Original Research Article

E-learning and general weighted average as predictors for nurses licensure examination

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This study evaluated the relationship of E-learning and the General Weighted Average (GWA) of students with the Nursing Licensure Exam (NLE). A descriptive-correlational design was used to describe E- learning, GWA and results of the licensure examination of graduates. 1,257 nursing graduates from the School of Nursing from the three campuses in Manila were purposively selected as the subjects of the study. Mean and SD was used to describe E-Learning, GWA and NLE performances of graduates. Pearson's correlation and multiple regression analysis were used to determine the relationship among E- Learning, GWA and NLE performance. E-learning performances of graduates were conditional pass category while GWA and NLE performances were satisfactory. E-learning and GWA performances of graduates were correlated with NLE performances for graduates who took the June and July NLE. However, there was weak correlation in the performance of graduates who took the December NLE. E-Learning and GWA were all predictors in nursing graduates. The two predictor model was able to account for 51 to 61% variance in NLE performances of graduates. The study concludes that E-Learning and GWA performances of graduates are bases for passing the Nurses Licensure Examination (NLE).

Key words: E Learning, general weighted average, nurses licensure examination

INTRODUCTION

The declining results of the recent nursing board passers have alarmed school administrators to look into the quality of learning offered to students. Even the Higher Commission on Education mandated all schools to give the best education and training schools they could offer as there is an increase of demand for nurses in the Philippines and abroad. According to Mgbekem and Akpan (2007), nursing education is an important activity that demands a thorough and objective evaluation of its processes and product. Nurses need to be knowledgeable, resourceful and able to work well with other health care practitioners as supported by Valanis (2000) who cited that nurses need additional proficiencies like skills, knowledge and attitude to perform effectively. Nursing students are required to have the necessary knowledge to pass the licensure exam

and this could be achieved through effective training and education which the university must offer. Various studies have been conducted on nursing quality but the emphasis is on nursing care therefore disregarding other features and components (Mamauag and Magno, 2005). With the poor results in the recent nursing board examination from many schools, the Commission on Higher Education has identified several ways of maintaining effective and quality nursing education. Schools with passing rates below the national standards have been warned by the Commission on Higher Education. It requires school administrators to know immediate ways of determining the performance of their students in the licensure examination and to identify the course of action. E-learning was introduced in the School Year 2010 to provide new learning experience as part of the

nursing professional subject: Nursing Enhancement Seminar (NES). NES was offered in the Second Semester of Curriculum Year 2007-2008, 2008-2009 for Level IV students. E-learning had a total of 90 hours for the entire semester. E-learning aims to take advantage of the modular approach in learning aided by technology to prepare Level IV students for the Nurse Licensure Examination. E-learning allowed the students to review essential nursing concepts while engaging in highly stimulating lectures and discussions, videos and clinical simulations. Begg et al .(2007) asserts that E-learning can contribute to healthcare professionals' practice and knowledge base. Kokol et al. (2006) posits that E-learning enhances student's ability to analyze, synthesize and do critical thinking. The School of Nursing carefully selected nursing concepts for E-learning to ensure enhancement of knowledge of the students and their ability to think critically. The professional subjects in the E learning for the years 2011 and 2012 graduates include Maternal and Child Nursing (MCN) and Medical and Surgical Nursing (MS) while for graduates of 2013, it included the same subjects with the addition of Psychiatry Nursing.

For the past years, the average passing rate of the School of Nursing in the chosen campuses in Manila has been above the national passing rate. However, it is not sufficient considering the school's aim for academic excellence and global competence. This has prompted researchers to conduct a study on enhancing performances of the nursing students, as well as the techniques used by teachers. This study will contribute to the improvement of the nursing program, introduction of effective measures to identify students who are ready to take the Licensure Examination and development of appropriate plans to ensure a higher passing rate.

This study aimed to determine and understand if a relationship exists between the results of the students' E learning, General Weighted Average (GWA) and the Nursing Licensure Examination results.

