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Research Article

Curriculum Evaluation: Measuring the Students' Achievement of a Program Level Learning Outcomes in the Baccalaureate Degree of Nursing

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Abstract

Background: Excellence in teaching and the quality of outcomes are the targeted goals of higher education, specifically the higher education of Nursing, and is a requirement of the accreditation commissions. To achieve these tasks, regular evaluations of the program curricula is required. **Purpose:** This study aims to provide an innovative way of measuring students' achievement of the nursing courses learning outcomes, explicitly providing one example of the fourth year students' achievement of specific course learning outcomes as part of the accreditation requirement for the nursing curriculum evaluation. **Methodology:** A descriptive cross-sectional design was used to collect the end of semester course evaluation survey of 28 students and document analysis of the final assessment results and assess the course syllabus of the targeted nursing course. A conceptual framework was adopted from Goff, et al. **Result:** The nursing course syllabus provided detailed information about the course learning outcomes, the assessment tasks, and the roles of the curriculum. The final exam analysis revealed that the average mean of the correct answers designed to evaluate the learning outcomes ranged between (88.7% - 94%). The students' end of semester course evaluation survey revealed a general satisfaction of the students with a mean (4.54). **Conclusion:** Assessing the course syllabus, analyzing the final assessment exam, and collecting student feedback provided a strong base for supporting the achievement of the intended course learning outcomes. **Recommendation:** Based on the review of the assessment items, the authors recommended increasing the difficulty level of the final exam and adding short answer questions. Furthermore, other research methodologies are recommended for better outcomes, such as using a mixed methodology.

Keywords: Nursing curriculum; Curriculum evaluation; Learning outcomes mapping; Assessment tasks; Accreditation; Higher education

Introduction

Excellence in teaching and in the quality of outcomes are the targeted goals of different programs in higher education,

specifically in each nursing program, which can be achieved by regular evaluation of the program. The evaluation process can inform the decision-makers and guide the plan of possible improvement [1]. Furthermore, the goals of each curriculum provides specific guidelines and directions to the ultimate learning outcomes and concepts the students have to achieve, and though the learning outcomes need to be evaluated for their effectiveness [2,3]. With the continuously and rapidly changes in the health care sector, the undergraduate nursing curricula are continually changing based on the requirement of the health sector. Currently, it emphasizes on the learner and measurement of learning outcomes, integration into the curriculum of quality and safety concepts, evidence-based practice, translational science and research, and the application of technology to the delivery of the program provide thrilling challenges and opportunities for nurse educators [2,3]. For that, the nursing faculty and educators should consider all of these factors when examining the curriculum and consider any change. Today and tomorrow's curricula call for an integration of learner- and consumer-based processes and, at the same time, ensure excellence by building outcome measures to determine the program's quality [2,3].

The information about the effective curriculum started by the end products, for that defining each Course Learning Outcomes (CLOs) to be achieved by the graduate is the first step for proper planning of the future evaluation of the curriculum [4,5]. Furthermore, the primary Program Learning Outcomes (PLOs) focus on integrating the students' learning abilities, wherein, it has to be easily measurable, transferable and socially oriented [6]. As a requirement of the UAE Commission for Academic Accreditation (CAA), an entire process of how the academics have to evaluate the course learning outcomes (CLOs) and how to link it with the Program Learning Outcomes (PLOS) is one important part of the quality assurance process. As one criteria is to have "An account of the improvements made at course level as a result of regular course evaluation p.11)" [7]. After an in-depth search for a research based information regarding this aspect, merely lack of quantitative research that explains the process in how to evaluate CLOs using the results of the assessment items per course and linking it to the PLOs' achievement, provoke this paper.

The primary aim of this study is to provide an innovative way to assess the students' achievement of the CLOs to be the base of the nursing curriculum evaluation. Moreover, the second aim is to evaluate the achievement of the CLOs of one of the year four nursing courses to serve as an example. For that, the researchers chose to provide an example of one course to help in clarifying the new method of evaluation. The research question guided this article was: Are the assessment methods appropriate for measuring the achievement of the CLOs and PLOs in a fourth-year level course?

Literature Review

The learning outcomes measurement needs prior planning and an in-depth understanding of the evaluation method. The academic faculty need to follow a standardized way in evaluating their CLOs' achievement to be able to compare and contrast the students' achievement from different courses. Many methods can be used to serve this purpose, such as tests. Aiming to ensure that the students' exam results inform the educators about the students' performance regarding specific curriculum anticipations, the development and application of alignment exist in the field of education [8,9]. Furthermore, the curriculum mapping with the assessment tasks can improve the quality of the curriculum delivered [10,11].

Some researchers described a complete process of how they developed and implemented a design to evaluate the nursing curriculum following their national accreditation standards [12]. The researchers followed hierarchy steps starting from mapping the course objectives with the major program goals; then evaluating course content; after that reviewing the schedule; the fourth step is evaluating the teaching strategies; then analyzing the student performance; reviewing the textbooks and other resources; collecting and analyzing the students' feedback; finally validating the education requirements. In conclusion, following the context, content, and conduct model helps continuously evaluate the nursing program.

Alignment of the program level objectives with the assessment items and the clarity of the instructions provided to the students is considered a crucial step in providing a realistic evaluation and improvement of the curriculum. For example, some researchers argued the assessment to follow the No Child Left Behind (NCLB) law [9]. Their argument included the reduced time of teaching, the tapered curriculum, the fewer chances to assess higher order of thinking skills, and reduced drive of teachers and students affected the students' performance [9]. Based on this argument, the researchers discussed different methods and types of curriculum alignment, aiming to help policymakers, educators, and assessment developers, to improve their curriculum, assessment, and curriculum instructions. They reviewed three widely used evaluation methods, the Webb, Achieve, and SEC. They concluded that alignment is a useful method for evaluating the educational processes to support the curriculum objectives [9].

