

ORIGINAL RESEARCH

Exploring e-learning among nurse educators in undergraduate nursing

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Abstract

Background: Nurse educators' use blended learning pedagogy to support student centered learning in undergraduate curriculum. E-learning technology has been used to engage students in conceptual and experiential opportunities in higher education.

Objective: The objective of the study was to explore the perceptions of use and satisfaction of e-learning (Moodle) among nurse educators in an undergraduate nursing curriculum.

Methods: A cross-sectional research design was used among 50 nurse educators in undergraduate nursing in February 2010. Ethical approval was sought from the College ethics committee. A validated and reliable self-administered Faculty Satisfaction Survey was used to collect data. Inferential statistics was used to analyze the data.

Results: Nurse educator's perceptions were divergent, acknowledging the benefits of moodle, while some of them expressed concerns regarding over-time, limited resources, increased workload, and poor technical support. Some of the nurse educators exhibited positive attitudes towards the pedagogical value of moodle in engaging students, while some lacked the confidence to embark on developing courses using moodle.

Conclusion: The study showed a rising awareness of the use of e-learning among nurse educators and moderate satisfaction as a blending learning approach.

Implication: Nurse educators may need to incorporate moodle in the teaching-learning at a self-directed pace, using flexibility and convenience for higher learning approaches.

Key words

E-learning, Online learning, Blended learning, Information technology, Moodle, Mobile learning, Satisfaction, Nurse educators, Undergraduate curriculum

1 Introduction

There is a rapid growth in information communication technology with an increased focus on innovative educational delivery methods. As the use of e-technology becomes more popular, its consequences on learning outcomes in nursing

should be considered. Nurse educators have recognized the need to integrate e-learning technology into nursing education ^[1]. E-learning is endorsed as a tool for developing the 21st century skills among nurses required to function effectively in the knowledge economy ^[2, 3]. Nurse educators are increasingly using computer-assisted learning to enhance educational delivery ^[4, 5] and integrate blended learning into teaching-learning processes ^[6]. This provides consistency of educational delivery ^[7], reduces instruction time ^[8], enhances effectiveness and mastery of learning, improves retention ^[9] and increases student motivation ^[10], satisfaction ^[11] and enjoyment in learning ^[12].

E-learning is an innovative approach for delivering well-designed, learner-centered, interactive, and facilitated learning environment ^[13]. Incorporation of critical thinking and communication strategies in e-learning positively impacts on student satisfaction in a web-based course ^[14]. A continual interaction using e-learning between undergraduate nursing students and nurse educators enhances student satisfaction and enriches their learning. Web-based learning among graduate students' reported significantly higher stimulation in learning than the conventional lecture group ^[15]. Students' gained significant satisfaction with the multimedia delivery of courses ^[16]. E-learning strategies enable students to be independent, have a self-directed learning and self-discipline ^[17]. Hence expertise of nurse educators in use of e-learning is significant for student satisfaction and depth of learning ^[18].

1.1 Background

There is an increasing rate of web and online usage within all sectors, especially younger Arab students and nurse educators ^[19]. The implementation of WebCT at an Omani public university found that 3000 student users revealed that they favored the use of moodle in learning and faculty insisted on increased time in developing these courses ^[20]. Web-assisted instruction was found to be more effective than face-to-face instruction in terms of student achievement and positive attitudes ^[21]. Web-enhancement in nursing creates flexibility and enhances critical thinking through learning experiences and reflective activity ^[22]. There is a dearth of studies regarding nurse educator's perspectives related to use of e-learning in the nursing curriculum.

The BSN nursing education is the first in the Sultanate of Oman with multi-cultural faculty. Within this BSN curriculum, the use of 'e-learning' as a blended learning strategy is a new concept among nurse educators in the Middle East. There is a paradigm shift from teaching to learning in this school of nursing. Exploring the factors that positively shape e-learning will assist nurse educators to increasingly use e-learning technology. Hence, this study explores the use and satisfaction of e-learning among nurse educators in the undergraduate nursing curriculum. The findings have relevance to nurse educators as lifelong learning and are essential to maintain knowledge, practice and professional competency in Oman.