Scope and Limitation

The study analyzed the scores of the students in the E-learning, GWA and the Nursing Licensure Examination and determined whether their performance in E-learning and GWA can be used as a criterion for determining students' performance in the Licensure Examination. The study included evaluation of the strengths and weaknesses of the students in the Nursing Licensure Examination as well as the strategies used by their teachers and analysis of the correlation of the performance of the students in E learning and the different subjects included in the Licensure Examination. The study did not include factors like study habit, standards, norms and others. As stated by Mamaoag and Magno (2005) based on the model on nursing quality by Valanis (2000), nurse competencies entail aspects of abilities more than affective qualities.

Significance of the study

This study may help in the evaluation of the effectiveness of the implementation of using E-learning and GWA for ensuring excellent results in the nursing licensure exam. The result may be used as an initial investigation as a predictor for passing the Philippine Nursing Licensure Examination (PNLE) and as a basis for making changes, guidelines and teaching strategies to ensure quality nursing education. The E learning used an assessment of students' readiness for the course as a criterion for evaluating students' ability to pass the Nursing Licensure Examination. Since the test evaluates a student's skills and learning preferences, it can be used to study the effect of their skills and learning preferences on students' performance in the Licensure Exam and their performance as future nurses. Results on this study may help administrators to choose the essential actions to improve performance and quality of education students must receive and have a higher passing rate in the Philippine Nursing Licensure Examination.

METHODS

Study Design

The descriptive-correlational method was used in this study to determine the relationships between E-learning, General Weighted Average (GWA), and Nursing Licensure Examination Performance of the 2011, 2012 and 2013 BSN graduates. The study will test the research hypothesis that a relationship exists among E-learning, GWA and NLE performances of graduates.

Study population

Using purposive sampling technique, the respondents of the study were nursing graduates of 2011, 2012 and 2013 academic years. This sampling technique was used because the nursing graduates have the same characteristics needed for the study. Nursing graduates followed the curriculum based on the Commission on Higher Education (CHED) memorandum order 14 or the BSN curriculum of 2009. Graduates who took the NLE for the first time were also chosen as respondents in the study.
The total population of nursing graduates was 1,257. This included 745 nursing graduates who took the 2011 NLE, 381 nursing graduates who took the 2012 NLE and 131 nursing graduates who took the 2013 NLE.

Procedure

Documents and literatures were used in obtaining answers to the problems of the study. Documents included copies of CHED Memorandum Order (CMO) CMO 14 BSN curriculum; the 2007, 2008, and 2009 BSN curricula, Transcript of

Table 1. E- Learning Performances of Graduates in Nursing Professional Subjects Comprising NLE NP1-5

E Learning Performances	2011 Graduates Mean± SD		2012 Graduates Mean± SD		2013 Graduates Mean± SD	
	July	Dec	July	Dec	June	Dec
Over all mean	131.49 ± 19.71 Conditional Pass	108.66 ± 19.87 Conditional Pass	133.06 ±21.01 Conditional Pass	118.40 ±20.57 Conditional Pass	108.87 ±15.56 Conditional Pass	104.17 ±14.77 Conditional Pass

Records with General Weighted Average (GWA) of 2011, 2012, and 2013 BSN graduates; E-Learning performances and NLE results of the nursing graduates in July and December 2011 and 2012, and June and December of 2013 from the Philippine Regulation Commission (PRC).

The General weighted average was evaluated according to the grades of the students in the nursing professional subjects according to CMO 14. E-learning performances were evaluated according to the ratings of the students in the E-learning examinations. It followed the grading system used by the chosen nursing school. The aggregated grades in the different nursing professional subjects were computed and ranked according to the grading scale. The grading scale was from Excellent (1.0) to Unsatisfactory (5.0).

The NLE performances were evaluated according to the ratings of the students in the nursing professional subjects. It followed the standard grading scale evaluation used in rating the nursing licensure examination by PRC in accordance with the Republic Act (RA) 9173. Grading scales were from Excellent (91-100) to Unsatisfactory (below 60).

