ORIGINAL ARTICLE

Evaluation of Learning Approaches among First-Year Medical and Dental Students of a Private University, in Malaysia

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ABSTRACT

INTRODUCTION: Every learner has a way of interacting with the knowledge they have acquired, and this interaction is called a learning approach. Knowing the student's favorite learning methods will facilitate them with directions tailored to their unique needs. This study aims to measure the differences in learning approaches among first-year medical and dental students of a private university, in Malaysia. **MATERIALS AND METHODS:** A three-month analytical cross-sectional study was undertaken among the interested students. The self-administered, validated ASSIST questionnaire was used to measure students' preferred learning approaches. The Pearson correlation and independent sample t-test were used to analyze the data with SPSS software. The p-value was set at less than 0.05 to indicate significant level. **RESULTS:** A total of 225 students participated, out of which 150 (66.7%) respondents were medical students, and 75 (33.3%) were dental students. Medical students reported a favoured considerably deep learning approach over dental students (t=2.874, p=0.004), and preferred the strategic approach to learning (t=2.051, p=0.041). There was a weak and no significant correlation between the concept of learning (learning as reproducing knowledge [RK] p=0.377, learning involving personal understanding [PU] p=0.269), self-rating (p=0.824), and the surface learning approach. Both medical and dental students have no significant difference in surface learning approach with t=0.556 and p=0.579. **CONCLUSION**: Medical students favoured deep and strategic learning over dental students. While there was no significant difference in the surface learning approach, the deep and strategic learning approaches were substantially connected with the notion of learning, types of courses/teaching, and self-rating. The knowledge of learning approaches will assist educators in making efforts to address students through successful teaching strategies. Once teachers understand the need to accommodate individual strengths and needs, they will devise appropriate new teaching methods.

Keywords
assist questionnaire, medical and dental students, learning approaches

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INTRODUCTION

Learning is described as how individuals improve their ability to perceive, process, store, and recall information. Learning entails developing cognitive, verbal, physical, and social skills and acquiring and modifying knowledge, skills, strategies, beliefs, attitudes, and behaviors. The methods they use to evaluate information differ from one another. The learning approach can be defined as the method used by each student to engage with the information they have gathered uniquely. There are three types of learning approaches namely deep approach, strategic approach, and surface approach. The goal of a deep approach is to ensure that the student has mastered the topic and has integrated it into their prior knowledge. With the surface approach, the goal is to quickly retain the information so that it may be replicated, for instance, during an assessment. A strategic approach suggests that the goal would be to maximise evaluation grades rather than achieve perfect mastery or short-term memorisation.[1] A

higher percentage of students prefer the strategic approach than the other two learning approaches. The information is processed and analysed by the individual, and it becomes knowledge.[2]

Each student can use their unique learning approach. Understanding learning approaches and tailoring teaching tactics has become a cornerstone of effective teaching. Learning approaches expertise can assist instructors in making efforts to reach pupils through successful teaching strategies. Students' academic success and the achievement of instructional objectives are also influenced by learning approaches.[3] Knowing the students' preferred learning approaches can assist in offering instructions that are targeted to their specific needs. There is a strong need to encourage teachers to adapt their teaching methods based on the learning approaches of their students, as this can lead to improved learning results.

Teachers must be encouraged to modify their teaching approaches to the requirements of their students. Once the teacher recognizes the need to adapt individual strengths and needs, they can devise appropriate novel teaching methods.[4] Although there are numerous studies on learning approaches for a single course, there are relatively few studies comparing the learning approaches of medical and dental students. In addition, this university did not have complete data on the students' learning approaches. Thus, the objective of this study is to assess the various learning approaches used by first-year medical and dental students in a private institution.

MATERIALS AND METHODS

An analytical cross-sectional survey was conducted among first-year medical and dental students using a validated questionnaire. The target group was first-year university students, and the samples were collected from two faculties using convenient sampling. The purpose of selecting first-year students is to investigate the causes of poor performance in these courses at the start time, so that early intervention can be implemented. The estimated sample size was 220, based on (the mean difference between medical and dental students toward different learning approaches=5, SD=12, 95 percent CI, 80 percent power, and non-response rate=20 percent). The data was obtained in their lecture hall from all 150 medical students and 75 dental students. The inclusion criteria were all first-year MBBS and BDS programme students who attended the class on the days of data collection, regardless of ethnicity or gender. Students who did not agree to participate in the study were excluded.