As support to have a link between the CLOs and the assessment, one researcher summarizes the importance of having the intended learning outcomes in improving the veterinary curriculum [4]. Taylor supported the need to map the learning outcomes vertically and horizontally to help the students gain the needed competencies for each specific field. Furthermore, Taylor concluded that the constructive linking of learning with the

assessment items increases the dedicated time required to develop the major program outcomes [4].

In another study, the researchers provided a curriculum evaluation by mapping the learning outcomes with the assessment items, aiming to recommend specific instruction in pharmacy education [10]. The researchers used a descriptive cross-sectional design to study 209 Pharm D students during the academic year 2004/2005. The researchers provided a condensed report using color shading for the competencies taught during the study period. They highlighted the taught competencies in each course; the more covered, the more the condense of the color. They found a harmony between the intended and delivered learning outcomes [10].

While other efforts from pharmacy staff aimed to evaluate the fourth-year program-level learning outcomes in a pharmacy degree [6] the researchers used the mixed methodology to evaluate the successful implementation of a pharmacy degree program. Based on the interview with the faculty, they found that accreditation is the main factor in evaluating the program. The feedback of 1176 second-year students about aligning CLOs with the instructions provided; revealed a 70% agreement on the alignment. The researchers used the students, stakeholders, and faculty feedback to conclude the importance of having good leadership, resourced faculty team, and scholarly approaches.

In summary, the literature consulted in this article supported the mapping between the CLOs and the assessment items. They provided evidence of the effectiveness of linking the results of the assessment to measure the achievement of the course learning outcomes and review the clarity of the course materials and the feedback of the students. However, the quantification of the achievements of each learning outcome needs further exploration.

Theoretical Framework and Conceptual Framework

To guide the process of this study, the researchers adopted the conceptual framework from Goff, et al. [13] to evaluate the CLOs, in which the researchers followed a four-stage cycle. The first stage is to identify the expectation; the second is to map the assessment tasks, the third is to gather and analyze assessment results. Finally, to make program improvement (Illustration 1). In addition, the researchers considered the revised Bloom's Taxonomy to guide the content of the assessment of the fourth year level course [14]. Bloom's Taxonomy is a theory developed by Benjamin Bloom and others in the early 1950s [14]. The theorist provided a classification of the educational curriculum learning outcomes to guide the learning process (Illustration 2). In higher education, Bloom's Taxonomy is widely used in different educational settings and is used in nursing education in specific [15,16].

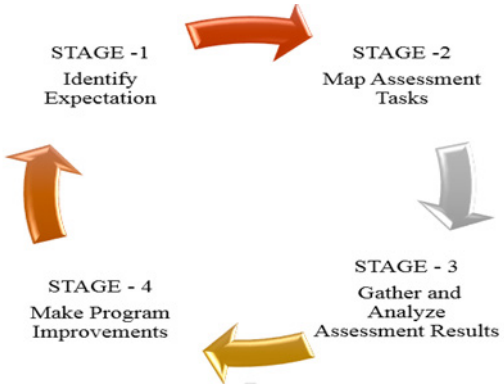
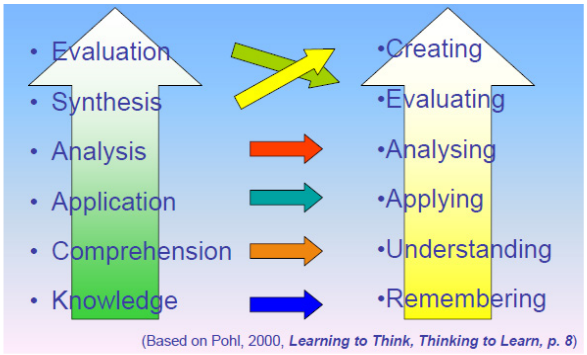


Illustration 1: Four- Stage Cycle for the Assessment of Program-Level Learning Outcomes [13].



Retrieved from: http://www.kurwongbss.qld.edu.au/thinking/Bloom/blooms.htm

Illustration 2: Bloom's Taxonomy and the revised Blooms Taxonomy classification.

Combining Bloom's Taxonomy theory to guide the difficulty of the assessment items and the conceptual framework of Goff, et al., the researchers developed the conceptual framework of this study as shown in Illustration 3. The researchers used Bloom's Taxonomy theory to map the assessment items by explaining the difficulty level of the assessment following the hierarchy or classification of the cognitive dimension and the affective and psychomotor dimensions, which were mainly covered in clinical practice and clinical practice skills (Illustration 2, Illustration 3).

The researchers followed the conceptual framework (Illustration 3), wherein stage one was devoted to setting the evaluation criteria. The criteria identify the course expectation by mapping the CLOs to the expected percentage of the correct answers (average) for all questions used to measure each specific CLO (Table 1). In the example provided, the students have to achieve 70% of correct answers (average) of the questions assigned to measure each learning outcome (Table 1). Furthermore, the

researchers reach a consensus regarding the mapping between the CLOs and PLOs to complete the planning phase that will guide the evaluation of the students' achievement of each CLOs and link it to the achievement of the PLOs (Table 2).

