LEARNING STYLE AND ACADEMIC SUCCESS OF MEDICAL STUDENTS IN THE UNIVERSITY OF SULAIMANI-IRAQ

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ABSTRACT

Background

Students with knowledge of their learning styles could be empowered to identify and use the techniques of learning best suited to their individual styles, resulting in greater educational satisfaction.

Objectives

To assess whether the learning styles, previous academic ability, and demographic factors of undergraduate medical students relates to their performance in the final examinations.

Methodology

A longitudinal questionnaire study was done for 283 medical students (third-year and fifth-year) in the University of Sulaimani at the beginning of year 2013 and at the end of the same year. Three factors have been studied in relation to the selection of medical students: cognitive factor (previous academic ability), non-cognitive factor (learning styles), and demographic factors. In our questionnaires we used a tripartite model. It is based on three learning approaches: "deep," "strategic," and "surface". Deep learning is based on three motivational factors (intrinsic motivation, vocational interest, and personal understanding) and three learning processes (making links across material, searching for a deeper understanding of the material and looking for general principles).Final average at this academic year was used the dependent variable.

Results

Students who has deep and strategic learning styles had higher final degrees than those students who has surface learning style. Previous academic ability and demographic factors seems to have no predictive power.

Conclusions

There are evidences that deep and strategic learning styles correlates with success in medical College. The present examinations are probably encouraging a deeper understanding of medicine and medical practice. It may therefore be useful for medical educational programs to teach students how to use the more successful study skills.

Keywords: *Learning styles, Academic success, Medical students, Sulaimani university.*

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INTRODUCTION

Most medical school curriculum have adopted new methods of teaching and learning to varying degrees [1]. It has been argued that knowledge of learning styles can be useful to both teachers and students, in that teachers can tailor teaching process to correlate with the learning styles of students [2]. Similarly, students with knowledge of their learning styles could be empowered to identify and use the techniques of learning best suited to their individual styles, resulting in greater educational satisfaction.

Learning style is a different and unique ways used by individuals as they prepare to learn and recall information [3]. Educational theory suggests that clinical experience and success at examinations bears a relationship to learning styles. School performance has been shown to correlate poorly with students' performance in the university, possibly because university education requires more deep learning and analytical thinking compared to simple factual recall required for advanced level or equivalent school examinations. Nonetheless, some students seem to cope with the challenge of adopting deep learning better than others, and perform well at undergraduate and postgraduate levels [4].

Students learn by relying on understanding, by relying on rote memorization and reproducing memorized information, or by a combination of these methods to varying degrees [5].

Three different approaches to learning have been identified, deep approach, surface apathetic approach and strategic approach. Deep approach is an organized approach where emphasis is placed on understanding concepts and relating ideas, and is considered the preferred style of learning in university education. Surface apathetic approach, on the other hand, is syllabus bound superficial learning with emphasis on route memorization. Strategic approach students use either deep or superficial learning as appropriate for a particular topic, with the aim of achieving highest possible grades. This type of learning is characterized by alertness to assessment and monitoring, and results in fragmented understanding of subject matter, with poor integration across topics [6].

While surface apathetic approach is more likely to result in failure in university final examinations, both deep approach and strategic approach are more likely to result in success [7].

There are no published data on learning styles and approaches among undergraduates in Sulaimani medical schools. Secondary education in schools is largely didactic lecture based, encouraging students towards auditory and read/write learning styles. The medical school of the University of Sulaimani, has an integrated modular curriculum with a significant emphasis on problem based learning. The curriculum utilizes many diverse methods of learning, and assessments include a significant continuous assessment component. We thus hypothesized that there would be significant differences in learning styles and learning approaches seen between medical students. This study was conducted to assess the effects of learning styles, previous academic ability, and some demographic factors on future performance of undergraduate medical students. Identifying such effect of learning styles and approaches could potentially be used to tailor these curricula to encourage diverse learning styles, and to encourage deep learning rather than strategic and superficial learning.

METHODOLOGY

Longitudinal questionnaire study was done for medical students (third-year and fifth-year) in the University of Sulaimani during 2013. The authors reported no conflict of interests and no funding was received for this work. The study was approved by the Ethics and Research Committee of the College of Medicine, University of Sulaimani. Participants were informed about the project.

