ORIGINAL ARTICLE

تأثير انتخاب أسلوب التقييم في رؤية المطالعه و التعلم: هل يجب تغيير أسلوب التقييم

التمهيد و الهدف : كيفيه المطالعه للاختبارات لها اهميه بالغه : إن الهدف من هذه الدراسه هو تبيين هل اختيار اسلوب التقييم له تأثير دوقيمه على رؤية المطالعه و التعلم عند الطلاب.

الأسلوب : تمت هذه الدراسه على ١٩١ من طلبه السنه الاولى من ثلاث كليات تمريض خلال فصلين عبر اسلوب توصيفى – تحليلى. تم اخذ اختبار نصف فصلى و فصلى من جميع الطلاب و كان نصف الاسئله ذو اربعه اجوبه (MCQ) و نصف الاسئله ذو جواب قصير (SAQ) و تم تعيين استماره محققه ذو ١٢ مورد على معيار ٥ اجوبه ليكرت و قد صممت على معيار الفا كرونباخ ٠.٨١٤ .

النتائج: كان هناك اقبال واضح من جهه الطلاب الى اسلوب الاسئله ذو اجوبه قصيره مقابل الاسئله ذو اربعه اجوبه كان هناك اختلاف واضح بين الذكور و الإناث حيث ان علامه الإناث كانت افضل اختبار اسئله ذو اجوبه قصيره و اسئله ذو اربعه اجوبه و العلامه الكليه على الترتيب التالى (PV=0.030,PV=0.000,PV=0.001). لم يكن هناك اختلاف واضح بين رؤية المطالعه و التعلم فى الاستماره بين العلامات المتدنيه و العاليه من حيث النمو الدراسى و اشارت الدراسه ايضاً الى إن الطلاب رجحوا اسلوب الاسئله ذو اجوبه قصيره.

الإستنتاج: إذن الدراسه الحاليه تشير الى أن اساليب التقييم من الممكن ان تحسن رؤية المطالعه و التعلم عند الطلاب مع افتراض ان الاسئله ذو اجوبه قصيره تزيد فى عمق التعلم.

الكلمات الرئيسيه: التقييم، رؤية المطالعه و التعلم، الاسئله ذو اربعه اجوبه، الاسئله ذو اجوبه قصيره.

مطالعے اور پڑھائي پر تجزياتی روشوں کا اثر، کيا تجزياتی روشوں کو تبديل کرنا ضروری ہے

بيک گراونڈ: مختلف امتحانوں کے لئے مطالعے کی روشوں کی نہايت اہميت ہوتی ہے۔ اس تحقيق کا مقصد يہ جاننا ہے کہ کيا تجزياتی روشوں سے مطالعے اور پڑھائي پر اثر پڑتا ہے۔

روش: اس تحقيق ميں نرسنگ کے پہلے برس کے ايک سو اکانوے طلباء نے شرکت کی تھی جس کا تعلق تين الگ الگ کالجوں سے تھا۔ يہ تحقيق ٹرم کے وسط ميں اور آخر ميں انجام دی گئي۔ اس کےلئے آبجيکٹيو سوالات اور مختصر جوابات کے سوالات بنائے گئے تھے۔ مجموعی طور پر بارہ سوالات تھے۔ يہ سوالات پانچ نکاتی لائيکرٹ اسکيل اور کرونباخ آٹھ سو چودہ اينالوگ کے مطابق بنائے گئے تھے۔

نتيجے: اس تحقيق ميں طلباء نے آبجيکٹيو سوالات کے مقابلے ميں مختصر جوابات کے سوالوں کا بہتر جواب ديا تھا۔ اس تحقيق ميں طالبات نے لڑکوں سے بہتر کارکردگي کا ثبوت ديا۔ بيشتر طلباء نے مختصر جواب کی روش کو پسند کيا۔

سفارشات: اس تحقيق سے پتہ چلتا ہےکہ تجزياتی روش سے طلباء کے مطالعے اور پڑھائي پر مفيد اثرات پڑتے ہيں۔

کليدی الفاظ: تجزياتی روش، مطالعہ، مختصر جوابات۔

Influence of Assessment Method Selection in Studying and Learning Approaches: Is It Necessary to Change Assessment Style?

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Background: It is important to learn how to study for different examinations. The objective of the current study is to explore whether the assessment method selection would significantly affect the studying and learning approaches of students.