1.2 Conceptual framework

The Instructivist learning teacher-centered model (Moule *et al.*) was adopted for the study ^[23]. This e-learning model describes technology-enhanced learning that spans instructivist to constructivist approaches (see Figure 1). In our study instructivist learning theory (teacher centered) model of learning suggests knowledge exists independently of learner. The constructivist theory (student focused) describes the student who constructs new knowledge through analysis of information and reference to experience and understanding. The e-learning ladder base identifies applications that give access to instructional material. The ladder presents a range of technologies that exist with the potential to enhance learning and a number of factors that impact on their adoption and use. The effective use of e-learning depends on the levels of computer literacy, academic background, nursing culture and social networks to adopt e-learning among nurse educators.

1.3 Study aim

The aim of the study was to explore the use of e-learning and satisfaction using moodle (e-learning) for teaching-learning among nurse educators in undergraduate curriculum in the Middle east.

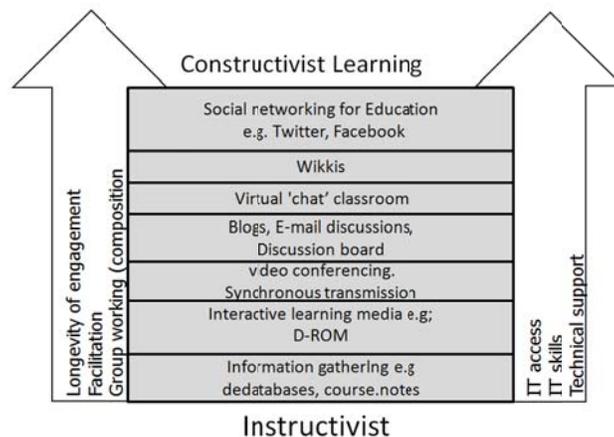


Figure 1. Instructivist learning- teacher centered model among nurse educators

2 Methods

2.1 Study design

The study used a cross-sectional research design to explore the perceptions regarding use and satisfaction of e-learning among nurse educators in the undergraduate nursing curriculum.

2.2 Sample size, setting and participants

Sample size was determined using G*Power software using chi-square for goodness of fit test, and contingency table [24]. The sample size was calculated at a power of 95% using 5% level of significance with a medium effect size of 0.3 with alpha 5%. Hence the sample size required was 50 nurse educators. The total number of nurse educators available in the school of nursing in a public university was 50. All these nurse educators were included in the study in January 2010.

2.3 Human ethics

Ethical approval was obtained from the College Research Committee, Sultan Qaboos University in January 2010. After obtaining ethical permission, 50 nurse educators were recruited, informed and provided written information regarding the study. It outlined that participation was entirely voluntary, that they could withdraw at any time. Extreme care was taken to adhere to human and ethical principles.

2.4 Data collection

The nurse educators were provided a covering letter to describe the purpose, instructions, informed consent and data collection instruments. Written and verbal consent was obtained among those who volunteered to participate in the study. It was emphasized that the aim of the study was purely to elicit perceptions of nurse educators. Confidentiality and anonymity would be maintained. The participants who voluntarily participated in the study completed the questionnaires, placed it in a sealed envelope and returned them to the investigators. All the data were locked and treated confidentially. The data was double checked, entered and coded in the SPSS 20 version.

2.5 Development of study instruments

An extensive literature was conducted regarding use and satisfaction of web and e-learning among nurse educators to develop the data collection instruments [25, 26]. The data collection instruments were:

- Teaching-learning with technology tool (TLT) was used to assess teaching activities or communication used in the moodle course (12 items), priorities and importance of moodle (8 items). It had a combined 3-point rating

scale from always, frequently and never and a checklist with very important and not important. E.g. sound clips in class room, websites as extra resources, quizzes online, discussion forums, enhancing class room teaching, teacher-student communication, practice learning, assessment.

- Teaching-learning readiness tool (TLR) assessed the factors related to nurse educator's (14 items) and student's readiness (6 items) in using moodle. E.g. support and guidance, time, training, development.
- Faculty satisfaction survey (FSS) developed by Bolliger and Wasilik^[26] was used to assess satisfaction at the level of student, faculty and institution using a 4-point Likert scale ranging from strongly disagrees to strongly agree. It had 28 items with three subdomains related to student (15 items), faculty (9 items) and institution (4 items).E.g. level of interactions with students in moodle course, actively involved in learning, few resources when teaching, access course anytime at convenience.
- Demographic tool had 8 items consisting of age, gender, experience, qualification, number of students, number of courses, and satisfaction.