Statistical analysis

Data were tabulated, analyzed and interpreted. Mean scores and Standard Deviation was utilized to describe E-learning performances, GWA, and NLE performances of BSN graduates. Pearson correlation and multiple regression analysis were used in determining the relationship among E-learning performances, GWA, and NLE performances. All statistical data were treated using Statistical Package for Social Science (SPSS) version 20. A p-value of less than 0.05 was considered statistically significant for all the analyses.

RESULTS

E-Learning performances

The E-learning performances of the nursing graduates of 2011 and 2012 ranges from 131.49 to 133.06 from 250 items examination while the nursing graduates of 2013 have an over-all mean of 108.87 from 200 items examination. The aggregated scores were ranked and interpreted as "conditional pass" according to the school passing rate of 65 % cut-off (Table 1).

General Weighted Average

The General Weighted Average (GWA) of graduates in nursing professional subjects ranges from 2.25 to 2.5 which is interpreted as "satisfactory performance". The graduates who took the July and June NLE examinations have a higher grade compared to the graduates who took the December NLE examinations (Table 2).

NLE Performances

The NLE performances of nursing graduates in June/ July and December examinations showed that graduates of 2011 who took the July 2011 NLE have high performance, with satisfactory in NP2 while graduates of 2012 and 2013 who took the July 2012 and June 2013 NLE have high performance in NP1. All nursing graduates who took the July and June NLE have low performance in NP4. The nursing graduates who took the December 2011 NLE have high performance in NP2 and low performance in NP1, nursing graduates who took the December 2012 NLE have high performance in NP1 and low performance in NP2, and nursing graduates who took the December 2013 NLE have high performance in NP5 and low performance in NP3(Table 3).

Correlation of E-Learning, GWA, and NLE Performances

E learning performances is highly correlated (.70 <.05) with NLE performances in graduates of 2011 who took the NLE in July 2011. Moderate correlation is observed between E learning and NLE performances in graduates of 2012 (.64<.05) and 2013 (.65 <.05) who took the June/ July NLE. Moreover, the relationship between E learning and NLE performances of nursing graduates who took the December 2013 NLE yielded no significant correlation(Table 4).

The GWA and NLE performances correlation results gives a high correlation results for graduates of 2012 (-.72 <.05) and 2013 (-.74 <.05) while a moderate negative correlation for graduates of 2011 (-.59 <.05) who took the June and July NLE. Furthermore, the GWA and NLE performances is high inversely correlated in graduates of 2011 (-.84<.05) and 2013 (-.73 <.05) who took the December NLE while in graduates of 2012 results showed no significant result(Table 5).

Multiple linear regression analysis was used to develop a

Table 2. GWA of Graduates in Nursing Professional Subjects Comprising NLE NP1-5

GWA	2011 Graduates		2012 Graduates		2013 Graduates	
	Mean± SD		Mean± SD		Mean± SD	
	July	Dec	July	Dec	June	Dec
Over-all Mean	2.29 ±.26	2.48 ±.14	2.20 ±.24	2.52 ±.09	2.32 ±.23	2.45 ±.18
	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory

Table 3. Performance Ratings in the NLE Exams, NP1-5

Nursing Professional Subjects	2011 Graduates		2012 Graduates		2013 Graduates	
	Mean± SD		Mean± SD		Mean± SD	
	July	Dec	July	Dec	June	Dec
Nursing Practice 1	75.46 ± 6.22	67.85 ±11.45	81.31 ±3.56	75.26 ±2.68	77.98 ± 6.80	71.56 ±6.27
	Satisfactory	Barely Satisfactory	Satisfactory	Satisfactory	Satisfactory	Barely Satisfactory
Nursing Practice 2	79.47 ±4.45	76.25 ±5.92	75.88 ±4.20	63.80 ± 9.85	77.18 ± 7.41	72.75 ±6.69
	Satisfactory	Satisfactory	Satisfactory	Barely Satisfactory	Satisfactory	Barely Satisfactory
Nursing Practice 3	78.85 ±5.60	75.56 ±7.18	77.69 ±4.86	66.60 ±10.74	74.05 ± 7.39	67.08 ±8.86
	Satisfactory	Satisfactory	Satisfactory	Barely Satisfactory	Barely Satisfactory	Barely Satisfactory
Nursing Practice 4	75.31 ±6.89	68.13 ±11.35	73.67 ±6.97	69.20 ±9.15	69.84 ±10.02	67.67 ±13.16
	Satisfactory	Barely Satisfactory	Satisfactory	Barely Satisfactory	Barely Satisfactory	Barely Satisfactory
Nursing Practice 5	75.75 ±5.87	69.51 ±7.37	75.46 ±6.53	68.20 ±6.72	72.85 ±9.10	75.75 ±7.05
	Satisfactory	Barely Satisfactory	Satisfactory	Barely Satisfactory	Barely Satisfactory	Satisfactory
Over-all Mean	76.97 ±4.81	59.43 ±6.36	76.81 ±4.10	68.60 ±7.18	74.37 ±7.02	70.98 ±6.35
	Satisfactory	Not Satisfactory	Satisfactory	Barely Satisfactory	Barely Satisfactory	Barely Satisfactory

Table 4. Relationship between E Learning and NLE Performances

Graduates	r value		Significance		Interpretation	
	July/June	Dec	July/June	Dec	July/June	Dec
2011	.70	.45	.000	.083	High Correlation	Not Significant Correlation
2012	.64	.86	.000	.063	Moderate Correlation	Not Significant Correlation
2013	.65	.62	.000	.032	Moderate Correlation	Not Significant Correlation

model for predicting the relationship of E-learning, GWA, and NLE Performances. The E Learning and GWA are all predictors for nursing graduates of 2011, 2012 and 2013. The two predictor models were able to account for 51% (2011); 58 % (2012) and 61% (2013) of the variance of the NLE performances of graduates(Table 6).

DISCUSSION

E-Learning Performances

E-learning brought a revolution to learning and instruction but the various studies cannot prove the superiority of e-learning process over traditional learning (Kokol et al, 2006). The findings of the study of Lahti, Hatonen and Valimaki (2014) also found negative results on the impact of e- learning on the students' knowledge, this may somehow explain the result of E-learning performances from SY 2011-2013 which was only conditional pass.

Students supported the E-learning, however, they reported that sometimes they would prefer the presence of the teacher in cases that they have questions or clarifications. In the one of the main barriers hindering e-learning was the lack of personal contact which prevents human interaction between teachers and students. This may be attributed to the fact that no teacher is available during the session. E-learning support staff were with the students during the entire session to assist the students technically and make sure that the programs of E-learning were running smoothly. In addition, students suggested that inclusion of some materials that are Philippine based would be better. Contrary to this E learning has been endorsed by Ilkay and Zeynep in 2014 as a tool for developing 21st century skills in higher education. E-learning can enhance learners' knowledge and associated abilities through a variety of activities. Nursing students who interact with virtual patients in designed situations may avoid unnecessary risks and encounters with real patients.

The School of Nursing observed that efforts devoted by

Table 5. Relationship between GWA and NLE Performances

Graduates	r value		Significance		Interpretation	
	July/June	Dec	July/June	Dec	July/June	Dec
2011	-.59	-.84	.000	.000	Moderate Correlation	High Correlation
2012	-.72	-.84	.000	.074	High Correlation	Not Significant Correlation
2013	-.74	-.73	.000	.007	High Correlation	High Correlation

Table 6: Multiple Linear Regression Model for Predictors of Nurses Licensure Examination

Predictors	2011 Graduates				2012 Graduates				2013 Graduates			
	Beta	t	Sig	Interpretation	Beta	t	Sig	Interpretation	Beta	t	Sig	Interpretation
NLE	65.93	23.59	.000	Significant	87.95	34.51	.000	Significant	98.79	12.7	.000	Significant
E Learning	.155	15.74	.000	Significant	.065	7.53	.000	Significant	.135	4.17	.000	Significant
GWA	-4.17	-5.52	.000	Significant	-9.04	-11.96	.000	Significant	-16.89	-7.77	.000	Significant

the students in E-learning vary. Other students would still read their text books and spend more time in reading the modules and these are the students who got higher scores in the E-learning exam. It showed that the student motivation and abilities differ and this require individualization and personalization of e-learning courses.