Procedure and Research Tools

After attaining prior consent from the authorized representative, the time for data collection was scheduled, and the students were met in person. The purpose and objective of the study were clearly explained to participants via an information sheet, and they were informed that participation was voluntary. It was stressed that all data gathered would be kept strictly confidential. The participants were requested to sign a consent form attached to the questionnaire to ensure their willingness to participate in the study.

The demographic details were filled in by the participants, which included: name, age, gender, address, year of study, and discipline of study. ASSIST Questionnaire was the tool used in this study.[5] ASSIST is an acronym for 'Approaches and Study Skills Inventory'. It is a tool that is easy to use and gives information on learning approaches and how to maximize students' potential. ASSIST questionnaire is a 52 -item, self-reporting, multi-choice questionnaire which is universally used and freely available online. ASSIST measures three perceptual learning approaches: deep, strategic, and surface approaches.

1. Deep approach – Relates to seeking meaning, relating ideas, using evidence, and interest in ideas (16 items).

2. Strategic approach – Relates to organized studying, time management, monitoring effectiveness, and achievement motivation (20 items).

3. Surface approach – relates to lack of understanding, lack of purpose, syllabus boundness, and fear of failure (16 items).

The questionnaire with the English version was given to

the participants in hard copies in order to analyse their learning approaches. Respondents were only allowed to select one option from a set of five Likert scales for each question. There was no negative item for reverse scoring. On a five-point Likert scale, where 5 is for agreeing, 4 is for somewhat agreement, 3 is for undecided, 2 is for disagreeing slightly, and 1 is for disagreeing, all items were scored. The questionnaire took approximately 15-20 minutes to complete. The scores for the items that make up each of the learning-style scales were added together for each respondent, and the mean score for each scale was determined.

Ethical Consideration

The Ethical Committee of the Faculty of Medicine approved this study in 2018.

Statistical Analysis

The analysis was performed using the IBM SPSS Statistics for Windows, version 20 software. The descriptive statistics were shown with frequency, percentages, mean, and standard deviation. The correlation between independent variables (conception of learning, types of courses/teaching, and self-rating) and dependent variables (deep, strategic, and surface learning approaches) were analysed with Pearson correlation and regression analysis. The independent sample t-test was used to compare the faculty (medical and dental) across the various approaches to studying. A p-value less than 0.05 was accepted as a statistically significant relationship between the two

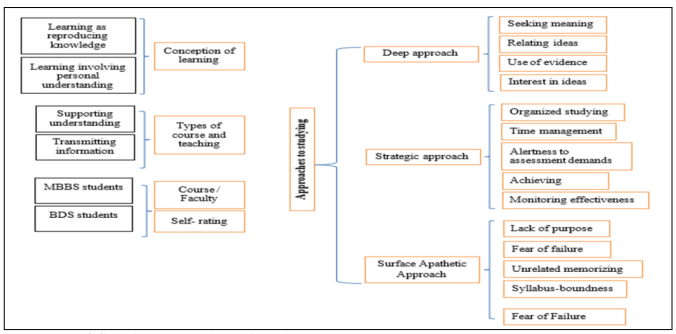

Figure 1: The diagram identifies the connection between (learning conceptions, preferences for teaching, faculty, self-rating), and approaches to studying.

RESULTS

The total number of respondents who participated in this study was 225. Among them, 150 (66.7%) respondents were medical students, and 75 (33.3%) were dental students. This study included all year-one medical and dental students, and the response rate was 100%. On the day of data collection, there were no absent students. All variables are normally distributed. The mean ± SD of the conception of learning was [25.6±3.1], deep approach [59.9±8.6], strategic approach [73.1±12.6], surface approach [54.6±9.3], types of course and teaching [31.8±5.4], and self-rating on assessed work was [73.1±12.6].

