

Outcome-Based Education: Comparing Students' Perceived Learning Outcomes with their Assessment Scores

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ABSTRACT

The purpose of this study was to ascertain whether the perception of the 30 undergraduates in the Faculty of Dentistry who underwent the Language Enhancement for the Health Sciences course regarding their mastery of the learning outcomes was reflected in their assessment scores as a result of the teaching learning process using the OBE & SCL curriculum. These students learnt skills broadly under four course outcomes which were further subdivided into 24 learning outcomes. The four course outcomes were assessed through four on-going formative assessments. Students responded to a Course Entrance Survey and a Course Exit Survey. Their responses to both these surveys were analysed using the paired samples t-test to find out the differences in their perception of their mastery of the learning outcomes. The differences in their perception were compared to their performances in the assessments using the Pearson correlation analysis. Although there was a significant difference in the students' perception of their mastery of the learning outcomes, it was not reflected in their performances in the assessments.

Keywords: *assessing student perception, course entrance/exit survey, course/learning outcomes, outcome-based education*

INTRODUCTION

Since its inception in 2009, the Malaysian Qualifications Agency (MQA) under the purview of the Ministry of Higher Education has embarked on accrediting all programmes taught in both private and public universities in Malaysia by way of the Malaysian Qualifications Framework. It is an instrument specifically designed to help these institutions of higher learning either to develop or classify existing programmes based on a set of criteria that is benchmarked against international best practices catered to the employment market. Under the framework, the learning outcomes, credit hours and student learning time for each of the eight academic levels offered ranging from certificate to doctoral levels should be specified (MQF, 2010).

The learning outcomes are the point of reference for the classification of the curriculum for the teaching and learning of an existing course. These are “statements that explain what students should know, understand and can do upon completion of the period of study” (MQF, 2010, p. 3). In Spady’s words, learning outcomes should be “clear observable demonstrations of student learning that occur at or after the end of a significant set of learning experiences” (1994, p. 2). Therefore, in the development and design of any course, the learning outcomes must be clearly spelt out so that the lecturer has a clear idea of what he or she has to teach in a course and the learners have a clear understanding of what they will learn in a course.

Equally important to learning outcomes is the specification of assessments of students based on the the learning outcomes. According to the MQA’s Code of Practice for Programme Accreditation (COPPA), assessments can take two forms, that is, formative assessments which “monitor the achievement of the learning outcomes” and summative assessments which “gauge the level of achievement of the learning outcomes” (2010, p. 18). COPPA also advocates three modes of assessment and they are tutor/lecturer assessment, peer assessment and self-assessment. Tutor/lecturer assessment involves the lecturer or tutor assessing the students based on their performance in tests, oral activities, projects and case studies to name a few. As for peer assessment, it involves evaluating a fellow classmate on an assigned task based on a given set of criteria. On the other hand, self-assessment enables students to monitor, reflect and evaluate their own learning. Such a form of assessment can involve the use of

reflective journals, blogs as well as course entrance and course exit surveys. Therefore, students' achievements are measured through assessments that closely represent the learning outcomes or what they will be able to do at the end of a period of study.

Given this shift from traditional teacher-centred learning to student-centred learning, UiTM implemented Outcome-Based Education and Student-Centred Learning (OBE & SCL) as of July 2010 in the teaching and learning process. According to UiTM's (2011) OBE & SCL official website, OBE is "a method of curriculum designing and teaching that focuses on what students can actually do after they are taught" (p. 1). As such, the emphasis is on the most effective ways to facilitate the "desired final outcome" (p. 1).

According to Spady (1994), the leading advocate of OBE, this approach to education

"... means clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction, and assessment to make sure this learning ultimately happens" (p. 12).

He states that in structuring a curriculum, it is important to specify the "enabling outcomes" or the "key building blocks" (p. 8) that would enable learning to take place, which are in practice, the course content. According to Spady (1994), the learning outcomes or "exit outcomes" and the "enabling outcomes" (p. 8) or the course content are used to develop teaching strategies as well as assessment and performance standards so as to ensure that successful learning takes place.