Methods: This descriptive-analytical research consisted of 191 first-year undergraduate nursing students from three nursing schools and was conducted during two interval semesters. All of students were given examinations with half of multiple-choice questions (MCQs) and half of short-answer questions (SAQs) in mid and final term examinations. A structured 12-item questionnaire was designed based on a modified 5-point Likert scale in outline of visual analogue scale. The questionnaire with Cronbach's alpha of at 0.814 sought information on student's studying and learning approaches.

Results: The students significantly rated agreement with queries of short-answer assessment part of questionnaire higher than in multiple-choice assessment part. Female students performed significantly better in the learning outcomes in SAQ and MCQ examinations grades and total grade of both examinations than male students who participated in the study (p= 0.001, 0.001 and 0.030, respectively). Neither lower-quartile nor higher-quartile of education promotion exposed significance difference on total score of studying and learning approaches questionnaires. Responses frequency to studying and learning approaches questionnaire revealed that most students selected short-answer assessment method.

Conclusion: Therefore, the findings revealed that assessment method may shape and improve students' studying and learning approaches. Short answer question is hypothesized to enhance the development of deep learning.

Key words: Assessment, Studying and learning approach, Multiple-choice Question, Short-Answer Question

تأثير انتخاب روش ارزشيابی در رويکردهای مطالعه و يادگيری: آيا تغيير سبک ارزشيابی لازم است؟

زمينه و هدف: چگونگی مطالعه برای آزمون های مختلف اهميت دارد. هدف از مطالعه حاضر بررسی اينکه آيا انتخاب روش ارزشيابی تأثير معنی داری بر رويکردهای مطالعه و يادگيری دانشجويان می گذارد.

روش : اين مطالعه متشکل از ۱۹۱ دانشجوی کارشناسی پرستاری سال اول که در سه دانشکده پرستاری مشغول به تحصيل بودند در طول دو ترم متناوب به روش توصيفی–تحليلی انجام شد. از تمامی دانشجويان آزمون ميان ترم و پايان ترم با نيمی از سوالات چند گزينه ای (MCQ) و نيمی از سوالات کوتاه پاسخ (SAQ) گرفته شد. يک پرسشنامه ساختارمند ۱۲ موردی محقق ساخته که براساس معيار ۵ گزينه ای ليکرت که بصورت معيار آنالوگ بصری با آلفای کرونباخ ۰/۸۱۴ طراحی شده بود، اطلاعات را در مورد رويکردهای مطالعه و يادگيری دانشجويان بررسی کرد.

يافته‌ها: دانشجويان در بخش ارزشيابی کوتاه پاسخ پرسشنامه در مقايسه با بخش ارزشيابی سوالات چند گزينه ای بطور معنی داری موافق بودند. دانشجويان دختر در مقايسه با دانشجويان پسر بطور معنی داری پيامدهای يادگيری بهتری در آزمون کوتاه پاسخ، چند گزينه ای و کل نمره کسب شده داشتند (بترتيب pv=0.001 ، pv=0.000 و pv=0.030). اختلاف معنی داری در امتياز کل رويکردهای مطالعه و يادگيری پرسشنامه بين کوارتايل پايين و بالای نمره پيشرفت تحصيلی مشاهده نشد. بسامد پاسخ ها به رويکردهای مطالعه و يادگيری پرسشنامه نشان داد که اغلب دانشجويان روش ارزشيابی کوتاه پاسخ را انتخاب کردند.

نتيجه‌گيری: بنابراين، يافته های مطالعه حاضر نشان می دهد که روش ارزشيابی ممکن است رويکردهای مطالعه و يادگيری دانشجويان را شکل داده و بهبود دهند. با فرض اينکه سوالات کوتاه پاسخ، توسعه يادگيری عميق را افزايش می دهد.

واژه‌های کليدی: ارزشيابی، رويکرد مطالعه و يادگيری، سوالات چند گزينه ای، سوالات کوتاه پاسخ.

INTRODUCTION

In education, examinations are almost exclusively used as assessment tools, thus teachers assess the efficacy of their curriculum and students' learning outcomes in the course to assign grades (1).