Relationship between three learning approaches and factors related to learning approaches (Table I)

i. Relationship between the deep approach to learning and its related factors

Correlation between the concept of learning and deep approach to learning

There was a weak positive correlation between the concept of learning (learning as reproducing knowledge [RK]) & the deep approach of learning with r=0.31. Around 9.0 % of the variation in the deep approach can be explained by the learning as reproducing knowledge with (R^2=0.091, p<0.001). The concept of learning (learning involving personal understanding [PU]) and deep approach was positively correlated with r=0.25, and only 6.2% of the variation in the deep approach can be explained by the learning involving personal understanding with (R^2=0.062, p<0.001).

Correlation between types of teaching and deep approach to learning

There were positive correlations between types of teaching (supporting understanding [SU] and transmitting information [TI]) and deep approach of learning with r (SU)=0.399, r(TI)=0.185, and 15.9% and 3.4% of the variation in the deep approach can be explained by types

of teaching (R2(SU)=0.159, p<0.001, R2(TI)=0.034, p=0.005).

Correlation between self-rating on assessed work and deep approach to learning

The self-rating on assessed work and deep approach was positively correlated with r=0.237 and 5.6% of the deep approach variation can be explained by the learning involving personal understanding (R^2=0.056, p<0.001).

Relationship between faculties and deep approach to learning

Medical students reported significantly favored the deep approach of learning over dental students (t(223)=2.874, p=0.004).

ii. Relationship between the strategic approach of learning and its' related factors

Correlation between the concept of learning/ types of teaching and strategic approach to learning

Both concepts of teaching [learning as reproducing knowledge-RK and learning involving personal understanding-PU] were a significantly positive relationship between the strategic approach of learning among the students and have a positive correlation between types of teaching [SU and TI] & strategic approach of learning with p(SU)<0.001 and p(TI)=0.026.

Correlation between self-rating on assessed work & strategic approach to learning

The higher rating score on self-rating on assessed students' work was positively correlated to the strategic approach of learning with r=0.384, p<0.001.

Relationship between faculties & strategic approach to learning

Medical students favoured the strategic approach of learning more than dental students (t(223)=2.051, p=0.041).

iii. Relationship between the surface approach of learning and its' related factors

Correlation between the concept of learning/ self-rating on assessed work and surface approach of learning

There was a weak and no significant correlation between the concept of learning [learning as reproducing knowledge-RK and learning involving personal understanding-PU] and surface approach of learning (r(PK)=0.59, p=0.377; r(PU)=0.074, p=0.269) and also found no significant correlation between self-rating on assessed work & surface approach of learning r=0.015, p=0.824.

Correlation between types of teaching and surface approach of learning

Both types of teaching were expressively correlated with the surface approach to learning.

Relationship between faculties and surface approach of learning

Both medical students (M=54.44, SD=9.9) and dental students (M=55.17, SD=8.0) have no significant difference in surface approach of learning, t (223)=0.556, p=0.579.

Table I: Relationship between three approaches of learning and factors related to learning approaches

i. Relationship between the deep approach to learning and its related factors

Approaches to studying		Deep Approach Statistical test value and p-value
The conception of learning	as reproducing knowledge [RK]	r=0.301, R^2=0.091, p=<0.001
	learning involving personal understanding [PU]	r =0.249, R^2=0.062, p=<0.001
Preference for teaching which	supports understanding [SU]	r =0.399, R^2=0.159, p=<0.001
	transmitting information [TI]	r =0.185, R^2= 0.034, p=0.005
Self-rating	Self-rating	r =0.237, R^2=0.056, P=<0.001
Faculty	Medicine Dentistry	t (223) =2.874, p=0.004

r=Pearson correlation analysis, R^2=regression analysis, t-student t-test, p<0.05 as a significant relationship

ii. Relationship between the strategic approach of learning and its' related factors

Approaches to studying		Strategic approach Statistical test value and p-value
The conception of learning	as reproducing knowledge [RK]	r=0.242, R^2=0.059, p=<0.001
	learning involving personal understanding [PU]	r =0.293, R^2=0.086, p=<0.001
Preference for teaching which	supports understanding [SU]	r =0.329, R^2=0.108, p=<0.001
	transmitting information [TI]	r =0.149, R^2=0.022, p=0.026
Self-rating	Self-rating	r =0.384, R^2=0.147, p=<0.001
Faculty	Medicine Dentistry	t (222) = 2.051, p=0.041

r=Pearson correlation analysis, R^2=regression analysis, t-student t-test, $p<0.05$ as a significant relationship

iii. Relationship between the surface approach of learning and its' related factors