2.6 Validity and reliability

The data collection instruments were validated by an educational designer, informatics specialist and a nurse educator. These tools were found to be valid. Internal consistency reliability was assessed with Cronbach's alpha coefficient. The internal reliability for the TLT, TLR and FSS instruments was 0.71, 0.73 and 0.86 respectively.

3 Results

3.1 Demographic characteristics (see Table 1)

Half percentage of the nurse educators were above 40 years (54%) and had more than 15 year experience (44%). Majority of them were female (88%) and had postgraduate education (82%). Some of the nurse educators have used moodle in less than 5 (82%). Some of them reported satisfaction using moodle as blended learning approach (88%).

Table 1. Demographic characteristics among nurse educators (N=50)

	Demographic characteristics	Category	F	P (%)
1	Age (years)	< 40	23.00	46.00
		> 40	27.00	54.00
2	Gender	Female	44.00	88.00
		Male	6.00	12.00
3	Total experience (years)	< 10	14.00	28.00
		10-15	14.00	28.00
		> 15	22.00	44.00
4	Qualification (Nursing)	Baccalaureate/Masters	41.00	82.00
		Doctorate	9.00	18.00
5	Number of students in a course	< 25	19.00	38.00
		25-50	14.00	28.00
		> 50	17.00	34.00
6	Number of courses using moodle	< 5	41.00	82.00
		5 - 15	9.00	18.00
7	Satisfaction using moodle	Outstanding	3.00	6.00
		Good	44.00	88.00
		Average	3.00	6.00

3.2 Teaching-learning with technology among nurse educators (see Table 2)

Nurse educators commonly reported use of the moodle in teaching and communicating activities. They 'always' reported using quiz and tests (80%), virtual world sites (90%) and chats/forums/blogs (86%). They also expressed use of moodle for assessment (78%), records online (72%) and social networking site (72%) while teaching.

3.3 Priorities in moodle among nurse educators (see Table 2)

Nurse educators prioritized various areas for developing, implementing and delivery of moodle. Some of them reported diversity and accessibility in learning (62%), online assessment (46%) and technical knowledge and support (40%) as quiet important.

Table 2. Teaching-learning with technology and Priorities among nurse educators (N = 50)

Teaching-learning with technology		Always	%	Frequently	Never	%
1	Communicate	17.00	34.00	13.00	26.00	40.00
2	Powerpoint, film, sound clips, lectures	20.00	40.00	15.00	30.00	6.00
3	Suggest websites	5.00	10.00	17.00	34.00	40.00
4	Quizzes and tests online	40.00	80.00	8.00	16.00	4.00
5	Assessments online	39.00	78.00	10.00	20.00	2.00
6	Records online	36.00	72.00	14.00	28.00	0.00
7	Online simulations	26.00	52.00	16.00	32.00	16.00
8	Mobile phones, ipad, ipod, smart TV	8.00	16.00	21.00	42.00	8.00
9	Social networking sites	36.00	72.00	4.00	8.00	8.00
10	Virtual world site	45.00	90.00	3.00	6.00	4.00
11	Discussion forums	19.00	38.00	6.00	12.00	26.00
12	Chats/ forums, blogs	43.00	86.00	6.00	12.00	2.00

Priorities in moodle		Quite important	%	Not important	%
1	Classroom teaching	10.00	20.00	40.00	80.00
2	Teacher–student, peer communication	14.00	28.00	36.00	72.00
3	Practice skills learning	11.00	22.00	15.00	30.00
4	Online assessments, exercises	23.00	46.00	20.00	40.00
5	Technical support	20.00	40.00	12.00	24.00
6	Independent, interprofessional learning	10.00	20.00	15.00	30.00
7	Diversity and accessibility	31.00	62.00	19.00	38.00
8	Family-friendly modules, improve retention	5.00	10.00	19.00	38.00

3.4 Teaching-learning readiness among nurse educators (see Table 3)

Some nurse educators reported administrative decision-making (48%) and self-perceived negativism (62%) related to readiness to use of moodle. They also reported use of electronic course content (34%), quality of teaching (22%), staff development (32%), workload (36%) and new teaching challenges (30%) as related factors.