GWA

The GWA performance of the nursing graduates is the aggregated grades of the professional subjects. This is considered the academic performance of graduates in all professional subjects. The GWA is the representation of the overall scholastic standing of students used for evaluation. It is considered the important parameter in the promotion of students in the next level (Salustiano, 2013). The GWA of the nursing graduates were all "Satisfactory" as reflected in their over-all mean of 2.25- 2.5. Although nursing

graduates who took the July/ June NLE have much higher grades than nursing graduates who took the December NLE, GWA performances were considered "Satisfactory". The graduates' GWA performances were also observed to have low standard deviations indicating the close similarities of their performances. The close similarities maybe attributed to comparable capabilities, similar Intelligent Quotient (IQ) levels, then having been exposed to the same learning experiences in the university, they have shown the same level of performances (De Leon, 2013). This finding is also supported by the study of De Guzman and Guy (2013) in which nursing students perform fairly in major subjects.

NLE Performances

Among all of the graduates, the 2011 graduates who took the July examinations had the highest

over-all mean, but still within satisfactory rating. The next higher over-all mean, was attained by the July 2012 takers. The over-all mean of the July 2013 examinees was "barely satisfactory". The graduates' performances were observed to have high standard deviation showing that the performances of the graduates were spread out over a large range of values. The findings revealed that graduates have difficulty passing NP4. NP4 is composed of the subject Curative and Rehabilitative Nursing Care Management. (Medical Surgical Nursing concepts). It is dubbed as the most difficult nursing subtest in the Nursing licensure examination. Graduates had difficulty in passing licensure examination with Medical Nursing Subject. The results of this study support the findings of Neri in 2009 that although graduates succeed in hurdling the exam, they get low passing scores and the lowest scores were in the areas of Medical-Surgical Nursing (Curative and Rehabilitative Nursing Care Management) topics.

This findings is also supported by the study of Palaganas, Divina Gracia and Rosales (2012) and Rosales, Arugay, Divina Gracia and Palaganas (2014) in which the lowest passing percentage observed is in Nursing Practice IV.

Correlation of E-Learning, GWA, and NLE Performances

E learning and GWA performances were related to NLE performances of graduates who took the June and July NLE. E learning performances were not correlated for graduates who took the December NLE. GWA performances were related to NLE performances in graduates who took the December 2011 and 2013. It can be deduced from these data that as E learning and GWA performances of graduates' increases the NLE performances decreases.

E-learning and GWA performances are predictors of NLE performances. It is shown in the model that E-learning and GWA performances are related to NLE performances. Thus, the higher the E-learning and GWA performances the higher the NLE performances and the lower the E-learning and GWA performances the lower the NLE performances. The results of the previous studies of Neri (2009); Ong, Palonpon & Banico (2012); De Leon (2013); and Salustiano (2013) have shown that the GWA and Academic performances of the nursing graduates are good predictors for passing the NLE.

Conclusion

E-learning has many potential benefits to nursing education. Nursing education must take advantage of this new learning experience. However, technology alone cannot provide the learning environment which is meaningful and engaging to students' learning experience. The presence of the teacher is still important in the learning process. Preparations of some E-learning materials that are based on Philippine setting are to be considered. Lastly, E-learning is highly effective to students who are motivated and self-directed. The study concludes that E-Learning and GWA performances of graduates are bases for passing the Nurses Licensure Examination.

Competing interests

The authors declare that they have no competing interests

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