Various questionnaires have been developed over time to indicate students' overall approaches to learning and their perceptions of the teaching-learning environments, as well as related aspects of students' attitudes and experience. We have utilized one such questionnaire, developed by the Committee of Deans and Heads of Medical Schools in UK. They commissioned a systematic review of factors believed to be significant predictors of success in medicine. The review examines data on the predictive validity of the three factors that have been studied in relation to the selection of medical students: cognitive factor (previous academic ability), non-cognitive factor (learning styles), and demographic factors. In our questionnaires we used a tripartite model. It is based on three learning approaches: "deep," "strategic," and "surface". Deep learning is based on three motivational factors (intrinsic motivation, vocational interest, and personal understanding) and three learning processes

(making links across material, searching for a deeper understanding of the material and looking for general principles). Strategic learning is motivated by a desire to be successful and leads to patchy and variable understanding. Surface learning is motivated by fear of failure and a desire to complete a course, with students tending to rely on learning "by rote" and focusing on particular tasks [8].

Table 1. Summary of the differences in motivation and study process in surface, deep, and strategic learning [9].

Learning style	Motivation	Process
Surface	- Completion of course - Fear of failure	- Rote learning of facts and ideas - Focus on discrete task components - Little real interest in content
Deep	- Interest in subject - Vocational relevance - Personal understanding	- Relate ideas to evidence - Integrate material across courses - Identify general principles
Strategic	- To achieve high grades - To compete with others - To be successful	- Use techniques that achieve highest grades - Patchy and variable understanding

RESULTS

Out of 310 medical students interviewed, response rates were 90.3% (283/310). Demographic characteristics of the 283 medical students are shown in Tables 2 and 3. More than half were males but there is no significant difference in performance between both genders (P=0.09). Most of students lives in the center of Sulaimani (71%), the mean ± SD final average for those who live in Sulaimani center, Sulaimani periphery, outside of Sulaimani were, 65.2 ± 7.9, 65.1 ± 6.5, and 64.7 ± 8.2, respectively, the difference is statistically not significant. According to their parent's education, most of students had father and mother education at diploma and bachelor level, but the difference between father and mother education and the performance of medical students is not statistically significant(P >0.05).

The mean secondary school final average (pre-academic ability) for our students was 98.3 ± 2.7 (ranged from 96.3 to 99.9) (Table 3), but we did not find any significant correlation between the previous academic ability and the performance of medical students (P>0.05). Most of students in this research studied for 2 – 9 hours each day with mean hours 4.3 ± 0.8, table 3, with better final average for those who studied 6-8 hours per day, the difference is statistically significant (P< 0.05).

According to learning style, 29.3% of students were with deep learning style, 34.6% of them with strategic learning, and 36.1% of them are with surface learning style (Table 4). The final average for those with deep learning habit is 70.8 ± 9.7 (95% CI for mean; 68.7 to 73.0), for those with strategic learning is 63.1 ± 8.2 (95% CI for mean; 61.4 to 64.7), and 57.2 ± 8.0 (95% CI for mean; 55.7 to 58.8) for students with surface learning style (Figure 1). The differences between groups were highly significant (F = 56.8; P < 0.001) (Table 4).

Table 2. Gender, address, father and mother education of 278 medical students.

General characteristics	Frequency (%)	Performance Mean ± SD	P value
Gender			
- Male	152 (53.7 %)	66.3 ± 11.7	0.09
- Female	131 (46.3 %)	68.5 ± 8.4	
Address			
- Center	201 (71.0 %)	67.2 ± 7.9	
- Periphery	52 (18.4 %)	63.1 ± 6.5	P > 0.05
- Outside	30 (10.6 %)	61.7 ± 8.2	
Father education			
- Illiterate	18 (6.4 %)	60.6 ± 11.5	
- Primary & secondary	44 (15.5 %)	59.2 ± 10.8	P > 0.05
- Diploma & bachelor	173 (61.1 %)	64.8 ± 9.7	
- Higher education	48 (17.0 %)	65.2 ± 11.1	
Mother education			
- Illiterate	48 (7.0 %)	62.6 ± 10.1	
- Primary & secondary	69 (24.4 %)	63.1 ± 9.4	P > 0.05
- Diploma & bachelor	153 (54.1 %)	64.8 ± 9.9	
- Higher education	13 (4.5 %)	63.6 ± 8.5	
Total	283 (100%)		

Table 3. General characteristics of 278 medical students.

