

A Multi Dimensional Assessment System for Identifying Causes of Underachievement in Pre Clinical Medical Students



Medical Science

KEYWORDS : Assessment, Pre clinical medical Students, DASS, Learning Styles and Learning Habits.

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ABSTRACT

Objectives: To determine causes for underachievement using a multi dimensional assessment battery. *Method:* The students who consented to participate in study were segregated as achievers and underachievers based on scores in University's assessment and both the groups were subjected to a battery of assessments which included Memletics learning styles inventory, Depression anxiety stress scale (DASS), and Study habits questionnaire to determine learning styles, emotional factors and study habits respectively. *Results:* A total of 103 out of 150 students participated in the study. Among these 50 were (48.5 %) classified as underachievers. The comparison of learning styles between achieving and underachieving group shows that the predominant learning style in the achieving group is multimodal learning style (32 %) while that among the underachievers is single modality learning style, (40 % had visual learning style). Though the difference is not significant, low frequency of multi modal learners in the underachieving group emphasizes the importance of including domain specific learning strategies. The achieving group scored lower than underachieving group on depression (6.42+5.25 and 8.19+5.87 respectively), anxiety (6.78+5.16 and 7.83+5.22) and stress (7.19+5.47 and 8.06+5.28) with female gender being more vulnerable. Assessment of study habits showed that items like being up to date on assignments and participation in group discussions positively correlated with achievement. *Conclusion:* The need for understanding the learning styles and adopting a multimodal teaching strategies to match these styles and the necessity for a professional team to help the students to handle emotions were implicated from this study.

Introduction

Underachievement is an area of interest and challenge for the educationalists and psychologist from early 1950s (Dowdall and Colangelo, 1982). The theories on underachievement agree that the poor performance among students is not solely due to inadequate potential of the student (McCoach & Siegle, 2003; Schultz, 2002). Rather the poor performance may result from collaborative or independent effects of many internal and external factors (Garber, 2002; Harris & Coy, 2003; Kanevsky & Keighley, 2003; Schultz, 2002). Among these internal and external causes of underachievement the negative emotion, study habits and motivational aspects plays a major role.

Taking a lead from this literature or information current study set its objectives as 1) to understanding the causes of underachievement among pre clinical medical students. 2) To find out the frequency of various modalities of learning style among achieving and under achieving first year medical students. 3) To find out the any influence of negative emotional factors on achievement and under achievement. And finally, to find out the study habit's relationship with various negative emotions such as depression, anxiety and depression and also with learning styles.

Methods

The study subjects were the first year pre clinical MBBS students who agreed to participate in the study by signing an informed consent. The participants were selected irrespective of any social and demographic discrepancy. The final sample of participants consisted of 103 students. The mean age of the participants was 17.52 ± 0.67 with 34 (35.02 %) male participants. The subjects were segregated as achieving and underachieving on the basis of scores obtained in the University's block assessment. Thus we had two group viz. achieving group with a 53 (51.5 %) students and the underachieving group with 50 (48.5) students.

After classifying the students , they were subjected to a detailed assessment using 1) Memletics learning styles inventory (Memletics 2009), which is a measure to find out the prominent modality / style of learning such as multimodal, visual, auditory, kinesthetic etc. The test is considered to be a reliable and valid tool to find out the dominant learning style of the individual participant with 170 questions. 2) Depression anxiety stress scale 21 (DASS) (Lovibond & Lovibond 1995), and Study habits questionnaire to determine learning styles, study habits and emotional factors respectively. The test measures certain negative

emotions such as depression, anxiety and stress of the subjects. The shorter version of DASS with 21 items has been used for the current study as it is easy to administer and score. The study also included a checklist of Study habits which elicits responses such as up to date in academics, participation in outside class room group studies, extracurricular activities, motivational aspects, keeping premises of study health etc.

Results

The data thus obtained were analyzed using Windows version of SPSS .16. The analysis of the data was done at two levels. In the first level the descriptive statistics were used to obtain frequency distribution of demographic data such as age and sex and mean for clinical variables such depression, anxiety and depression. In the secondary level a correlative analysis were done to know the relationship of study habits with emotional factors and also with learning style. And finally by keeping the initial assessment scores obtained in DASS 21 as base line measurement compared students emotional scores over each block assessment. Means after the completion of each block assessment we will get two groups such as achieving group and under achieving. This group participants may vary or increase or decrease after each block assessment. Thus in our study after the first block assessment the number of under aching participants were 50 and after the second block assessment it was 36.