Currently, medical school examinations comprise a range of different assessments, both written and performance-based, offering an opportunity to compare performance on different formats (2). The multiple-choice question (MCQ) type of tests is commonly used in assessment of medical knowledge acquisition (3). Objective testing, specifically MCQ is one of the approaches that may diversify the assessment approach in education. Significant commitment is required to prepare MCQ test items and examination formats that are reliable and consistent with curriculum objectives. Appropriately constructed MCQ examinations are efficient, objective, and capable of discrimination and can be combined with other assessment strategies to contribute to a comprehensive student assessment strategy for use in nursing education (4). Therefore, the MCQ examination is not a completely transparent examination tool and is supplemented by short-answer question (SAQ). However, since it is relatively cheap, easy to standardize and rapidly generates an objective score, it is still used to assess (5). Assessment is the process by which the teacher and the student gain knowledge about student progress. Assessment systems should aim at evaluating the desired learning outcomes. It was also demonstrated that a single assessment does not fulfill all aspects of assessment and that there is a need for an evaluating system with multiple ways of assessment (6). In another study, Rassaian showed that the most valid assessment tool was the SAQs. She concluded that it is recommended to use SAQs and true-false questions as the main components of examination, instead of MCQ alone, (7).

Tests that require effortful retrieval of information, such as short-answer tests, promote better retention and greatest gains in memory than tests that require recognition, such as multiple-choice tests (8,9). Therefore, tests can also directly affect learning by promoting better retention of information, a phenomenon known as the testing effect (10). Examination style may enhance study and learning approaches in students (11). Then, studying is different for different types of tests. It is important to learn how to study for multiple choice, true/false, short answer, and essay tests (12).

The purpose of the study is to explore whether the assessment method selection would significantly affect the studying and learning approaches of undergraduate nursing students based on comparing MCQ and SAQ examination scores.

METHODS

This study was designed as a descriptive-analytical research. The study has been conducted according to the declaration of Helsinki. One hundred and ninety one first-year undergraduate nursing students enrolled in the study. Students have given the informed consent. The project was conducted in Mother School (Kerman Nursing) and two pertaining nursing schools (Zarand Nursing and Bam Nursing Schools) and was composed of two separate second-semester student groups. This course has two credits with defined curriculum that have provided 34 hours of didactic lectures. In our study, the course relied primarily on lecture-based teaching with power point presentation and the main form of assessment used in the curriculum was MCQ and SAQ examinations. All of students were given mid and final term examinations with half of MCQs and half of SAQs, consecutively. The composite mid-term examination consists of a 10 multiple-choice questions paper and 10 SAQs paper and final-term examination consists of a 15 MCQs paper and 15 SAQs paper. The students were required to answer two examination papers separately for mid and final-term.

At the end of the final course examination, two structured questionnaires were distributed to ask the students to rank the two different assessment methods based on their preference. Apart from first structured questionnaire that composed of the demographic and academic characteristics of each nursing student, the second questionnaire sought information on student's studying and learning approaches that may affect the student's learning outcome.

The second structured 12-item questionnaire (MASLAQ) (13) designed based on a modified 5-point Likert scale in outline of visual analogue scale to ask students' studying and learning approaches. In our study, visual analogue scale including a horizontal line which was divided to two equal parts by a zero point. Choices of each query based on 5-point Likert scale were located on two equal parts of line that joint through a zero point. Each part of line related to an assessment method. On the Likert scale (1 = strongly disagree, 4 = strongly agree and 0= no difference), MCQ examination separate from SAQ examination was marked. To answer to each query of the second 12-item questionnaire, according to students' personal viewpoint, students were then allowed place a mark on only one of square of related below line on the scale from 0 to 4 for only one exam.

Face validity of 12-item questionnaire was confirmed appropriate. One-week test-retest reliability of the 12-item questionnaire was measured by Cronbach's alpha at 0.81 and 0.81, respectively. Reliability of the validated 12-item questionnaire was measured by Cronbach's alpha at 0.77 (13). Range of agreement coefficient of kappa and Pearson's correlation between pre and post-test questionnaire queries were computed in another article (13).

Statistical analysis was done with the Chi-square test, independent t-test, one way analysis of variance and ANCOVA. SPSS 16.0 was used for statistical analysis and $p < 0.05$ was considered significant.

RESULTS

Male students comprised 36.7% of the total participants. Mean (SD) admittance age to university for male and female students was 19.68 ± 3.26 and 19.06 ± 2.14 years, respectively. Baseline characteristics of nursing students according to schools are shown in Table 1.