In short, when drawing up courses to be taught under OBE, it is important to first decide what is essential for the learners to be able to do so as to prepare them for life and the workplace. The OBE is viewed as a 'life-performance' approach where the focus is on the long term benefits, as students acquire knowledge and skills which will be useful to them in

their careers and life after they have graduated (Spady in Killen, undated). Once it has been decided what it is that learners need to be able to do, then based on this decision, the components of learning or learning outcomes are identified. These are essentially the course content to be taught. These outcomes or 'enabling outcomes' (Spady, 1994) are expressed as what the students can do. The next step is then to draw up a set of course outcomes or 'exit outcomes' (Spady, 1994) articulated as specific statements that clearly state what the learner is expected to be able to achieve at the end of the course. These are statements that explain what the learner is expected to know, understand and do upon completion of the course. These according to COPPA (2010) "must be doable, measurable, observable and assessable" (p.7). Therefore, to ascertain how much has been learned at the end of the course, it is essential to conduct 'discreet assessment tasks' which are as authentic to the workplace and life experiences as is possible. This enables the volume of learning to be quantitatively measured. As such, in the teaching process under OBE, the focus is on the desired end results of the course.

As mentioned earlier, in July 2010, UiTM in keeping with the Ministry of Higher Education's requirement that all tertiary institutions meet the requirements of the Malaysian Qualifications Agency (MQA), implemented OBE & SCL. In keeping with this, the Language Enhancement for the Health Sciences course (BEL 413), an English Language course offered by the Academy of Language Studies to students in the Bachelor of Dentistry programme was reviewed. As specified in OBE & SCL (2011), a total of 24 learning outcomes or 'enabling outcomes' that made up the course content were identified. Then based on these learning outcomes, four course outcomes were drawn up which clearly articulated what the students are expected to know, understand and be able to do at the end of the teaching-learning process. All these course outcomes reflect the life roles these students will play as dental doctors upon graduation. For each course outcome, an on-going formative assessment was developed to measure how much has been learned at the end of the course. For Course Outcome 1, that is, 'Listen and Understand Short Health Professional-Client/Colleague Interactions', the assessment tool used is a short role play interaction in a work-related situation. As for Course Outcome 2, that is, 'Interact Effectively in Simulated Hospital Environment', the tool used is a discussion in a simulated hospital environment. For the third course

outcome, that is, 'Comprehend Health-Related Texts/Articles', a reading comprehension test was used as tool to measure Course Outcome 3. For the final course outcome, that is, 'Summarise Short Health-Related Texts', the assessment tool is a focused summary writing test based on an authentic health-related text.

The revamped BEL 413 course in line with OBE & SCL was taught to 30 second semester students undergoing the Bachelor of Dentistry programme beginning July 2010. The intake that semester consisted of only 30 students. In implementing OBE & SCL, it is also required that what the students know, understand and can do at the end of the teaching-learning process are measured. In other words, there is a need to close the loop. According to the Assessment Toolbox of the Columbus State Community College (2006, p. 1) "Closing the loop is the process by which assessment results are used in programmatic and campus-wide decisions to impact student learning. ..., it provides data/evidence for decisions for changes in pedagogy and curriculum - taking relative feedback and doing something with it." In UiTM, one of the components used in closing the loop in the OBE & SCL context is by collecting empirical data of the students' perception of their entrance and exit level knowledge for the purpose of reviewing and making improvements to the curriculum. On the other hand, other researchers, notably, Noor *et al.* (2009) referred to data collected from course learning outcome surveys as indirect evidence and assessment results as direct evidence that can be used to review and improve a course.

