2018) further reported that students had failed to receive proper assistance in the absence of face-to-face settings. Moreover, some studies have shown no significant difference in classroom skills (32) and academic self-efficacy among students using the LBT and EL materials (33). The reason might be the practical skills in the nursing environments, which do not easily improve during qualitative methods. According to the principles in Bandura's theory of self-efficacy, it was suggested that more flexible forms of the BL approaches such as improving the content, giving effective reciprocal feedback, and having more participation in learning should be provided to influence both theoretical and practical aspects in the monitored student groups.

As a result, there was a statistical difference in the students' academic self-efficacy in combined EL between CL and LBT approaches. In line with the study findings, a meta-analysis further established that the positive effects of both BL methods were preferable among the nursing students although this method could significantly enhance the levels of knowledge and satisfaction among them without a significant difference in their skills (32). However, online and in-class learning might not affect academic achievement in undergraduate students (34). In part, online education may not be able to fully replace some offline learning experiences, such as interactive knowledge-building between teachers and students. For example, it has been validated that the scores of medical students showing more interest in the online education model have been significantly higher than those with less interest and interaction with peers (35). Furthermore, according to a recent study, students could feel more efficient and independent due to gaining interactive peer and teaching experience in CL classrooms (36). Attending classroom on time, aspiring to start the tasks, and asking questions for further clarification when in doubt were some examples of students' autonomy (35). Of note, the possible reasons for these differences were the extravagant combination of two methods with ascertained learning objectives, preparation of appropriate course materials by teachers, well-designed group discussions, and self-directed learning strategies by enthusiastic students. Thus, the effects of BL methods on academic skills should be further investigated with a large sample size in various courses.

The present study had some limitations. It was conducted for the first time with a quasi-experimental design without a control group, on undergraduate nursing students in a small region in Iran. To generalize the findings to other academic levels, it was initially advised to carry out replication study with a larger sample size of different academic groups in a more precise fashion. Indeed, the availability of other educational sources to nursing students based on their groups was the second limitation. To deal with this issue, the selected nursing students were recommended to share their questions with the researchers and other students via social media platforms through messages, simultaneous conversations in the LMS chat rooms, or emails. There was also much attempt to provide content from the most updated and reliable sources to cover all the educational needs of the students enrolled in the PNCC, so they were not driven to refer to other educational sources. Given the possibility of students' fatigue during the teaching process, at least 10-minute breaks were considered. Finally, it is recommended that further studies should be performed with a larger sample size in control and intervention groups, using other educational content such as films, audio files, and animations along with combining EL, lectures, etc.

Conclusion

Based on the study findings, integrating the EL and CL approaches rather than blended online and in-class learning could sufficiently be effective for enhancing academic self-efficacy, regardless of the outcomes of the statistical analyses. However, there was a statistically significant increase in the CASES variables among the undergraduate nursing students upon integrating the CL and EL methods. It has been acknowledged that EL has its own advantages for enhancing the students' learning in both intervention groups, so new learning strategies should be considered as a potential teaching method in nursing education. As to guaranteeing the effectiveness of BL, the design principles of online learning materials, learning goals, as well as students' preferences and characteristics should be rigorously evaluated.

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Authors' Contributions

All authors contributed to the discussion, read and approved the manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated resolved.

Conflict of Interest

The authors declare no conflicts of interest.

References

1. Sheikhaboumasoudi R, Bagheri M, Hosseini SA, Ashouri E, Elahi N. Improving nursing students' learning outcomes in fundamentals of nursing course through combination of traditional and e-learning methods. Iran J Nurs Midwifery Res. 2018;23(3):217.

2. Sáiz-Manzanares MC, Escolar-Llamazares MC, Arnaiz González Á. Effectiveness of blended learning in nursing education. Int J Environ Res Public Health. 2020;17(5):1589.

3. Du L, Zhao L, Xu T, Wang Y, Zu W, Huang X, et al. Blended learning vs traditional teaching: The potential of a novel teaching strategy in nursing education-a systematic review and meta-analysis. Nurse Education in Practice. 2022;63:103354.

4. Anthony B, Kamaludin A, Romli A, Raffei AFM, Nincarean A, L Eh Phon D, et al. Exploring the role of blended learning for teaching and learning effectiveness in institutions of higher learning: An empirical investigation. Educ Inf Technol. 2019;24(6):3433-66.

5. Rhode J, Richter S, Gowen P, Miller T, Wills C. Understanding faculty use of the learning management system. Online Learn. 2017;21(3):68-86.

6. Chen CK, Almunawar MN. Cloud learning management system in higher education, Opening Up Education for Inclusivity Across Digital Economies and Societies. USA: IGI Global; 2019. pp. 29-51.

7. Chung JYS, Li WHC, Cheung AT, Ho LLK, Chung JOK. Efficacy of a blended learning programme in enhancing the communication skill competence and self-efficacy of nursing students in conducting clinical handovers: a randomised controlled trial. BMC Med Educ. 2022;22(1):1-10.

8. Prasad P, Maag A, Redestowicz M, Hoe LS. Unfamiliar technology: Reaction of international students to blended learning. Comput Educ. 2018;122:92-103.

9. Broadbent J. Comparing online and blended learner's self-regulated learning strategies and academic performance. Internet High Educ. 2017;33:24-32.