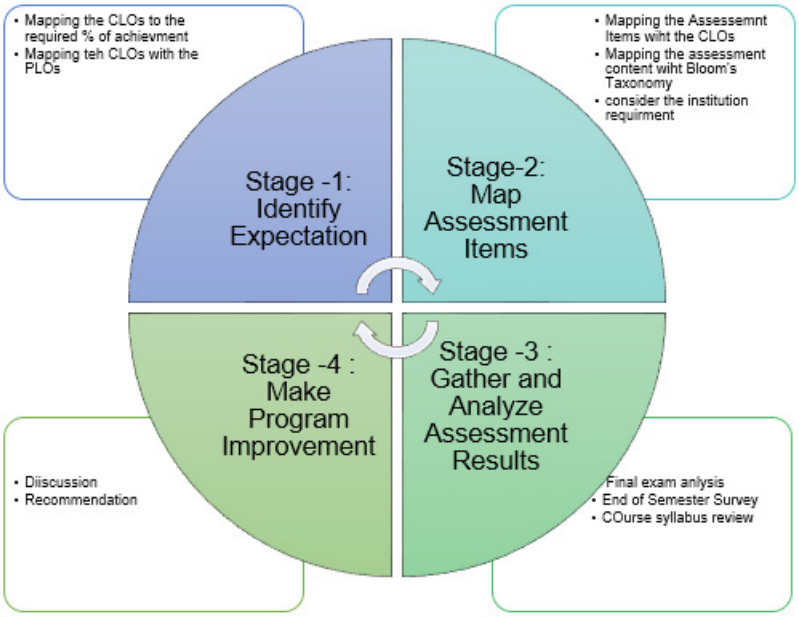


Illustration 3: Conceptual Model for the Study.

Abbreviation	At the end of this unit students will be able to:	Expected Students' Achievement
CLO1	Describe the most important influences on health and wellbeing among the ageing population	**70%**
CLO2	Identify standard ageing patterns, age-related and age acquired illnesses, including chronic conditions.	**70%**
CLO3	Critically analyze at a basic level physiological parameters in association with illness in the older person. Develop a working knowledge of pharmacological agents and factors as they influence the care, treatment, and comfort of older adults.	**70%**
CLO4	Demonstrate an awareness of ageist stereotypes, personal attitudes, beliefs and cultural influences and how they affect ageing and care of older persons.	**70%**
CLO5	Assess, plan and implement effective communication and intervention strategies for the safe nursing care of older adults with compromised cognitive function.	**70%**
CLO6	Demonstrate client-centered nursing care of older adults in acute, specialty and community settings.	**70%**
CLO7	Demonstrate critical thinking in the delivery of evidence-based nursing practices	**70%**
*CLO: Course Learning Outcomes		

Table 1: Fourth-Year Level- Course Learning Objectives.

After the planning was completed, stage two guided the researchers to implement a strategy to evaluate the students' achievement. The strategy was to map the CLOs to the final assessment items. The final assessment was an exam with 60 multiple-choice questions (Table 3, Table 4). The researchers developed the final assessment following Bloom's Taxonomy classification of difficulty index. In which, assigning the low level of difficult questions to measure the students' ability to remember (knowledge) and understand (comprehension) knowledge of different concepts. At the same time, the medium level of difficulty questions to measure the students' ability to apply (application) and analyze (analysis) certain case studies related to the course intended outcomes. Finally, the high level of difficult questions to assess the student's skills in evaluating (synthesis) and creating (evaluation) individualized nursing care for specific scenarios, including complicated health-related cases.

Furthermore, the researchers considered the assessment guidelines of the institution to develop the final assessment. The difficulty index of the final examination was formulated to match the institution's requirements. The guideline specifies the percentage of questions per each difficulty level (Table 2). After finalizing the assessment item, the researchers tested the validity of the test through the review process of the assessment committee.

The actual data collection phase started by administering the final exam and collecting the students' feedback. The researchers followed the research-based to gather and analyze the achievement of the CLOs by analyzing the results of the final assessment and the students' feedback, which is the focus of the discussion in this article, representing stage three of the conceptual framework. Finally, stage four targeted the evaluation of the CLOs achievement by comparing the results to the criteria planned, linking it to the PLOs achievement, and setting recommendations for a possible change in future, based on the results and findings.

*PLOs	Specific **CLOs	Average Percentage of Achievement
PLO-1	1,2,5,6,7	Average achievement=70%
PLO-2	1,2,5,6,7	Average achievement=70%
PLO-3	1,2,3,5,6,7	Average achievement=70%
PLO-4	3,4,5,6,7	Average achievement=70%
PLO-5	1,4	Average achievement=70%
PLO-6	1,3,4,7	Average achievement = 70%
PLO-7	3,7	Average achievement = 70%
*PLO: Nursing Program Learning Outcomes; **CLO: Course Learning Outcomes		

Table 2: The Course Learning Outcomes (CLOs) mapping to the Program Learning Outcomes (PLOs).

Methodology

Design of the Study

A descriptive quantitative, cross-sectional survey design was used to collect the feedback from the fourth-year nursing students and document analysis to analyse the students' responses to the final assessment and the course syllabus. The researchers analyzed the course syllabus and benchmarked the findings with Griffith university course syllabus as one of the top nursing schools in the world.

Population, Sample and Sampling Technique

The sample followed the convenience technique to collect the survey from the fourth-year nursing students of one of the higher education institutions in Abu Dhabi (AD) and Al Ain (AA). The sample size was 28 students with a response rate of 93%, in which 12 (42.9%, n=28) students were from AD and 16 (57.1%, n=28) students were from AA. While the final exam sample was 30 (100%) as all the fourth-year nursing students who are registered in the specific course completed the exam. Since this study aims to analyse the achievement of specific course learning outcomes and the course was taught only in the first semester on two different campuses, the researchers have no other options to use other sampling techniques other than recruiting the current students registered in the course. The researchers analyses and assessed the final exam results and the course syllabus for the document analysis.