Approaches to studying		Surface approach Statistical test value and p-value
The conception of learning	as reproducing knowledge [RK]	r=0.059, R^2=-, p=0.377
	learning involving personal understanding [PU]	r =0.074, R^2=-, p=0.269
Preference for teaching which	supports understanding [SU]	r =0.165, R^2=0.027, p=0.013
	transmitting information [TI]	r =0.226, R^2=0.051, p=0.001
Self-rating	Self-rating	r =0.015, R^2=-, p=0.824
Faculty	Medicine Dentistry	t (222) = -0.556, p=0.579

r=Pearson correlation analysis, R^2=regression analysis, t-student t-test, $p<0.05$ as a significant relationship

Relationship between faculties and types of teaching

There were no significant mean differences between medical and dental students' responses to types of teaching [both supporting understanding-SU and transmitting information-TI] with $t_{(SU)}$ (223)=0.852, p=0.395 and $t_{(TI)}$ (223)=1.837, p=0.068.

Relationship between approaches of learning and different faculty (Table II)

Comparison between medical and dental students and deep approach to learning

Both faculties from medical and dental students' concept of learning (learning as reproducing knowledge [RK]) & deep approach were positively correlated with $r_{(medical)}$=0.275, $r_{(dental)}$=0.351, and 7.6% and 12.3% of the variation in the deep approach can be explained by learning as reproducing knowledge ($R^2_{(medical)}$=0.076, p=0.001, $R^2_{(dental)}$=0.123, p=0.002). Besides this, the medical and dental students' concepts of learning involving personal understanding [PU] were also positively related to their deep learning approach. It was found that there was no significant positive relationship between types of teaching as transmitting information [TI] & the deep approach of learning, self-rating on assessed work & deep approach of learning among dental students.

Comparison between medical and dental students and strategic approach to learning

Apart from medical students' response to types of teaching as transmitting information [TI] was a weak correlation to the strategic approach of learning and not significant with r=0.14, p=0.088.

Comparison between medical & dental students and surface approach to learning

There was no significant correlation between their concepts of learning (learning as reproducing knowledge - RK) and the surface approach of learning in both medical and dental students. The dental students' concept of learning (learning involving personal understanding-PU) and surface approach was positively correlated with r =0.361, and 13% of the variation in the surface approach can be explained by learning involving personal understanding with (R^2=0.130, p=0.001). The medical students' responses to both types of teaching were also positively related to their surface learning approach. The dental students' responses to the type of teaching as transmitting information/ self-rating on assessed work and surface approach of learning were significantly positive correlation to each other.

Table II: Relationship between approaches of learning and different faculty

i. Comparison between medical and dental students and deep approach to learning

Approaches to Studying	Faculty	Deep Approach Statistical test value and p-value
Concept of learning: learning as reproducing knowledge [RK]	Medical	r=0.275, R^2=0.076, p=0.001
	Dental	r=0.351, R^2=0.123, p=0.002
Concept of learning: learning involving personal understanding [PU]	Medical	r =0.166, R^2=0.028, p=0.042
	Dental	r =0.411, R^2=0.169, p<0.001
Preference for teaching: supporting understanding [SU]	Medical	r =0.425, R^2=0.181, p<0.001
	Dental	r =0.337, R^2=0.114, p=0.003
Preference for teaching: transmitting information [TI]	Medical	r =0.234, R^2=0.055, p=0.004
	Dental	r =0.165, p=0.158
Self-rating	Medical	r = 0.308, R^2= 0.095, p<0.001
	Dental	r =0.046, R^2=-, p=0.695

r=Pearson correlation analysis, R^2=regression analysis, p<0.05 as a significant relationship

ii. Comparison between medical and dental students and strategic approach to learning