There was a response rate of 99 percent for completing second questionnaire (189/191). Generally, students favorably

and significantly rated the queries of questionnaire on SAQ assessment part higher than in MCQ assessment part. In order to avoidance of confusing and more precise interpretation of collected data from second questionnaires, a shift is necessary from an assessment method to another method. Then, MCQ assessment's viewpoints were accurately converted to SAQ assessment's viewpoints. Subsequently, the scores of strongly disagree, disagree, agree, and strongly agree for multiple-choice option modified to strongly agree, agree, disagree, and strongly disagree short-answer option. Table 2 shows overview frequency of nursing students' scores for SAQ assessment. With integration of disagree and strongly disagree under one item and integration of agree and strongly agree under another item, analytical analysis allowed us to interpret and deduce agreement between two assessment methods (Table 3).

Female students who participated in the study performed significantly better in the learning outcomes in SAQ and MCQ examinations grades and the total grade of both examinations was better than male students who participated in the study ($p = 0.001$, 0.001 and 0.030, respectively) (Table 4). Table 5 shows responses frequency to studying and learning approaches questionnaire according to lowest and highest quartiles of students' MCQ and SAQ marks. Most students selected short-answer assessment method with attention to majority queries.

1. Motivation for more profound course study, 2. More time-consuming study for answering to examination, 3. More expanded study for answering to examination, 4. Better and more profound understanding of course meanings, 5. Thinking, deliberation, interpretation and analysis of knowledge in learning process, 6. Capability of retrieval of knowledge in future7. Appropriate evaluation method for nutrition course, 8. Appropriate evaluation method for knowledge level, 9. Appropriate evaluation

Table 1. Baseline characteristics of nursing students according to schools

Variables	Kerman School	Zarand School	Bam School	P value
No of participations	91 (%47.6)	44 (%23.0)	56 (%29.3)	
Male sex	34 (%37.4)	14 (%31.8)	22 (%39.3)	
Admittance age to University	19.6 ± 3.6	18.9 ± 1.1	19.0 ± 1.0	0.244
Place of residency				
with Family	38 (%41.8)	4 (%9.1)	7 (%12.5)	
Dormitory	52 (%57.1)	27 (%61.4)	49 (%87.5)	0.000
Rental house	1 (%1.1)	13 (%29.5)	0 (%0.0)	
Admission allocation				
Aborigine & non-aborigine	79 (%86.8)	44 (%100.0)	53 (%94.6)	0.02
Previous semester GPA				
Male	15.27 ± 1.55	15.56 ± 0.92	14.16 ± 1.38	0.005
Female	15.33 ± 1.25	16.37 ± 1.00	15.38 ± 1.40	0.001
Current semester GPA				
Male	15.28 ± 1.50	15.87 ± 1.39	14.67 ± 1.70	0.076
Female	16.08 ± 1.07	17.20 ± 1.22	16.65 ± 1.87	0.002
Nutrition examination mark				
Male	13.61 ± 3.01	14.59 ± 2.30	12.94 ± 2.18	0.196
Female	14.42 ± 2.45	15.88 ± 1.97	14.64 ± 2.72	0.027
Short-answer assessment mark				
Male	6.77 ± 1.71	6.99 ± 1.65	6.15 ± 1.46	0.245
Female	7.33 ± 1.50	7.92 ± 1.15	7.27 ± 1.80	0.161
Multiple-choice assessment mark				
Male	6.84 ± 1.51	7.61 ± 0.98	6.80 ± 0.95	0.121
Female	7.09 ± 1.21	7.96 ± 1.02	7.37 ± 1.19	0.005

Table 2. Overview frequency of nursing students when multiple-choice questions scores shifted to short-answer questions scores (Modified data)