The Instruments-Reliability and Validity

The researchers used two instruments: the final assessment exam, consisting of 60 multiple-choice questions. The instrument face and content validity were checked by an expert faculty member of the assessment committee of one of the higher education institutes in AD. The researchers used the expert panel consensus on the final exam. The process started by developing the exam questions to measure the Course Learning Outcomes (CLOs) by expert lecturers. Then the initial draft was sent to the assessment committee chair (the academic responsible for ensuring the quality of the assessment items) to review the final exam. The assessment chair assigned anonymous reviewers from the assessment committee who are experts on the topic of the exam. The final exam of the specific nursing course was moderated by two experienced staff before administering to the students. The expert panel recommended some minor modifications. The researchers completed the modifications and received the approval of the assessment committee. The researchers covered all the course learning outcomes in the final exam, and the mapping aimed to measure the students understating of the concepts delivered by measuring the learning outcomes achieved. Furthermore, the researchers used the classification of Bloom's Taxonomy to help

in specifying the difficulty index for each question, wherein the number of the low difficulty questions was 33 (55%), the number of the medium difficulty questions was 20 (33.3%), and the number of the high difficulty questions was 7 (11.7%) (Table 3). Besides, the researchers ensured that delivering the exam matched the institution guidelines.

The Institutional Guidelines of the Level of Questions Difficulty per each Exam	Abbreviation
30-35% of low difficulty questions (knowledge)	*L
50% of medium difficulty questions (analysis)	**M
10-15% of high difficulty questions (synthesis)	***H
*L: Low Difficulty Level; **M: Moderate Difficulty Level; ***H: High Difficulty level	

Table 3: The Institutional Guidelines of the Level of Questions Difficulty per each Exam.

The second instrument is the end of semester course/teaching evaluation. The researchers used the End of Semester Evaluation (ESE) survey of the higher education institute- to collect the students' feedback about their experiences while studying this course. The ESE survey consists of six questions with a Likert scale ranging from very poor (1) to very good (5). The questions were developed to collect information about the students' experiences with the course organization, clarity of the assessment items, the feedback from the instructor, the quality of the teaching strategies and finally, their overall satisfaction. The researchers measured the reliability of the ESE survey by Cronbach's Alpha and was 0.89 (Table 4), which is highly reliable [17]. A plan to add a structured interview will be beneficial in understanding the students' lived experience regarding achieving the course objective, and if so, using the triangulation method in this research will increase the results validity and reliability [18].

Difficulty of ****MCQ	Actual MCQ No.	Percentage	
*L	33 out of 60	55 %	
**M	20 out of 60	33.3 %	
***H	7 out of 60	11.7%	
*L: Low Difficulty Level; **M: Moderate Difficulty Level; ***H: High Difficulty level; ****MCQ: Multiple Choices Questions			

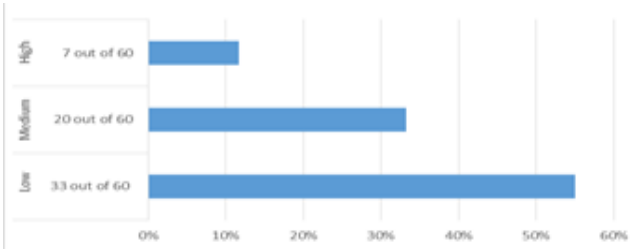


Table 4: Difficulty Index-Aged Care Nursing Final Exam.

Method of Data Collection and Ethical Considerations

The researchers obtained ethical approval from one of the higher institution colleges. Then collected the students' responses to the final assessment exam by the end of the academic semester. Each end of semester exam is controlled by the institution policy in which it ensures the allocation of the private hall, students' identification, providing invigilators to maintain the credibility of the exam, and control the time allocated for each exam. The students used the computer bubble sheet (Scantron sheet) to fill in the responses to each question. The academic faculty used the computer bubble sheets to analyze the students' responses using the Scantron machine (a scanner machine that electronically analyses the students' answers). Using hard copies, the researcher collected the ESE survey to the students before the final exam. The researchers gain the verbal consent of the students to participate in this survey after explaining to them the research objective. Furthermore, they considered that the returned survey as an agreement to participate. To keep the anonymity of participants, the researchers presented the exam results using the average of correct answers only, and the questionnaire lacked any demographic data to ensure the anonymity of the responses [17]. Besides, the researchers assured the participants that this information would be confidential and used for research and quality improvement of the course [17].

Furthermore, all information was saved on the principal investigator's laptop. A password locks the computer; only the researchers have access to the information to keep all the information confidential. To ensure the accuracy of the data collected, the research team completed an extensive review of

the final assessment exam results. Two researchers summarized the results into tables and rechecked the data after one day to double-check and confirm the accuracy of the presented data. The students' results were reviewed anonymously in which all students' information was covered. Only the average correct responses for each question were presented in the exam analysis.

Similarly, the average of the students' responses to the ESE Survey was used for analysis. Finally, the achievement results were presented anonymously as the average response rate. For the course syllabus, two researchers analyses the document individually and benchmark it with Griffith University as one of the top nursing schools in the world. Then the two analysis were compared and contrasted to ensure the credibility and trustworthiness of the analysis.

Method of Analysis

Analyzing the specific course achievement followed the conceptual framework described previously. In which the final assessment questions were mapped with the course learning outcomes. Furthermore, the researchers developed the questions to match the difficulty levels of the institution guideline (Table 2) and follow the Blooms Taxonomy (Illustration 2). The researchers chose specific questions to measure each learning outcome using different difficulty levels. Table 5 listed all the 60 questions with their mapping to the course learning outcomes and the difficulty level. In addition, the researchers added the response of the correct answers after analyzing the students' responses to the exam.