Given that closing the loop is an important component in OBE & SCL, the researchers embarked on a study to quantitatively measure the volume of learning achieved at the end of the BEL 413 course by the 30 second semester Bachelor of Dentistry undergraduates during the July – November 2010 semester. The main objective of this study was to ascertain whether the students' perception of their mastery of the learning outcomes was reflected in their assessment scores as a result of the teaching learning process using the OBE & SCL curriculum. Therefore, it was the aim of the researchers to seek answers to the following research questions.

1. Is there a difference in the students' responses to the Course Entrance Survey and the Course Exit Survey?

2. Is the difference in the students' responses to the Course Entrance and Exit Surveys reflected in their achievement in the four formative on-going assessments?

MATERIALS AND METHOD

Before the start of the course, a Course Entrance Survey and a Course Exit Survey (see Appendix I) were drawn up. All of the items in both surveys were identical except for the titles of the surveys. The survey consisted of the 24 learning outcomes (course content) expressed as what the students can do under the four corresponding course outcomes (what the students are expected to know, understand and can do) at the end of the fourteen-week course. For example, under Course Outcome 1, that is, listen and understand short health-professional –client/colleague interaction, a total of eight learning outcomes were listed as what students can do. An example of one of the learning outcomes is “I can make ‘small talk’ when beginning a conversation/consultation in health related situations” (APB, 2009). For Course Outcome 2, there were also a total of seven learning outcomes. As for Course Outcome 3 and Course Outcome 4, there were a total of seven learning outcomes and two learning outcomes respectively.

In these self-evaluation surveys, the students were expected to respond to the 24 learning outcomes under the four course outcomes based on a 5-point Likert Scale, ranging from Strongly Agree, Agree, Mixed Feelings, Disagree and Strongly Disagree. These self-evaluation surveys were replicated by the researchers from the sample which was provided by the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA (2009).

At the start of the 14-week course beginning July 2010, the 30 second semester students of the Faculty of Dentistry were asked to respond to the Course Entrance Survey to ascertain what they could or could not do. Then, at the end of the course, during the 14th week, the same students were asked to respond to the Course Exit Survey.

To find out if there was a difference between what the students were able to do in terms of the learning outcomes at the start of the course and

what they were able to do as a result of having undergone the Language Enhancement for the Health Sciences (BEL 413) course, their Course Entrance and Course Exit responses were calculated. The mean of each of the 30 students' responses was calculated under each of the four Course Outcomes. For example, for Course Outcome 1, that is, Listen & Understand Short Health Professional-client/colleague Interactions, each student's response to the eight learning outcomes on the 5-point Likert Scale was totalled and divided by eight to get the mean. As for Course Outcome 2, that is, Interact Effectively in a Simulated Hospital Environment, each student's response to the seven learning outcomes on the 5-point Likert Scale was totalled and divided by seven to get the mean. The same procedure was applied for Course Outcome 3 (Comprehend Health-related Texts/Articles) which also consisted of seven learning outcomes. For the final course outcome, that is Course Outcome 4 (Summarise Short Health-related Texts). Since there were only two learning outcomes, each student's response to the leaning outcomes was divided by two to get the mean. This data was then tabulated along with the scores obtained for each of the corresponding on-going assessments for the purpose of conducting statistical analysis (see Appendix II).

A paired sample *t-test* was used to test the difference in the students' responses to the course entrance survey and the course exit survey under each of the four course outcomes. This statistical test was used because the difference in the course exit and entrance responses being examined was from the same group of students. The results of the test are presented and discussed in the subsequent section.

To determine whether the differences in the students' responses in the Course Entrance and Course Exit Surveys were reflected in their achievement in the four formative on-going assessments, a Pearson correlation analysis was done. This is because it was expected that the students who had larger differences in the course entrance and exit responses would perform better in their formative on-going assessments. Hence, the difference in the course entrance and exit responses for each course outcome was correlated with the scores obtained for each of the corresponding on-going assessment. The results of the correlation analysis are presented and discussed in the next section.