Queries	Short Answer Question				
	No Difference	Strongly Disagree	Disagree	Agree	Strongly Agree
Motivation for more profound course study	15 (7.9)	42 (22.0)	33 (17.3)	47 (24.6)	54 (28.3)
More time-consuming study for answering to examination	12 (6.3)	11 (5.8)	30 (15.7)	58 (30.4)	80 (41.9)
More expanded study for answering to examination	21 (11.0)	26 (13.6)	43 (22.5)	54 (28.3)	47 (24.6)
Better and more profound understanding of course meanings	13 (6.8)	38 (19.9)	28 (14.7)	46 (24.1)	66 (34.6)
Thinking, deliberation, interpretation and analysis of knowledge in learning process	12 (6.3)	51 (26.7)	28 (14.7)	50 (26.2)	50 (26.2)
Capability of retrieval of knowledge in future	16 (8.4)	32 (16.8)	27 (14.1)	67 (35.1)	47 (24.6)
Appropriate evaluation method for nutrition course	25 (13.1)	42 (22.0)	45 (23.6)	37 (19.4)	40 (20.9)
Appropriate evaluation method for knowledge level	17 (8.9)	32 (16.8)	42 (22.0)	57 (29.8)	41 (21.5)
Appropriate evaluation method for other theoretical courses	28 (14.7)	38 (19.9)	57 (29.8)	37 (19.4)	29 (15.2)
Acquisition of higher grade in examination	15 (7.9)	78 (40.8)	38 (19.9)	26 (13.6)	32 (16.8)
High validity in acquired grade in examination	21 (11.0)	26 (13.6)	23 (12.0)	46 (24.1)	73 (38.2)
High satisfaction with examination	18 (9.4)	73 (38.2)	47 (24.6)	24 (12.6)	27 (14.1)

Table 3: Overview frequency of nursing students when multiple-choice questions scores shifted to short-answer questions scores with merging two items (Modified data)

Query	Disagree & Strongly Disagree	Agree & Strongly Agree	Sig.
1	75 (39.3)	101 (52.9)	0.05
2	41 (21.5)	138 (72.5)	0.000
3	69 (36.1)	101 (52.9)	0.014
4	66 (34.6)	112 (58.6)	0.001
5	79 (41.4)	100 (52.4)	0.117
6	59 (30.9)	114 (59.7)	0.000
7	87 (45.5)	77 (40.3)	0.435
8	74 (38.7)	98 (51.3)	0.067
9	95 (49.7)	66 (34.6)	0.022
10	116 (60.7)	58 (30.4)	0.000
11	49 (25.7)	119 (62.3)	0.000
12	120 (62.8)	51 (26.7)	0.000

method for other theoretical courses, 10. Acquisition of higher grade in examination, 11. High validity in acquired grade in examination, 12. High satisfaction with examination

DISCUSSION

There was an emphasis on many curriculums on student acquisition of knowledge and this was reinforced by the use of theoretical examinations such as integrating MCQ and SAQ examinations (14). In our study, it is obvious that female students performed significantly better in the learning outcomes, generally. Nonetheless, our first question was whether the change of the assessment type influences students' learning outcomes and students' studying and learning approaches and whether we can analyze learning levels.

The findings allowed us to interpret and deduce agreement between two assessment methods (Table 3). With exception of four queries, students mostly agreed with SAQ than MCQ. In a research, the medical students' perspective regarding three assessment methods revealed that structured short answer assessment was regarded as the preferred modality and the MCQ was the least favored assessment method. Formative assessment is a potentially powerful method to direct learning behavior (15). Southwick et al. indicated that MCQ type's disadvantages are low expectations for students, encouraging short-term memory and discouraging understanding and long-term memory. These methods also fail to stimulate active participation, collaborative learning, and two-way communication with the professor, and they do not respect the students' diverse talents and ways of learning (11). Although, the MCQ type of tests are commonly used in assessment of knowledge acquisition due to reliability, validity, relatively cheap, easy to standardize, cost-effectively and rapidly generates an objective score in assessing medical knowledge (3-5). Tests only MCQs are often inadequate to assess knowledge acquisition and may encourage students to memorize abstract textbook knowledge (16). Indeed, when students responding to both SAQs and MCQs, are able to assess the likelihood of answering questions correctly on a moment-by-moment basis, even though they are not able to generate an accurate self-assessment of overall performance on the test (17). An investigation demonstrated that the utilization of examinations containing SAQs created a more

Table 4: Assessment (Examination & Questionnaire) outcomes of nursing students

variables	Male	Female	Sig.
Nutrition examination mark	13.60 ± 2.67	14.84 ± 2.48	0.001
Short answer mark	6.62 ± 1.63	7.46 ± 1.53	0.000
Multiple choice mark	6.98 ± 1.28	7.38 ± 1.20	0.030
P value	0.017	0.486	
Questionnaire scores	19.6 ± 3.6	19.6 ± 3.6	0.467

Table 5. Responses frequency to studying and learning approaches questionnaire according to quartiles of students' multiple-choice and short-answer marks