3.5 Faculty satisfaction among nurse educators (see Table 4)

Less than half of the nurse educators strongly agreed with the access to moodle courses at any time (48%) and lacked face-to-face contact with students (36%). While some of the nurse educators agreed with the active involvement in learning (30%), students access moodle at any place (22%), opportunity to reach students (22%) and level of teacher-student interaction (20%). Few nurse educators strongly agreed that few resources (16%), frustration with technicality (18%) and wider range of resources (18%). Some faculty agreed that they were satisfied with teaching (54%) and use of moodle regardless of technical concerns (22%). 30% of the nurse educators strongly agreed that they were satisfied with workload, preparation and course evaluations.

Table 3. Teaching-learning readiness among nurse educators (N = 50)

Faculty related readiness		All the times	%	Sometimes	%
1	Reliable network, equipment, office rooms	7.00	14.00	43.00	86.00
2	Electronic course content	17.00	34.00	33.00	66.00
3	Support and guidance, need to change	3.00	6.00	8.00	16.00
4	Time to prepare, confidence, motivation, background in computers	4.00	8.00	9.00	18.00
5	Student IT skills	5.00	10.00	14.00	28.00
6	Physical health, enthusiasm, positive perception	8.00	16.00	42.00	84.00
7	E-learning available, Course management, evaluation	7.00	14.00	9.00	18.00
8	Quality of teaching at university	11.00	22.00	39.00	78.00
9	Staff development, tech, IT training,	16.00	32.00	33.00	66.00
10	Workload	18.00	36.00	32.00	64.00
11	University/ College decision-making	24.00	48.00	26.00	52.00
12	Basic, more advanced features, funds	2.00	4.00	27.00	54.00
13	Negative perceptions	31.00	62.00	19.00	38.00
14	Particular students or courses, new teaching challenge	15.00	30.00	35.00	70.00
Students related readiness		All the times	%	Sometimes	%
1	Age, gender	44.00	88.00	6.00	12.00
2	Physical ability	36.00	72.00	14.00	28.00
3	Previous level of attainment, learning experience	17.00	34.00	33.00	66.00
4	Positive or negative attitude towards the technology	9.00	18.00	41.00	82.00
5	Expectations, commitment and application	6.00	12.00	44.00	88.00
6	Response to and experience of previous/ recent learning, perceptions, Existing competence/familiarity in the use of technology	5.00	10.00	22.50	45.00

Table 4. Faculty satisfaction using Moodle among nurse educators (N = 50)

No	Satisfaction with moodle	Strongly agree F	P (%)	Agree F	P (%)	Disagree F	P (%)	Strongly disagree F	P (%)
S1	Level of teacher-student interactions		0.00	10.00	20.00	24.00	48.00	16.00	32.00
S2	Flexibility		0.00	4.00	8.00	19.00	38.00	27.00	54.00
S3	Actively involved in their learning.		0.00	15.00	30.00	23.00	46.00	12.00	24.00
S7	Miss face-to-face contact with students	18.00	36.00	1.00	2.00	10.00	20.00	21.00	42.00
S10	Students are very active in communicating		0.00	8.00	16.00	29.00	58.00	13.00	26.00
S11	Access my e-learning course any time at my convenience.	24.00	48.00	1.00	2.00	7.00	14.00	18.00	36.00
S12	Students are more enthusiastic about their learning than their traditional counterparts.		0.00	5.00	10.00	28.00	56.00	17.00	34.00
S16	Satisfied with the use of communication tools		0.00	5.00	10.00	17.00	34.00	28.00	56.00
S17	Better feedback to my e-learning students on their performance in the course.		0.00	4.00	8.00	16.00	32.00	30.00	60.00
S19	Students are somewhat passive to contacting the instructor	3.00	6.00	1.00	2.00	17.00	34.00	29.00	58.00
S20	Students can access my e-learning course from any place in the world.		0.00	11.00	22.00	19.00	38.00	20.00	40.00
S21	Participation level of my students in the class discussions is lower		0.00	2.00	4.00	38.00	76.00	10.00	20.00

(Table 4 continued on page 79)

Table 4. (Continued.)