The analysis found that the total number of students who completed the exam was 30 (100%). The researchers used the Scantron machine to provide the descriptive statistics of the students' correct answers to each question, in which the Scantron machine provided a student response report with the average percentage of the correct answer per question (Table 5). After that, the average correct answer (Percentage %) for each question was summarized in Table 5. The next step is to measure the average of the students' responses to each difficulty level of the questions (Table 6) using the descriptive equation of the mean ($\overline{X} = (\Sigma xi) /n$). In this step, the researchers collated and grouped all the correct answer percentages for each difficulty level and measured the average (mean) of the correct answer per each difficulty group.

Case Processing Summary		N	%
Cases	Valid	28	100.00
	Excluded	0	.00
	Total	28	100
Reliability statistics			
Cronbach's Alpha		No of Items	
.89		6	

Table 5: Questionnaire Reliability.

Questions (Q)	Difficulty Index	Learning Objectives (CLO) as per the course guide							Grade	Exam Result (Correct answers average %)
		CLO.1	CLO.2	CLO.3	CLO.4	CLO.5	CLO.6	CLO.7		
Q1	H	✓			✓				1 mark	64 %
Q2	L		✓	✓	✓	✓			1 mark	100%
Q3	L	✓	✓					✓	1 mark	100%
Q4	M	✓	✓	✓				✓	1 mark	73 %
Q5	H	✓	✓						1 mark	55 %
Q6	M	✓	✓						1 mark	91%
Q7	L	✓	✓						1 mark	100%
Q8	L	✓	✓						1 mark	100%
Q9	M	✓	✓					✓	1 mark	91%
Q10	L	✓	✓						1 mark	100%
Q11	L		✓	✓				✓	1 mark	82%
Q12	M		✓	✓				✓	1 mark	91%
Q13	L	✓	✓				✓	✓	1 mark	100%

Q14	M		✓			✓			1 mark	91%
Q15	L		✓					✓	1 mark	100%
Q16	L		✓				✓		1 mark	100%
Q17	L			✓					1 mark	100%
Q18	L			✓		✓			1 mark	100%
Q19	L	✓		✓					1 mark	100%
Q20	M		✓	✓					1 mark	82 %
Q21	L	✓	✓				✓	✓	1 mark	100%
Q22	L	✓		✓				✓	1 mark	100%
Q23	L		✓	✓					1 mark	100%
Q24	L	✓	✓						1 mark	100%
Q25	M		✓	✓					1 mark	91%
Q26	H	✓	✓	✓					1 mark	36 %
Q27	M	✓				✓		✓	1 mark	91 %
Q28	M	✓				✓		✓	1 mark	82 %
Q29	H	✓		✓					1 mark	73 %
Q30	L					✓		✓	1 mark	100%
Q31	H			✓				✓	1 mark	64 %
Q32	M		✓	✓					1 mark	91 %
Q33	L		✓	✓					1 mark	100%
Q34	M		✓	✓					1 mark	91 %
Q35	L				✓				1 mark	100%
Q36	M			✓	✓			✓	1 mark	82 %
Q37	M	✓	✓		✓				1 mark	82 %
Q38	L	✓	✓				✓		1 mark	100%
Q39	L	✓	✓					✓	1 mark	100%
Q40	L		✓				✓		1 mark	100%
Q41	L		✓	✓					1 mark	100%
Q42	H		✓				✓	✓	1 mark	73 %
Q43	L		✓			✓	✓		1 mark	100%
Q44	H			✓				✓	1 mark	64 %
Q45	L			✓					1 mark	100%
Q46	M		✓				✓		1 mark	82%
Q47	L		✓		✓				1 mark	100%

Q48	L	✓	✓			✓		✓	1 mark	100%
Q49	L		✓	✓					1 mark	100%
Q50	M		✓	✓					1 mark	73%
Q51	L		✓			✓	✓		1 mark	100%
Q52	M				✓				1 mark	91%
Q53	M					✓	✓	✓	1 mark	91%
Q54	L	✓	✓						1 mark	100%
Q55	L			✓					1 mark	100%
Q56	L			✓				✓	1 mark	100%
Q57	M	✓						✓	1 mark	82%
Q58	L	✓	✓			✓	✓		1 mark	100%
Q59	L		✓	✓					1 mark	100%
Q60	M		✓						1 mark	91%
Total	*L	13	24	14	3	8	7	10	60 marks	
	*M	7	13	8	3	4	2	8		
	*H	4	3	4	1	1	1	2		

*L: Low Difficulty Level; **M: Moderate Difficulty Level; ***H: High Difficulty level; ****Q: Question; CLO: Course Learning Outcomes

Table 6: Mapping of the final exam with the course learning outcomes.

Finally, the students average of correct answers per the difficulty level were benchmarked with the course learning outcomes and the analysis of the students' achievement of the course learning outcomes (Table 7). The researchers counted the number of questions of each level of difficulty for each learning outcome vertically. Then the average percentage for each difficulty level was multiplied by the number of the questions designed to achieve the learning outcomes and then divided by the total number of the questions. Course Learning outcome (CLO) achievement = CLO_i (no. of questions with low difficulty assigned to measure CLO_i X percentage of the correct answer of the low difficulty) + (no. of questions with moderate difficulty assigned to measure CLO_i X percentage of the correct answer of the moderate difficulty) + (no. of questions with high difficulty assigned to measure CLO_i X percentage of the correct answer of the high difficulty) all divided by the total number of questions assigned to measure CLO_i.