The results of the *t-test* and the Pearson correlation analysis are expected to yield valuable data that would show ‘...observable demonstrations of student learning’ (Spady & Marshall, 1994, p.29), indicating what the students know and what they can actually do with what they know. This will help determine if the students have achieved the learning outcomes of the BEL 413 course as a result of classroom instruction/teaching.

RESULTS AND DISCUSSION

In order to answer the first research question, that is, ‘Is there is a significant difference in the students’ responses to the Course Entrance Survey and Course Exit Survey?’, the data were analysed using the paired samples *t-test*. The results from the tests are summarized in Table 1.

Table 1: The difference in students’ responses to the Course Entrance Survey and Course Exit Survey

	Course Exit Response		Course Entrance Response		Difference		<i>t-value</i>	<i>p-value</i>
	Mean	SD	Mean	SD	Mean	SD		
Course Outcome 1	3.94	0.47022	2.95	0.55693	0.99	0.57736	9.392	0.000
Course Outcome 2	4.0933	0.44562	3.31	0.59848	0.7833	0.58609	7.320	0.000
Course Outcome 3	4.0367	0.53851	3.1267	0.5199	0.91	0.58743	8.485	0.000
Course Outcome 4	4.000	0.52523	2.9667	0.68145	1.0333	0.70629	8.930	0.000

*SD = Standard Deviation

As shown in Table 1, the mean course entrance response for all the course outcomes ranges from 2.95 to 3.31 and these responses are consistent as indicated by the small standard deviations. The mean of the course exit responses for all course outcomes is higher than the mean of the course entrance responses ranging from 3.94 to 4.09. There is also consistency in the responses. The difference in the mean exit and mean entrance response is about 1 for Course Outcomes 1, 3 and 4 and 0.8 for Course Outcome 2. The standard deviations which are small indicate consistency in the differences for all course outcomes except for Course Outcome 4 which had a slightly higher standard deviation (0.71).

As such, the results of the paired sample *t-test* show that there is a significant difference in the course exit and entrance response (all *p*-values are 0) for all course outcomes indicating that all course outcomes have been successfully achieved as far as the students' perceptions are concerned.

In order to answer the second research question, that is 'Is the difference in the students' responses to the course entrance and exit surveys reflected in their achievement in the four formative on-going assessments?', a Pearson correlation analysis was done to examine whether the differences in the responses is reflected in their achievement in the four formative assessments. This is because it is generally expected that students who had larger differences in the course exit and entrance responses would perform better in their formative on-going assessments. Hence, the difference in the course exit survey and entrance survey responses for each course outcome was correlated with the scores obtained for each of the corresponding on-going assessments. The results from the correlation analysis are summarized in Table 2.

Table 2: The Differences in Students' Responses to the Course Entrance and Exit Surveys in Relation to their Achievement in the Four Formative Assessments

	Pearson's correlation	<i>p-value</i>
Difference in responses for course outcome 1 and role play grades	0.312	0.093
Difference in responses for course outcome 2 and discussion grades	0.147	0.437
Difference in responses for course outcome 3 and reading and comprehension grades	0.067	0.724
Difference in responses for course outcome 4 and focused summary grades	0.269	0.151

As shown in Table 2, it can be concluded that there is no significant relationship between the difference in the students' responses to the 24 learning outcomes in the course entrance and exit surveys and the grades obtained in the four on-going assessments for all four course outcomes (all *p*-values are above 0.05). It was assumed that since the students had perceived that they had achieved the learning outcomes as a result of the teaching-learning experience (results of the paired sample *t-test*), it was expected that these students would attain higher scores in the corresponding

assessments. However, this is not indicated in the results of the Pearson Correlation Analysis.

In other words, although the students had perceived that they had mastery of the learning outcomes or course content, this is not reflected in their performance in the assessments.