Approaches to Studying	Faculty	Strategic Approach Statistical test value and p-value
Concept of learning: learning as reproducing knowledge [RK]	Medical	r =0.224. R^2=0.050, p=0.006
	Dental	r =0.284, R2=0.081, p=0.014
Concept of learning: learning involving personal understanding [PU]	Medical	r =0.274, R^2= 0.075, p=0.001
	Dental	r =0.333, R^2=0.111. p=0.003
Preference for teaching: supporting understanding [SU]	Medical	r =0.219, R^2=0.048, p=0.007
	Dental	r =0.570, R^2=0.325, p=<0.001
Preference for teaching: transmitting information [TI]	Medical	r =0.140, p=0.088
	Dental	r =0.249, R^2=0.062, p=0.031
Self-rating	Medical	r =0.402, R^2=0.162, p<0.001
	Dental	r =0.335, R^2=0.112, p=0.003

r=Pearson correlation analysis, R2=regression analysis, p<0.05 as a significant relationship

iii. Comparison between medical & dental students and surface approach to learning

Approaches to Studying	Faculty	Surface approach Statistical test value andp-value
Concept of learning: learning as reproducing knowledge [RK]	Medical	R=0.002, p=0.979
	Dental	R=0.188, p=0.106
Concept of learning: learning involving personal understanding [PU]	Medical	R=0.040, p=0.630
	Dental	R=0.361, R^2=0.130, p=0.001
Preference for teaching: supporting understanding [SU]	Medical	R=0.222, R^2=0.049, p=0.006
	Dental	R=0.033, p=0.776
Preference for teaching: transmitting information [TI]	Medical	R=0.176, R^2=0.031, p=0.032
	Dental	R=0.371, R^2=0.138, p=0.001
Self-rating	Medical	R=0.102, p=0.218
	Dental	R=0.284, R^2=0.080, p=0.014

r=Pearson correlation analysis , R2=regression analysis, p<0.05 as a significant relationship

DISCUSSION

The students' concept of learning, the nature of studying, and their preferences for different types of instruction can be evaluated by the Approaches and Study Skills Inventory for Students (ASSIST) at the university level. There are three approaches to study: deep, strategic, and surface.[6] Approaches to studying refer to the students' general orientation towards learning in academic situations. Students who take a deep approach to learning must understand the meaning of the topic and apply the ideas to problems using evidence from theory. This type of studying can help students memorize things and use the acquired information effectively by reproducing knowledge.[5] In this study, there was a positive correlation between learning as reproducing knowledge & a deep approach to learning (Table I, i).

Reproducing knowledge is important for medical and dental students, and it is proof that the students remember and understand the concepts thoroughly. Based on the qualitative study in the Western Michigan University Homer Stryker M.D. School of Medicine, it was reported that students perceived biomedical science knowledge as essential roles for educational outcomes. Students believed that by doing assignments in biomedical science, knowledge in clinical reasoning and decision-making could be improved. Learning basic concepts in Pathology and Physiology helped students to differentiate between normal and abnormal body changes which made students able to make better differential diagnoses. [7]

The deep approach to learning can help students gain a more profound knowledge of the concepts, meanings, and mechanisms that are important to them. The students can develop critical thinking skills by understanding the basic concepts. This study proved that the concept of learning involving personal understanding (PU) is positively related to the deep approach to learning (Table I, i), which includes connecting the basic concepts most effectively. Medical and dental students need to adapt to a deep approach to learn effectively and improve their critical thinking skills, which is necessary to solve case-related problems in the clinical years. The integrated teaching of Anatomy and Physiology showed

improvement in clinical decision-making in specialties like cardiology, anesthesiology, and intensive care medicine based on the study done by Dickinson et al., 2020.[8] Supporting understanding (SU) includes encouraging students to think for themselves by guiding them, persuading them to read more about the subject, and providing explanations beyond the lectures.[5] It is essential for medical and dental students to think beyond the textbook and expand their reading to improve their knowledge of updated trends, technologies, and treatments. This type of teaching can help produce more qualified doctors by inculcating a continuous and self-learning nature among the students. A variety of resources like lectures, textbooks, and e-learning tools are available nowadays in universities.