Results

The overall final exam results were; the maximum score is 98%, the minimum score is 83%, the average is 91%, SD=5. However, the analysis focuses on the average percentage of the correct answers. The researchers found the average of correct answers for all questions grouped under each difficulty level to be 100% (no. of MCQs=33 out of 60) for the low difficulty level, 86.6% (no. of MCQs=20 out of 60) for the moderate difficulty level and 61.3% (no. of MCQs=7 out of 60) for the high difficulty level (Table 4, Table 7). While the vertical analysis for the average of correct answers assigned to measure each CLO was found to be 89.6% for CLO1 (example of analysis: Low difficulty (13 MCQs x100%) + Moderate Difficulty (7 MCQs x 86.6%) + High difficulty (4 MCQs x 61.3%) / total number of questions (24 MCQs)), 92.7% for CLO2, 89.9% for CLO3, 88.7% for CLO4, 92.9 for CLO5, 93.5 for CLO6, and 90.8 for CLO7.

Difficulty Index	Students Response Percentage	Number of Answers	
*L	Average = (33x100%)/33= **100%**	33 out of 60	
**M	Average =(7x82%)+(11x92%)+(2x73%) /20 = **86.6%**	20 out of 60	
***H	Average = (1x64%)+(1x55%)+(1x36%)+(1x73%)+(1x64%) +(1x73%)+(1x64%) / 7= **61.3%**	7out of 60	
*L: Low Difficulty Level; **M: Moderate Difficulty Level; ***H: High Difficulty level			

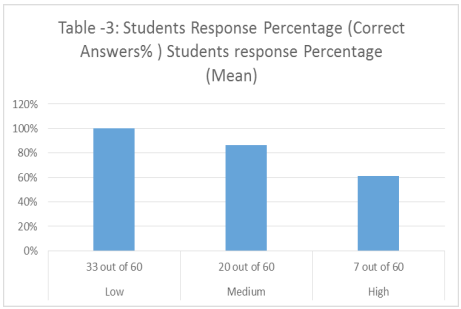


Table 7: Students Response Percentage (Correct Answers%).

The results of students' achievements of the specific course outcomes ranged between 88.7% to 93.5%. The highest average of the correct answers was toward achieving CLO6 with 93.5% of correct answers, which was "Demonstrate client-centered nursing care of older adults in acute, specialty and community settings". Almost 94% of the students showed their ability to demonstrate client-centered nursing care [19]. This skill was built accumulatively from year two and was part of the five prerequisite courses. Though measuring their ability to achieve this learning outcome was as expected to be high.

The second-high average of correct answers was toward CLO5 with 92.9%. The intended learning outcome was to measure the students' ability to demonstrate effective communication and intervention strategies for safe nursing care for elderly with compromised cognitive function. The materials to achieve this learning outcome was delivered over two weeks, and though the weight of the questions was less in comparison with the questions allocated to measure the achievement of CLO2. Almost 93% of the students achieved higher than 70%.

The third high average was toward achieving CLO2 with 92.7% of the correct response. CLO2 was formulated to identify the standard ageing patterns and age-related health issues. The major component of this course was to provide the students with the needed knowledge about the ageing process and its related health problems, including all body systems. For that, around 40 questions from the three difficulty levels were assigned to measure the achievement of these learning outcomes [20]. Around 93% of the students could synthesis the knowledge and provide correct answers that indicate their ability to achieve CLO2.

The seventh Course Learning outcome was achieved by 90.8% of the students who correctly answered the question measuring it. The fourth-year students showed their skills in critically analyzing the evidence-based nursing practices and critically synthesizing the nursing care by creating a specific nursing care plan based on elderly health-related scenarios; considering that the students had the research and evidence-based practice related skills part of the nursing curriculum.

The correct response to achieve the third Course Learning outcome was 89.9%. Almost 90% of the students were able to analyse the basic physiological parameters and develop a working knowledge of pharmacological agents to help the elderly population. The information covered by CLO3 was covered in all course lectures as part of the disease management and nursing care needed for each illness. For that, the number of questions allocated to measure CLO3 was relatively high [21].

The percentage toward achieving CLO1 was 89.6% which was "Describe the most important influences on health and wellbeing among the ageing population". Almost 90% of the students were able to show their ability to solve problems related to the critical influences on the elderly health. Even though this information was relatively new to them, by benchmarking the average of the correct answers to the planned, expected outcomes (70%); the students achieved CLO1.

Finally, the lowest average went toward CLO4 with 88.7%. The content delivered to achieve this learning outcome was only one lecture, with tutorial sessions to identify the ageist stereotypes, the students' attitudes, beliefs, cultural influences, and how they affect ageing and care of older persons. The weight of questions to measure the achievement of these objectives was limited based on the material weight. However, around 89% of the students could correctly answer the questions assessing CLO4. As provided, the benchmarking criteria for measuring the achievement of the CLOs was 70%; positively, the CLOs for the Aged care-nursing course were achieved.

Results of the Students' Feedback

The researchers collected 28 responses for the ESE survey from two different campuses of one of the higher education

colleges in Abu Dhabi; the attrition rate was very minimal and represented only 6.6% of the fourth year cohort. The response rate was 93.3% which is considered a high response rate. The SPSS software version 20 was used to analyse the results. The descriptive statistics of mean, frequency and Standard Deviation (SD) were used to present the results. As shown in Table 8, the mean of the students' responses ranges from 4.54 (SD=0.51) to 4.68 (SD=0.48). The highest mean was the participants' responses to the survey item indicating the assessment clarity. All the students provided an excellent score that indicated the students' general satisfaction with the assessment items of this course. A second-high score went to the survey items about the organization of the course. The results indicated that the students agreed and were satisfied with the course organization with a mean of 4.64 (SD=0.49).