CONCLUSIONS

Through this study to quantitatively measure the volume of learning achieved at the end of the BEL 413 course by the 30 second semester Bachelor of Dentistry undergraduates during the July–November 2010 semester using the OBE & SCL curriculum, two major implications appear to have emerged. The first implication is the suitability of using students' responses in the course entrance and exit surveys to quantitatively measure the volume of learning achieved. Clayson and Kennedy *et al.* (as cited in Kuhn & Rundle-Thiele, 2009) say that students have a tendency to overrate their ability. This statement of caution has implications on the use of student perception surveys to quantitatively gauge the amount of learning that has taken place. Another implication is the purpose of using Course Entrance and Exit Surveys. Kuhn and Rundle-Thiele (2009) suggest in their study that student perception surveys regarding their learning outcomes be used only as an "... interim measurement of student learning during a course term ... to provide insights into the learning goals [learning outcomes] that require further emphasis" (p.358).

In keeping with the suggestion by Kuhn and Rundle-Thiele (2009), future research could look into the administration of course entrance and exit surveys to rule out any possibility of students' perception of their mastery of the learning outcomes not being reflected in their assessment scores as a result of the teaching learning process using the OBE & SCL curriculum.

To this end, researchers propose a new framework for the administration of the course entrance and course exit surveys whereby the surveys are used more as an interim measurement rather than as a cumulative measurement. Under this framework, it is recommended that the course entrance/exit survey be first reorganised into separate surveys, each focusing

on a particular course outcome. For example, for the BEL 413 course, since there are four course outcomes, the main course entrance/exit survey can be reorganised as four separate surveys (each of these consists of a course entrance survey and a course exit survey). During the first week of lectures, the students fill in the course entrance survey for Course Outcome 1, that is, 'Listen and Understand Short Health Professional-Client/Colleague Interactions', which contains eight learning outcomes. Then the learning outcomes are taught for the next four weeks. At the end of the fourth week, the course exit survey for Course Outcome 1 is administered. The teaching professional then compares the students' responses in both the surveys. If the responses indicate that the students have perceived themselves as not having mastered the learning outcomes, then re-teaching is necessary for these students before administering the Role Play Assessment. Another approach for the teaching professional is to identify the learning outcomes that appear not to have been mastered by the entire class and then re-teach the related learning outcomes to the entire class before administering the Role Play Assessment. The same process is repeated for the remaining three course outcomes.

The advantage of following the procedure set out in the proposed framework for the administration of course entrance and exit surveys is that the teaching professional will be able to first determine whether students are ready to be assessed. In the event that the perception of students regarding their mastery of learning outcomes is low, the teaching professional can re-teach the related learning outcome before administering the assessment. This would ensure that each of the learning outcomes is mastered before being assessed. To conclude, the use of course entrance and exit surveys as interim measurements of students' perception of their mastery of learning outcomes could be more effective than the use of these surveys as cumulative measurements.

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APPENDIX I

**FACULTY OF DENTISTRY
BACHELOR IN OF DENTAL SURGERY (DS 220)
COURSE ENTRANCE SURVEY**

LANGUAGE ENHANCEMENT FOR THE HEALTH SCIENCES (BEL 413)

NAME: _____

STUDENT NO : _____

DATE : _____

Please complete this inventory by circling the appropriate ratings:

5 - Strongly Agree

4 - Agree

3 - Mixed Feelings (note: most of the time, you would have a stronger feeling)

2 - Disagree

1 - Strongly Disagree

CO	NO.	ITEMS	YOUR RATING				
CO1	1	I can make 'small talk' when beginning a conversation/consultation in health related situations.	5	4	3	2	1
	2	I can apply the correct techniques to health-related interpersonal communication.	5	4	3	2	1
	3	I can ask affirmative, negative and WH questions to elicit information in health related situations.	5	4	3	2	1
	4	I can answer questions by explaining and giving feedback in health related situations.	5	4	3	2	1
	5	I can explain and give feedback in health-related situations.	5	4	3	2	1
	6	I can apply the right social conventions for communicating in different health-related situations.	5	4	3	2	1
	7	I can carry out a dialogue on health-related situations.	5	4	3	2	1
	8	I can interact with a partner as either a health professional, colleague or client.	5	4	3	2	1