10. Medina LC. Blended learning: Deficits and prospects in higher education. Australas J Educ Technol. 2018;34(1):1.

11. Regmi K, Jones L. A systematic review of the factors–enablers and barriers–affecting e-learning in health sciences education. BMC Med Educ. 2020;20(1):1-18.

12. Ghavifekr S. Collaborative learning: a key to enhance students' social interaction skills. MOJES Malaysian Online J Educ Sci. 2020;8(4):9-21.

13. Nhan H, Nhan TA. Different grouping strategies for cooperative learning in english majored seniors and juniors at can tho university, vietnam. Educ Sci. 2019;9(1):59.

14. Zhang J, Cui Q. Collaborative learning in higher nursing education: A systematic review. Journal of professional nursing. 2018;34(5):378-88.

15. Indriwati SE, Susilo H, Hermawan IMS. Improving students' motivation and collaborative skills through Remap Jigsaw learning combined with modelling activities. JPBI. 2019;5(2):177-84.

16. Männistö M, Mikkonen K, Kuivila HM, Virtanen M, Kyngäs H, Kääriäinen M. Digital collaborative learning in nursing education: a systematic review. Scand J Caring Sci. 2020;34(2):280-92.

17. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Adv Behav Res Ther. 1978;1(4):139-61.

18. Prifti R. Self–efficacy and student satisfaction in the context of blended learning courses. Open Learning. 2022;37(2):111-25.

19. Haverback HR. Middle Level Teachers Quarantine, Teach, and Increase Self-Efficacy Beliefs: Using Theory to Build Practice during COVID-19. Middle Grades Review. 2020;6(2):n2.

20. Peechapol C, Na-Songkhla J, Sujiva S, Luangsodsai A. An Exploration of Factors Influencing Self-Efficacy in Online Learning: A Systematic Review. Int J Emerg Technol Learn. 2018;13(9):64-86.

21. Taber S, Akdemir N, Gorman L, van Zanten M, Frank JR. A "fit for purpose" framework for medical education accreditation system design. BMC medical education. 2020;20:1-12.

22. Ashoori J, Kajbaf MB, Manshaee GR, Talebi H. Comparison of the Effectiveness of Web-Based, Cooperative Learning and Traditional Teaching Methods in Achievement Motivation and Academic Achievement in the Biology Course. Interdisciplinary J Virtu Learn in Med Sci. 2014;5(2):25-34.

23. Moradi Doliskani M, Yonespor Eisaloo Z, Moradi R. The effect of Flipped Classroom method on academic self-efficacy and selfdirected learning of students in English language course. Educational Strategies. 2022;15(1):10-8.

24. Hockenberry MJ, Wilson D. Wong's nursing care of infants and children-E-book. USA: Elsevier Health Sciences; 2018.

25. Shokri O, Toulabi S, Ghanaei Z, Taghvaeinia A, Kakabaraei K, Fouladvand K. A psychometric study of the academic self-efficacy beliefs questionnaire. Studies in Learning & Instruction. 2012;3(2):11-6.

26. Bradley RL, Browne BL, Kelley HM. Examining the influence of self-efficacy and self-regulation in online learning. Coll Stud J. 2017;51(4):518-30.

27. Fernandez-Rio J, Cecchini JA, Méndez-Gimenez A, Mendez-Alonso D, Prieto JA. Self-regulation, cooperative learning, and academic self-efficacy: Interactions to prevent school failure. Front Psychol. 2017;8:22.

28. Forouzi MA, Alizadeh SM, Heidarzadeh A. Viewpoints

of nursing and midwifery students toward desirability of collaborative learning in the English language course 3. JNE. 2016;5(5):37-42.

29. Chan AWK, Sit JWH, Wong EML, Lee DTF, Fung OWM. Case-based web learning versus face-to-face learning: a mixed-method study on University nursing students. J Nurs Res. 2016;24(1):31-40.

30. Saman Azari J, Livarjani Sh, Azmoodeh M. Comparing the effectiveness of teaching study methods and time management on academic self-efficacy and academic self-regulation and biology course performance of 12th grade experimental sciences male and female students. Journal of Adolescent and Youth Psychological Studies. 2023;4(10):139-54.

31. Jackson CB, Quetsch LB, Brabson LA, Herschell AD. Web-based training methods for behavioral health providers: A systematic review. Adm Policy Ment Heal Ment Heal Serv Res. 2018;45(4):587-610.

32. Li C, He J, Yuan C, Chen B, Sun Z. The effects of blended learning on knowledge, skills, and satisfaction in nursing students: A meta-analysis. Nurse Educ Today. 2019;82:51-7.

33. Zwart DP, Noroozi O, Van Luit JE, Goei SL, Nieuwenhuis A. Effects of Digital Learning Materials on nursing students' mathematics learning, self-efficacy, and task value in vocational education. Nurse Educ Pract. 2020;44:102755.

34. Cimermanová I. The Effect of Learning Styles on Academic Achievement in Different Forms of Teaching. Int J Instr. 2018;11(3):219-32.

35. Bączek M, Zagańczyk-Bączek M, Szpringer M, Jaroszyński A, Wożakowska-Kapłon B. Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students. Med. 2021;100(7):e24821.

36. Yates A, Starkey L, Egerton B, Flueggen F. High school students' experience of online learning during Covid-19: the influence of technology and pedagogy. Tech Peda Edu. 2021;30(1):59-73.