The participants indicated that the academic faculty provided continuous feedback about the assessment items, with a mean of 4.57 (SD=0.5). Furthermore, the participants agreed on the valuable course materials with a mean of 4.57 (SD=0.5). The learning motivation of the course was given the lowest mean of 4.54 (SD=0.51). In general, the participants indicated their overall satisfaction with the course with a mean of 4.54 (SD=0.51). To look in-depth at the participants' feedback, the frequency distribution was tested for each survey item presented in Table 9. The frequency of the good (4) responses ranges from 9 to 13 responses for all survey items. While the frequency responses for the very good (5) ranges from 15 to 19 responses. This indicated that most of the respondents were toward providing very good feedback.

To look into the frequency of each survey item, the participants were satisfied with the course organization, with either good (35.7%) or very good (64.29%) organization, with a mean of 4.64, SD=0.49 (Table 8). These results indicated that the course syllabus, the instructions, and the assessment items were organized. At the same time, the second item targeted the students' experiences with the type of feedback received from the course instructors. Almost all students responded by either good (42.86%) or very good (57.14%) with a mean of 4.57, SD=0.5. Obviously, the students' responses supported the good feedback they received from the course instructors.

CLOs	No. of MCQ based on Difficulty index for each CLO			CLOs Achievement
Average % Correct Answer	*L=100%	**M=86.6%	***H= 61.3%	
****CLO.1	13	7	4	(13x100%)+(7x86.6%)+(4x61.3%)/24= 89.6%
CLO.2	24	13	3	(24x100%)+(13x86.6%)+(3x61.3%)/40= 92.7%
CLO.3	14	8	4	(14x100%)+(8x86.6%)+(4x61.3%)/26=89.9%
CLO.4	3	3	1	(3x100%)+(3x86.6%)+(1x61.3)/7=88.7%
CLO.5	8	4	1	(8x100%)+(4x86.6%)+(1x61.3)/13=92.9%
CLO.6	7	2	1	(7x100%)+(2x86.6%)+(1x61.3)/10=93.5%
CLO.7	10	8	2	(10x100%)+(8x86.6%)+(2x61.3%)/20=90.8%

*L: Low Difficulty Level; **M: Moderate Difficulty Level; ***H: High Difficulty level; ****CLO: Course Learning Outcomes

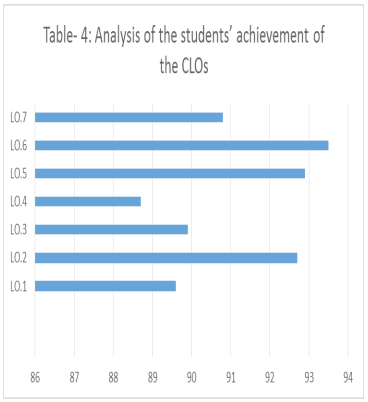


Table 8: Analysis of the students' achievement of the CLOs.

To evaluate the students' perceptions regarding the quality of the course materials and the teaching strategies. The majority (57.14%) responded by very well, while less than half of the participants (42.86%) responded by good. Overall the students were happy with the course materials and teaching strategies with a mean of 4.57, SD=0.5. The clarity of the assessment items was well perceived, with the responses being either good (32.14%) or very good (67.8%) with a mean of 4.68, SD=0.48. Besides, the students' engagement in the course learning activities were high as the responses were either good (46.43%) or very good (53.57%) with a mean of 4.54 and standard deviation of 0.51. Finally, the students were satisfied with the course in general by either good (42.43%) or very good (57.57%) with a mean of 4.54, SD=0.51 (Table 10).

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DESCRIPTIVES
  /VARIABLES= Organised feedback teaching assessment engagment overall.

Valid cases = 28; cases with missing value(s) = 0.
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Variable	*N*	*Mean*	*Std Dev*	*Minimum*	*Maximum*
This course was well organized	28	4.64	.49	4.00	5.00
I received helpful feedback on my assessment work	28	4.57	.50	4.00	5.00
The teaching (lectures, tutors, online..ect) on this course was effective in helping me to learn	28	4.57	.50	4.00	5.00
The assessment was very clear and fair	28	4.68	.48	4.00	5.00
The course engaged me in learning	28	4.54	.51	4.00	5.00
Overall, I am satisfied with the quality of this course	28	4.54	.51	4.00	5.00

Table 8: Descriptive analysis of the End of Semester Evaluation (Students' Feedback) survey.

Survey Items	Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
This Course was well organized	Good	4.00	10	35.71	35.71	35.71
	Very Good	5.00	18	64.29	64.29	100
The assessment was very clear and fair	Good	4.00	9	32.14	32.14	32.14
	Very Good	5.00	19	67.86	67.86	100
I received helpful feedback on my assessment work	Good	4.00	12	42.86	42.86	42.86
	Very Good	5.00	16	57.14	57.14	100
The course engaged me in learning	Good	4.00	13	46.43	46.43	46.43
	Very Good	5.00	15	53.57	53.57	100
The teaching (lectures, tutors, online, etc.) on this course was effective in helping me to learn	Good	4.00	12	42.86	42.86	42.86
	Very Good	5.00	16	57.14	57.14	100
Overall, I am satisfied with the quality of this course	Good	4.00	13	46.43	46.43	46.43
	Very Good	5.00	15	53.57	53.57	100

Table 9: Descriptive frequency of the End of Semester Evaluation survey.

Criteria of Comparison	One of Abu Dhabi Higher Education Institutions	International Institution (Griffith University)	Comments
Course description	Yes	Yes	
Course Learning Outcomes	Yes	Yes	
The assessment plan and weight	Yes	Yes	
Updated Textbooks and other resources	Yes	Yes	
Clear Roles and Responsibilities of the students,	Yes	Yes- Hyperlink	
The rubrics	Clear	Clear	

Table 10: Course Syllabus- Evaluation Criteria.