CO2	1	I can listen and understand information discussed by group members on a health-related topic.	5	4	3	2	1
	2	I can interact effectively with group members during the discussion on a health-related topic.	5	4	3	2	1
	3	I can present information / points of view during health-related discussions.	5	4	3	2	1
	4	I can accept/reject ideas with justifications during health-related discussions.	5	4	3	2	1
	5	I can justify ideas and draw conclusions during health-related discussions.	5	4	3	2	1
	6	I can listen and understand information discussed by group members on a health-related topic.	5	4	3	2	1
	7	I can interact effectively with group members during the discussion on health-related topic.	5	4	3	2	1
CO3	1	I can identify main ideas and supporting details in a health-related passage or paragraph.	5	4	3	2	1
	2	I can write main ideas of paragraphs in a health-related passage.	5	4	3	2	1
	3	I can derive meaning of health-related words based on contextual clues.	5	4	3	2	1
	4	I can list/categorise information in a health-related passage.	5	4	3	2	1
	5	I can evaluate and draw conclusions based on information in a health-related passage.	5	4	3	2	1
	6	I can justify ideas and draw conclusions from a health-related passage.	5	4	3	2	1
	7	I can read a health-related passage and answer reading comprehension questions.	5	4	3	2	1
CO4	1	I can list main ideas in a health-related passage.	5	4	3	2	1
	2	I can write a focused summary based on the list of main ideas in a health-related passage.	5	4	3	2	1

This inventory has been replicated by Associate Professor Theyy Rajaretnam (Resource Person for BEL 413, Academy of Language Studies) from the sample kindly provided by the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA © 2009. July 2010

**FACULTY OF DENTISTRY
 BACHELOR IN OF DENTAL SURGERY (DS 220)
 COURSE EXIT SURVEY
 LANGUAGE ENHANCEMENT FOR THE HEALTH SCIENCES (BEL 413)**

NAME: _____

STUDENT NO : _____

DATE : _____

Please complete this inventory by circling the appropriate ratings:

5 - Strongly Agree

4 - Agree

3 - Mixed Feelings (note: most of the time, you would have a stronger feeling)

2 - Disagree

1 - Strongly Disagree

CO	NO.	ITEMS	YOUR RATING				
			5	4	3	2	1
CO1	1	I can make 'small talk' when beginning a conversation/consultation in health related situations.	5	4	3	2	1
	2	I can apply the correct techniques to health-related interpersonal communication.	5	4	3	2	1
	3	I can ask affirmative, negative and WH questions to elicit information in health related situations.	5	4	3	2	1
	4	I can answer questions by explaining and giving feedback in health related situations.	5	4	3	2	1
	5	I can explain and give feedback in health-related situations.	5	4	3	2	1
	6	I can apply the right social conventions for communicating in different health-related situations.	5	4	3	2	1
	7	I can carry out a dialogue on health-related situations.	5	4	3	2	1
	8	I can interact with a partner as either a health professional, colleague or client.	5	4	3	2	1