No	Satisfaction with moodle	Strongly agree F	P (%)	Agree F	P (%)	Disagree F	P (%)	Strongly disagree F	P (%)
S25	Not meeting my e-learning students face-to-face	4.00	8.00	3.00	6.00	14.00	28.00	29.00	58.00
S27	Gratifying because it provides me with an opportunity to reach students		0.00	11.00	22.00	17.00	34.00	22.00	44.00
S28	More difficult for me to motivate my students	9.00	18.00	1.00	2.00	3.00	6.00	37.00	74.00
	Mean	3.90	7.80	5.47	10.93	18.73	37.47	21.93	43.87
	Standard deviation	9.13	14.94	4.49	8.97	8.90	17.80	7.81	15.63
F4	Fewer resources	8.00	16.00	6.00	12.00	20.00	40.00	16.00	32.00
F5	Technology is reliable.		0.00	6.00	12.00	29.00	58.00	15.00	30.00
F8	Not problems controlling my students		0.00	6.00	10.20	36.00	73.47	8.00	16.33
F9	Look forward to teaching my next e-learning course.		0.00	6.00	12.00	28.00	56.00	16.00	32.00
F13	More creative resources used for the e-learning course.		0.00	7.00	14.00	20.00	40.00	23.00	46.00
F14	Frustrating because of technical problems.	9.00	18.00	7.00	14.00	15.00	30.00	19.00	38.00
F18	More satisfied with teaching		0.00	27.00	54.00	18.00	36.00	5.00	10.00
F22	Students use a wider range of resources in the e-learning	9.00	18.00	10.00	20.00	1.00	2.00	30.00	60.00
F23	Technical problems do not discourage me.		0.00	11.00	22.00	34.00	68.00	5.00	10.00
	Mean	2.89	5.78	9.56	19.11	22.33	44.67	15.22	30.44
	Standard deviation	0.58	8.69	6.80	13.74	10.83	21.89	8.33	16.63
I6	Higher workload	15.00	30.00	1.00	2.00	13.00	26.00	21.00	42.00
I15	Takes me longer to prepare for an e-learning course on a weekly basis	15.00	30.00	1.00	2.00	16.00	32.00	18.00	36.00
I24	Fair compensation for e-learning teaching.	2.00	4.08	20.00	38.78	17.00	34.69	11.00	22.45
I26	Receiving lower course evaluations	15.00	30.00	11.00	22.00	5.00	10.00	19.00	38.00
	Mean	11.75	23.50	8.25	16.50	12.75	25.50	17.25	34.50
	Standard deviation	6.50	14.45	9.14	17.76	5.44	11.06	4.35	8.48

Note. Subscales: Student – S, Faculty – F and Institute – I, F-Frequency, Percentage- %

3.6 Faculty satisfaction and demographic characteristics (see Table 5)

Age, qualification, number of students, number of courses using moodle and satisfaction using moodle was found to be significant with faculty satisfaction at 5% level of significance.

Table 5. Association between faculty satisfaction and demographic characteristics using Pearson Chi square (λ)

Demographic characteristics	λ value	p
Age	11.868	0.04*
Gender	15.589	0.75
Experience	22.764	0.62
Qualification	15.290	0.05*
Number of students in a course	9.791	0.02*
Number of courses using Moodle	7.217	0.09**
Satisfaction using moodle	11.086	0.01*

* $p < .05$ level of significance, ** $p < .10$ level of significance

4 Discussion

In our study nurse educators reported use of e-learning (moodle) in courses using quiz, notes/powerpoints, videos, networking, and chats/forums/blogs. This enhances communication in teaching, exchange of information with students, and accessibility to moodle facilitates learning. The students had an opportunity to interact with teachers and peers and perceived connection in the learning process [27, 28]. Powerpoints for tutorials, communicating with students via email, suggesting websites as extra resources, online simulation exercises, posting lecture notes on course websites, using film clips or sound clips were considered useful for teaching [25, 29]. Qualified nurses engaged in post-registration courses have shown improved clinical practice as a result of e-learning and improved clinical decision-making using e-learning/moodle. Online student records and assessment, videoconferencing and social networking sites were reported by fewer staff was 'advanced' computer users [25].

Nurse educators in our study used moodle for active learning, participation and communication with students. They reported enhanced classroom teaching and teacher–student relationship and student–student communication more important than assessment and e-learning [25]. The importance of developing 'learning centered' courses as opposed to 'content-centered courses' [30] ensures that students are engaged and learning rather than just focusing on presentation of material. If good pedagogic practice is incorporated into e-learning materials, then higher-order learning may take place [23, 31]. Students engage in an interactive communication with teacher and peer which encourages intellectual challenge and interest [32, 33]. Hence use of moodle increases teacher-student contact time and improves the quality of the learning experience by addressing diverse student needs.