Course Syllabus Analysis Results

The course syllabus was read and re-read by two researchers. The document analysis aims to assess the clarity of the information about the course learning outcomes and the assessment items. The researchers used specific criteria to compare and contrast the course syllabus with Griffith University. The document analysis criteria were about the course description, the learning outcomes, the assessment plan and weight, the textbooks and other resources, the roles and policies of the students, and the rubrics.

The specific course is a fourth-year course offered during the first semester over 16 weeks. The content of this course focuses on the needed concepts to understand the nature of the health-related issues of the elderly population. This course requires the completion of five prerequisite courses. All the prerequisites are core nursing courses that equip the students with the knowledge and skills regarding nursing care. The theory part introduces the normal ageing processes of the elderly life span; to help the students understand the health-related changes in the elderly, in addition to helping them to understand and use the different adaptive or coping strategies the elderly and their families may need to continue their life with fewer complications. To apply the concept of elderly care, the students have to register concurrently in the clinical course. The two courses help equip the students with the needed skills and competencies to deal with different clinical situations related to elderly nursing care, congruent with a fourth-year student level.

After benchmarking the content of the course syllabus, the researchers found that the course syllabus included clear information about the course description that provided the readers with the nature of the course. The course syllabus started by describing the main aims and what is expected from the students; next the learning outcomes were listed. The learning outcomes were similar to the learning outcomes of the international schools. The assessment items then were listed in which there a table was summarizing all the assessment items. After that, the assessment items were described clearly, including the college's policy. In contrast, the international nursing school provided a hyperlink to the policy rather than listing it in the course syllabus.

The course syllabus then provided a table with the students' attributes. In summary, the academic faculty provided the students with a clear guide, and maybe we can call it a course guide rather than a course syllabus because all the needed information was listed in this syllabus.

Discussion

To provide a numerical estimation of the course learning outcomes' achievement is quite confusing, specifically if you are looking to measure it manually. However, after analyzing the final assessment of the specific nursing course, the achievement of the learning outcomes was tested using different methods. Initially, assigning the end of semester exam to measure the achievements of the learning outcomes is considered acceptable under the condition of the exam covering all the course's learning outcomes. Furthermore, the end of semester exam weighs 40% of all assessment items, which may indicate the students' achievement. Besides, using different difficulty levels of questions ensured the students' ability to memorize, understand, analyse, evaluate and retain knowledge about the course-related concepts; the method adopted is similar to the SEC methodology to enhance the validity of the final assessment content [9].

In the example provided, the average of the correct students' responses to answer the final exam was used to evaluate their course learning outcomes. Each Course learning outcome was assessed using the three levels of difficulty index to ensure that the students could synthesis the learned materials. For example, to assess the CLO1, there was (13) low difficulty, seven medium difficulties, and four high difficulty questions. Furthermore, the questions weight per each CLO was assigned according to the materials covered. For instance, CLO4 was toward specific stereotypes of ageism which represent only one portion of a lecture-based material. Considering ageism for the written assignment as part of

the assessment items; led to a decrease in the number of questions allocated to measure the achievement of CLO4.

Considering the initial planning for evaluating the CLOs, is one important task to guide the evaluation of the students' achievements of the specific CLOs. The academic can provide an estimated percentage to judge the students' achievement with proper planning.

The Course Syllabus Assessment

The course syllabus was reviewed to assess the clarity of instructions regarding the Aged Care Nursing information about the course learning outcomes, the assessment matrix, and the roles and regulations of the course. The assessment findings supported the clarity of information in which the course learning outcomes were presented on the first page of the syllabus, and also it was aligned with the assessment items. The assessment plan and weight were presented in two forms; first, it was listed in a table and then it was narratively explained, directing the students toward the course learning outcomes to be achieved. The roles and policies of the course, the rubrics, and the resources needed were listed in clear formatting. By these findings, the second research hypothesis was met.

Conclusion

Using the Goff, et al. four-stage cycle to evaluate a program-level curriculum was helpful. The author identified the expectations of the students' achievement, mapped the assessment tasks to the learning outcomes, gathered and analyzed the assessment results and finally recommended specific improvement points. In addition, assessing the course syllabus, analyzing the final assessment exam, and collecting the students' feedback provided a strong base for supporting the achievement of the intended learning outcomes of the specified course [13].

Recommendations

The quality of each course needs to be considered to increase the academic faculty accountability for their work. The evaluation of each course learning outcome can be cross-mapped with the nursing program goals and objectives. Moreover, the researchers found the importance of evaluating the course achievement using the quantitative approach. For the specific sample included in this study, they recommend increasing the difficulty level of the final exam and adding short answer questions. Furthermore, to set a future recommendation to use a mixed methodology for better outcomes.

Contributors

All authors have made substantial contributions to this paper regarding the study's conception and design.

Ethical Approval

The study was approved by the ethical committee where the study took place. Reference number: FCHS/RECA/# INTSTF001BSN20.

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21. One of the higher institution in Abu Dhabi (2017) Assessment Moderation Policy 1-3.

Question	Very Poor (1)	Poor (2)	Average (3)	Good (4)	Very Good (5)
This course was well organized	□	□	□	□	□
The assessment was very clear and fair	□	□	□	□	□
I received helpful feedback on my assessment work	□	□	□	□	□
The course engaged me in learning	□	□	□	□	□
The teaching (lectures, tutors, online, etc.) on this course was effective in helping me to learn	□	□	□	□	□
Overall, I am satisfied with the quality of this course	□	□	□	□	□

Appendix 1: End of Semester Evaluation (ESE)-Student's Feedback Survey.