CO2	1	I can listen and understand information discussed by group members on a health-related topic.	5	4	3	2	1
	2	I can interact effectively with group members during the discussion on a health-related topic.	5	4	3	2	1
	3	I can present information / points of view during health-related discussions.	5	4	3	2	1
	4	I can accept/reject ideas with justifications during health-related discussions.	5	4	3	2	1
	5	I can justify ideas and draw conclusions during health-related discussions.	5	4	3	2	1
	6	I can listen and understand information discussed by group members on a health-related topic.	5	4	3	2	1
	7	I can interact effectively with group members during the discussion on health-related topic.	5	4	3	2	1
CO3	1	I can identify main ideas and supporting details in a health-related passage or paragraph.	5	4	3	2	1
	2	I can write main ideas of paragraphs in a health-related passage.	5	4	3	2	1
	3	I can derive meaning of health-related words based on contextual clues.	5	4	3	2	1
	4	I can list/categorise information in a health-related passage.	5	4	3	2	1
	5	I can evaluate and draw conclusions based on information in a health-related passage.	5	4	3	2	1
	6	I can justify ideas and draw conclusions from a health-related passage.	5	4	3	2	1
	7	I can read a health-related passage and answer reading comprehension questions.	5	4	3	2	1
CO4	1	I can list main ideas in a health-related passage.	5	4	3	2	1
	2	I can write a focused summary based on the list of main ideas in a health-related passage.	5	4	3	2	1

This inventory has been replicated by Associate Professor Theyy Rajaretnam (Resource Person for BEL 413, Academy of Language Studies) from the sample kindly provided by the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA © 2009. July 2010

APPENDIX II

COMPARISON OF STUDENTS' RESPONSES IN THE COURSE ENTRANCE SURVEY AND THE COURSE EXIT SURVEY WITH THEIR ON-GOING ASSESSMENT SCORES
COURSE OUTCOME 1: LISTEN & UNDERSTAND SHORT HEALTH PROFESSIONAL-CLIENT/COLLEAGUE INTERACTIONS (Average calculated from their responses to 8 learning outcomes)

Student	COURSE ENTRANCE RESPONSE (MEAN)	COURSE EXIT RESPONSE (MEAN)	DIFFERENCE	SCORE ROLE PLAY (20%)
1	2.1	3.4	1.3	14
2	2.6	3.9	1.3	17.5
3	3.0	3.6	0.6	11.5
4	2.4	4.1	1.7	17.5
5	3.3	4.0	0.7	18
6	3.0	3.8	0.8	17
7	3.1	3.3	0.2	13
8	2.9	4.3	1.4	15.5
9	3.4	4.1	1.0	18
10	3.0	3.5	0.5	13.5
11	3.1	4.0	0.9	14.5
12	2.0	3.9	1.9	14.5
13	2.4	4.0	1.6	14
14	3.1	4.0	0.9	14.5
15	3.3	4.0	0.7	17
16	2.5	4.0	1.5	16.5
17	3.1	5.0	1.9	17.5
18	2.5	3.4	0.9	14.5
19	1.6	3.5	1.9	14
20	3.1	4.4	1.3	17.5
21	2.8	4.0	1.2	12
22	2.6	2.6	0.0	13
23	3.5	3.8	0.3	15
24	3.9	4.6	0.7	10.5
25	3.6	4.9	1.3	18.5
26	3.1	4.0	0.9	17.5
27	3.8	4.1	0.3	14.5
28	3.5	3.8	0.3	15.5
29	2.4	4.3	1.9	17.5
30	3.8	3.9	0.1	16

**COURSE OUTCOME 2: INTERACT EFFECTIVELY IN A
SIMULATED HOSPITAL ENVIRONMENT**
(Average calculated from the responses to 7 learning outcomes)

Student	COURSE ENTRANCE RESPONSE (MEAN)	COURSE EXIT RESPONSE (MEAN)	DIFFERENCE	SCORE DISCUSSION (20%)
1	2.6	3.9	1.3	15
2	3.3	4.4	1.0	18
3	2.6	3.7	1.1	13
4	3.4	4.0	0.6	18
5	3.9	4.0	0.1	10
6	4.0	4.3	0.3	15
7	3.3	3.4	0.1	15
8	3.1	4.8	1.7	15
9	3.7	4.6	0.9	10
10	3.0	3.7	0.7	16
11	3.7	4.0	0.3	13
12	2.6	4.0	1.4	18
13	3.1	4.0	0.9	16
14	3.1	4.0	0.9	16
15	3.9	4.0	0.1	15
16	3.2	4.0	0.8	10
17	3.4	5.0	1.6	18
18	4.0	4.3	0.3	16
19	1.4	3.7	2.3	12
20	3.7	4.3	0.6	10
21	2.6	3.4	0.8	13
22	2.6	3.1	0.3	9
23	3.7	4.0	0.3	13
24	4.0	4.0	0.0	18
25	3.6	4.9	1.3	18
26	3.3	4.0	0.7	12
27	3.3	4.0	0.7	16
28	4.0	4.0	0.0	13
29	3.1	4.9	1.8	13
30	4.1	4.4	0.3	13