	Multiple-Choice Test Mark						Short-Answer Test Mark					
	Lowest Quartile			Highest Quartile			Lowest Quartile			Highest Quartile		
	Disagree & Strongly Disagree	Agree & Strongly Agree	Sig.	Disagree & Strongly Disagree	Agree & Strongly Agree	Sig.	Disagree & Strongly Disagree	Agree & Strongly Agree	Sig.	Disagree & Strongly Disagree	Agree & Strongly Agree	Sig.
1	21	34	0.080	18	24	0.355	22	23	0.881	18	24	0.355
2	13	41	0.000	7	38	0.000	13	31	0.007	10	36	0.000
3	22	27	0.475	12	30	0.005	17	27	0.132	14	29	0.022
4	17	40	0.002	15	28	0.047	18	29	0.109	15	30	0.025
5	24	31	0.345	19	26	0.297	22	24	0.768	18	25	0.286
6	16	34	0.011	16	27	0.093	13	30	0.010	16	27	0.093
7	25	25	1.000	22	18	0.527	24	19	0.446	20	17	0.622
8	20	35	0.043	15	26	0.086	19	26	0.297	14	26	0.058
9	26	22	0.564	23	18	0.435	22	18	0.527	24	14	0.105
10	38	15	0.002	28	14	0.031	34	11	0.001	22	17	0.423
11	17	36	0.009	9	35	0.000	16	27	0.093	11	32	0.001
12	39	14	0.001	32	9	0.000	35	10	0.000	26	15	0.086

challenging learning environment that motivated students to adopt more effective study. The class given examinations with half SAQs along with half MCQs had a significantly higher average score and grade category distribution than the class given examinations with all MCQs or with all SAQs (18). In our research, there is not noteworthy difference between SAQ and MCQ exam mean scores. It is possible; having information about assessment method is an important ingredient of an individual's preparation for the examination. Then, it can be said that a major element of students' preparation depends on their previous conception of the assessment method. This is one of two reasons lack of remarkable difference between SAQ and MCQ exam mean scores. The findings of McKendree and Snowling supported the current view that a variety of assessment types should be included in the assessment of all medical students, as is already considered to be best practice (2). Rassaian, after analyzing students' score and excluding questions with a discrimination index of less than 0.3, showed that the most valid assessment tool was the short-answer questions (7). Furthermore, an initial short-answer test produced greater gains on a final test than did an initial multiple-choice test (8). Therefore, Combination PowerPoint lectures and notes with MCQs assessment may have encouraged absent long-term retention or the loss of memory of facts taught during year. Essays and SAQs were combined with MCQs to encourage understanding and recall (19). In one study, students did more poorly on the multiple choice

examination than on the short answer survey (20). In another study, from six commonly used methods in the model, the highest score identifies the most appropriate method. The objective structured clinical examination was preferred, and the essay and short-answer-question examinations were best (21).

The findings of the present study shows the selection of SAQ assessment method in compare with MCQ assessment method by professor results in significant modification of students' learning approaches such as motivation for more profound course study, more time-consuming study for answering to examination, more expanded study for answering to examination, better and more profound understanding of course meanings, capability of retrieval of knowledge in future, and high validity in acquired grade in examination. These approaches represent deep learning of students. Short answer question is hypothesized to enhance the development of deep learning. Student disagreement for SAQ assessment method correspond to selecting learning approaches such as appropriate evaluation method for nutrition course, appropriate evaluation method for other theoretical courses, acquisition of higher grade in examination, and high satisfaction with examination. These approaches represent surface learning of students. In our study, assessment preference is defined as imagined choice between assessment alternatives. Higher viewpoint frequencies in MCQ assessment for theoretical courses as one of assessment method are convenience and simplicity.

In a study, authors reported that students have more positive attitudes towards multiple choice tests in comparison to free response tests because they think that these tests are easier to prepare for, easier to take, and thus will bring in relatively higher scores (22). Viewpoint of 6.3-14.7% students was "no difference" for queries of questionnaire means that learning level of some students is strategic. It is interesting that in our research, students with strategic or deep learning had the higher grades mean in SAQs than those with surface learning (Data not shown); however, these differences were not significant for any of queries.

CONCLUSION

Our experience suggests that to change the learning approach may be an effective educational tool to help improving learning outcomes of students. Short answer question is hypothesized to enhance the development of deep learning. A single assessment does not fulfill all aspects of assessment and that there is a need for an evaluating system with multiple ways of assessment.

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