General characteristics	Mean + SD	Range
Age	20.1 ± 1.2	18.0 – 25.0
pre-academic ability*	98.3 ± 2.7	96.3 – 99.9
Performance (final average)	63.1 ± 10.2	45.0 – 86.3
Study hours each day	4.3 ± 0.8	2 – 9

***mean score of Baccalaureate exam.**

Table 4. Learning style and final average of medical students.

Type of learning	No.(%)	Mean + SD	Range	P-value
Deep	83 (29.3)	70.8 ± 9.7	51.8 – 86.3	
Strategic	98 (34.6)	63.1 ± 8.2	45.0 – 85.5	<0.001
Surface	102 (36.1%)	57.2 ± 8.0	45.0 – 75.8	

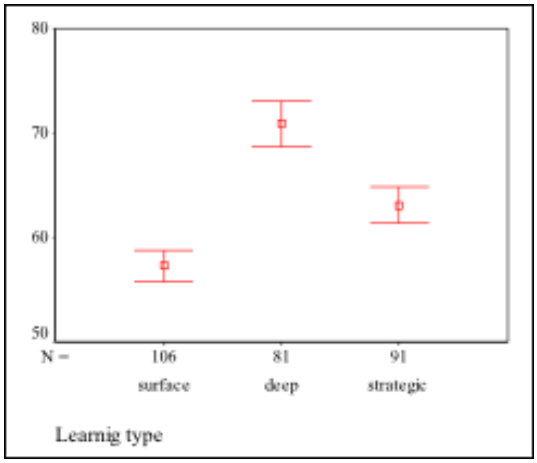

Figure 1. Means and 95% CI of performance (final average) of medical student by learning style

DISCUSSION

The continuous production and change nature of scientific knowledge in medicine causes excessive information in the field. When medical schools attempt to place up to date information into their curricula, medical students face an over-whelming burden of information and desperately tend to memorize all the facts instead of in depth learning. The solution to this problem was thought to be training medical students as self-learners who adopted a lifelong learning philosophy [9]. This study was carried out to gain an understanding of the factors that may affect the academic success including learning style of medical students in Sulaimani University and to answer the question: What is the factors that affect on the academic success of medical students? The findings of this study also provide insight into the ways that our medical students learn. We think that our study may help to shed light on medical students learning development.

Few studies have examined the effects of learning styles and demographic factors in relation to achievement in medical training. The research that has been undertaken has mainly concerned on measures of previous academic ability as a predictor of undergraduate achievement. This study revealed no variation most demographic factors, and its implications on academic success of medical students. As in other study [10], we found that, there is no significant association between type of gender, father and mother education and future performance of medical students. A consistent finding in other literature is that women tend to perform better than men in their medical training and are more likely to attain an honors degree. However, these differences were small and reached significance only when the sample sizes were large [11]. A factor that seems to affect success in medical school is coming from the residency of medical students (center of Sulaimani, rural places, and outside Sulaimani). To examine these factors, the researchers investigate the predictive power of them on the performance of medical students. The study found that, those who live in center of Sulaimani do better in final examination, with good predictive power for this factor on performance of medical students. This finding seem to be linked to the socioeconomically disadvantages background, and also related to the effect of living faraway from their families.

In this study, the final degree of secondary school examinations, are comparatively poor predictors of students' success at medical college. The lack of correlation between the secondary school examinations average and performance in final examinations calls into question the validity of this average in entrance of students into medical college [12].

Educational theory predicts that examination success should both relate to study habits [13-15]. Our study shows that students with deep and strategic learning style do better in final examinations. The studies examining the tripartite model in medical students have shown a relatively consistent finding of a significant positive association between the use of deep and strategic learning and final marks [16-18].

Conclusions

Secondary school examinations average is comparatively poor predictors of student's success at

university. Better predictors are students' approaches to their work, or their study habits and learning styles. Since, deep and strategic learning styles predict success in final examinations at university, the present examinations are probably encouraging a deeper understanding of medicine and medical practice. It may therefore be useful for medical educational programs to teach students how to use the more successful study skills.

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