Nurse educators in our study reported developing moodle course content, guidance, networking and information technology skills that influenced their readiness and satisfaction using moodle. Lack of confidence, time and work load, technical support, hinders readiness to use e-learning. Student's previous experience, motivation and commitment to group learning experience in higher levels affect their readiness to use e-learning. Nurse educator expressed concerns about the development and delivery of good quality resources for e-learning as time intensive, need for expertise and increasing work-load [34, 35]. Easy access to web-based learning courses by students was experienced by registered nurses'. Some nursing students were motivated to engage in self-directed and independent learning [36]. Nurse educators use case scenarios, flexibility and peer communication, support, knowledge validation in e-learning approaches [37]. Interactivity, practice exercises, repetition and feedback improved learning outcomes [38].

In our study nurse educators were concerned with student's high expectations using moodle, need for higher range of e-learning resources, technical support, time management and course evaluations. They build competencies in use of moodle incorporating information technology in teaching and monitor patterns of students access to moodle and track records. They reported increased workload and preparation time and development using moodle. Instructors using e-learning invest more time than teaching face-to-face [39-41] and need to maintain competencies [42]. Although they consider e-learning is an effective mode of delivery enhancing teaching-learning [43, 44]. Age, qualification, number of students, number of courses using moodle and satisfaction using moodle was found to be significant with faculty satisfaction. They experienced a range of e-learning resources as an adjunct to didactic mode of delivery and learning experiences. Faculty, student and institution satisfaction are important as they influence motivation using e-technology in effective learning and sustainability [26].

5 Conclusion

The findings of the study highlight the factors influencing e-learning as a blended learning approach to engage students in the learning process. These nurse educators reported flexibility, support and effective communication through stimulating, reflective, interactive and engaging learning strategies. E-learning environments with student engagement and improve learning experiences may be significant to learning outcomes [45] and support face-to-face delivery [23]. This encourages

student-teacher interaction for active learning, reciprocity and cooperation. Use of e-learning helps to develop higher analytical skills through review and discussion of case studies, evidence based practice, culture of safety and ongoing feedback. However, some proportion of nurse educators identified concerns related to over-time preparation in development and implementation, adequate resources in delivery and technical support as priority to develop courses incorporating moodle. Faculty satisfaction can affect motivation and commitment, as it is time consuming and demanding ^[46, 47] which is one of the five pillars of quality outcomes like student satisfaction, learning effectiveness, access and institutional cost-effectiveness ^[47]. E-learning will be integrated extensively within nursing curriculums with reconceptualization of the student learning process. It can be efficient and improve the quality of education in a cost effective way ^[48, 49]. Expansion of e-learning to support constructivist approaches may help to respond to diversity in student learning needs. They need to be adaptable to preference style of learning and self-directed use of nurse educators to enhance integration of theory to practice. This creates transparency in the teaching-learning process and opportunities for student-teacher interaction and student engagement. Hence e-learning is integral for commitment to lifelong learning among nurse educators.

6 Implications for practice and education

There is a need for open door policy for use of e-learning with restricted user name and password protection and security to access to review the learning management system. Clinical applications of continuing competencies and confidence in clinical practice and education will be increased with access and use of moodle via mobile learning like smart phones and ipads. Nurse educators can develop learning centered courses based on the e-learning model of higher learning resources and applications. Finks' theoretical principles of significant learning like knowledge, application, integration, human dimension, caring, learning how to learn can be used to develop higher thinking and clinical reasoning. Linking these elements creates a paradigm shift to constructivist learning. E-learning can be applied to clinical, laboratory and class room teaching through the use of computer and technology software in which students engage in virtual campus and simulated scenarios. Specific arrangements should be made for technical support personnel to assist nurse educators with hardware and software difficulties. Telephone and on-site consultation service might reduce anxiety and unexpected concerns. As e-learning is known as a 'revolution in education' ^[50], stringent institutional policies and professional development opportunities ^[51, 52] will help to enhance e-learning applications in undergraduate nursing curriculum.

7 Limitations

This study refers to use of moodle (e-learning) in teaching, and cannot assume that the results apply equally to other e-learning environments. The sample size was small so the findings can be generalized to homogenous situations.

Highlights

- 1) Integration of e-learning in teaching-learning process creates flexibility and enhances learning experiences.
- 2) Increased need for time management, allocation of resources and technical support among nurse educators.
- 3) Moderate satisfaction of e-learning as a blended learning approach for student learning and expected achievement.

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