A study carried out among Australian medical students indicated that the most frequent resources used by the students were question banks. The evaluation of question banks in the universities is important as it may lead to poor alignment to curricula.[9] Transmitting information (TI) teaching means students must know important facts related to the topic, know the suitable reading material necessary for their lecture, and be aware of the nature of their exam.[5] Since they just entered the medical/dental course, many first-year students may not know how to study and prepare their notes effectively. This type of teaching focuses on grasping the learning outcomes. A study carried out by Raphael TE, Pearson PD stated that access to appropriate sources of information enhances the student's understanding of questions and the qualities of their answers.[10]

Moreover, knowledge related to different types of exam questions helped the students to formulate answers and reduce exam stress.[11] There were positive correlations between types of teaching (supporting understanding [SU] and transmitting information [TI]) and deep approach to learning based on the data (Table I, i). This study shows that SU and TI teaching can develop a deep approach to learning, which is the most effective learning approach for the students. Suppose lecturers can effectively guide these two learning approaches. In that case, students will achieve higher exam scores and be prepared to tackle more difficult clinical-based problems in the coming years.

The strategic approach to learning means knowing how to organize studies, time management, assessment awareness, and achieving a score.[5] Deep approach to studying is important for the student to understand the topic. Still, it is more important for the student to answer effectively in the exam to achieve the best score with a strategic approach. It can also be correlated with a study done by Shankar et al. showing that most medical students used deep and strategic approaches to learning.[12] Studies have shown that self-regulated learning strategies are associated with academic success.[13] In this study, medical students, reported a more favorable approach to deep learning and strategic learning than dental students (Table 1-i, ii). The course curriculum for medical is much more comprehensive than dental as they need to learn the pathophysiology of the whole body.

Self-regulated learning is particularly effective in clinical education. Medical students need to read more on basic science topics when compared to dental students in the first year by using a deep approach and strategic approach to learning. Motivating the students and developing their self-regulation skills may enhance student engagement in coursework and their use of strategic and deep skills. It will help them learn better by constructing meaning from connecting ideas and concepts. Once the students are motivated, they can achieve their personal goals.[14] It was shown that both concepts of teaching (RK and PU) were positively related to the strategic approach to learning among the students (Table I, ii).

Building knowledge by acquiring facts and information by adopting reproducing knowledge (RK) and personal understanding strategy (PU) will prepare students for exams. A study conducted in Singapore showed that a higher percentage of medical students preferred strategic approaches to deep and surface approaches, with the predominant approach to learning being the strategic approach.[15] If lecturers can support students with supporting understanding (SU) and transmitting information (TI) types of teaching, the student's approach towards learning will be improved. Knowing how to learn by strategic approach is a key factor in passing the examination and getting a high score for first-year students. This study showed that the concepts of learning

(learning as reproducing knowledge (RK)) could also lead to a surface approach to learning in both medical and dental students (Table II, iii). Some students are forced to enroll in the course by their parents; passing the exam and scoring well on the exam become more important than understanding the topics. These students experience lower motivation and less knowledge about the program than their fellow students. Because of these reasons, they are more prone to choose the surface approach behavior, helping them achieve high scores. Sometimes the fear of failure due to heavy workloads or a huge amount of study material may lead to a decline in motivation and push the students towards a surface approach study behavior.[16] As a result of this research, it was shown that medical and dentistry students have different learning approaches, and medical students are favored deep and strategic learning approaches. Using data from a single private institution, selecting only two faculties, and evaluating first-year students were all limitations. There was no year-by-year comparison, so the findings cannot be generalized to all university students.

CONCLUSION

The study aimed to compare the perception of learning and approaches to studying in medical and dental students. Most of the students have chosen the deep and strategic learning approaches in both student groups, indicating that they are motivated, goal-oriented, and aware of the program they decided to study. However, a few of them have opted for the surface approach of studying either because they lack motivation and interest or feel burdened by the enormous coursework. Medical students are more likely to be exposed to deep and strategic learning approaches than dental students. Based on this study, we can conclude that educators should create a positive environment and motivate the students to choose more deep and strategic approaches to enhance their learning and prepare them for a better future and patient care.

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CONFLICT OF INTEREST

None

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