COURSE OUTCOME 3: COMPREHEND HEALTH-RELATED TEXTS/ARTICLES

(Average calculated from their responses to 7 learning outcomes)

Student	COURSE ENTRANCE RESPONSE (MEAN)	COURSE EXIT RESPONSE (MEAN)	DIFFERENCE	SCORE READING COMPREHENSION (30%)
1	2.1	3.7	1.6	23.5
2	3.7	4.0	0.3	27
3	2.4	3.9	1.5	23.5
4	3.1	3.9	0.8	26.5
5	3.6	4.3	0.7	24.5
6	3.1	4.1	1.0	23.5
7	3.0	3.4	0.4	22
8	3.0	4.6	1.6	23.5
9	3.4	4.7	1.3	24.5
10	3.0	3.7	0.7	15.5
11	3.3	4.0	0.7	21
12	3.0	4.0	1.0	26.5
13	3.9	4.0	0.1	16.5
14	3.1	4.0	0.9	26
15	3.0	4.0	1.0	24
16	3.1	4.0	0.9	24
17	3.0	5.0	2.0	23.5
18	2.9	3.4	0.5	25
19	1.6	3.6	2.0	19.5
20	3.4	5.5	1.6	21
21	3.0	4.0	1.0	22
22	2.4	2.7	0.3	23
23	3.6	3.4	0.1	22
24	4.0	4.1	0.1	23.5
25	3.4	4.3	0.9	24.5
26	2.7	4.0	1.3	23
27	3.3	3.9	0.3	22.5
28	3.6	3.9	0.3	23
29	3.7	5.0	1.3	24
30	3.4	4.0	0.6	21

COURSE OUTCOME 4: SUMMARISE SHORT HEALTH-RELATED TEXTS

(Average calculated from their responses to 2 learning outcomes)

Student	COURSE ENTRANCE RESPONSE (MEAN)	COURSE EXIT RESPONSE (MEAN)	DIFFERENCE	SCORE FOCUSED SUMMARY (20%)
1	2.0	3.5	1.5	18
2	3.0	4.0	1.0	12
3	2.0	4.0	2.0	12
4	2.5	4.0	1.5	14
5	4.0	4.5	0.5	13.5
6	4.0	5.0	1.0	15
7	2.5	3.5	1.0	16
8	2.5	4.0	1.5	14
9	3.5	4.0	0.5	14
10	3.0	3.0	0.0	12
11	3.5	4.0	0.5	12
12	3.0	4.0	1.0	14.5
13	2.5	4.0	1.5	12
14	4.0	4.0	0.0	11
15	3.0	4.0	1.0	10.5
16	3.0	4.0	1.0	11
17	3.0	5.0	2.0	14
18	2.5	3.5	1.0	12.5
19	1.5	3.5	2.0	14
20	3.0	5.0	2.0	14
21	4.0	3.5	0.5	13
22	2.0	3.0	1.0	15
23	3.0	4.0	1.0	10.5
24	3.5	4.5	1.0	13.5
25	3.0	4.0	1.0	14
26	3.0	4.0	1.0	13
27	3.5	4.0	0.5	13
28	4.0	3.5	0.5	15
29	3.0	5.0	2.0	14
30	2.0	4.0	2.0	14