Group	Mean ± SD	t	p
Achieving	17.54 ± .585	.309	.758
Under achieving	17.50 ± .753		

Table 1. The mean age of participants in achieving and underachieving pre clinical medical students.

Modality	Achievers (%)	Underachievers (%)	Total (%)
Multi modal	17 (32.08)	11 (22)	28 (27.18)
Visual	14 (26.42)	20 (40)	34 (33.01)
Auditory	13 (24.53)	12 (24)	25 (24.27)
Physical	9 (16.98)	7 (14)	16 (15.53)
Total	53 (51.5)	50 (48.5)	103 (100)

Table 2. The distribution of various modalities of learning style between achieving and underachieving pre clinical medical students. d

Table 3. Mean scores obtained by the achieving and underachieving pre clinical medical students on depression, anxiety and stress.

Variables	Group	Mean ± SD	t	p
Depression	Achieving	6.33 ± 5.40	-1.328	.187
	Under achieving	7.76 ± 5.58		
Anxiety	Achieving	6.67 ± 5.52	-.933	.353
	Under achieving	7.63 ± 4.83		
Stress	Achieving	7.13 ± 5.31	-.683	.496
	Under achieving	7.86 ± 5.51		

Table 4. Relationship between achievements, learning style, negative emotions with various study habits

	Achievement	Multi modal	Visual	Auditory	Physical	Depression	Anxiety	Stress
Physical Setting	-.194	.043	-.187	-.085	.295**	.081	.104	.198
Preview	-.033	.146	.333**	.073	.008	-.040	.085	.126
Reading	-.047	.058	.306**	.159	.180	.002	.039	.068
Note taking	-.129	.081	-.101	-.027	-.349**	-.058	.017	-.014
Remembering	-.078	.020	.105	-.033	.055	.066	.046	.141
Study help	-.206*	.156	.133	.012	.056	-.200*	-.155	-.164
Tests & Quizzes	-.042	.123	-.006	-.116	.241*	-.207*	-.044	-.033

Table 5. Role of Emotional factors in achievement evidenced by the baseline scores of DASS over first and second block categorization

Variables	After the First Block				After the Second Block					
	Group	N	Mean	t	p	N	Mean	t	p	
Depression	Achievers	52	6.33 ± 5.40	-1.328	.187	Achievers	67	6.42 ± 5.25	-1.570	.120
	Under achievers	51	7.76 ± 5.59			Under achievers	36	8.19 ± 5.87		
Anxiety	Achievers	52	6.67 ± 5.51	-.933	.353	Achievers	67	6.78 ± 5.16	-.986	.326
	Under achievers	51	7.63 ± 4.82			Under achievers	36	7.83 ± 5.23		
Stress	Achievers	52	7.13 ± 5.31	-.683	.496	Achievers	67	7.19 ± 5.47	-.771	.443
	Under achievers	51	7.86 ± 5.51			Under achievers	36	8.06 ± 5.29		

Discussion

The overall result of the study indicates a need for evaluating the students on multidimensional way that looks into the style of learning or emotional factors or problems related to their study habits. From this study we observed that majority of participants who are in achieving group are multi modal learner, i.e., they can learn information or fact by which ever modality of delivery. But majority of students in the underachieving group are visual learners. They learn information only through visual modality. Visual learners are those who wanted to take the information presented by means of diagrams, flow charts or pictures, notes etc. To become achiever either the students should develop multi modal processing of information intake or curriculum should adapt alternative techniques that satisfies the other single domain subjects also. As the present study is an initial initiative and pilot, it is difficult to generalize that underachiever's majority belongs to visual modality learners but, chances of having single modal learning styles might be more in this group.

On correlation analysis with achievement and various study habits revealed necessity for more help needed on study habits by the underachieving group, as the items on study help negatively correlated with achievement (Table 5). On further analysis of the various modality of learning style with study habits it revealed reveals that previewing and reading positively correlated significantly (p ≤ 0.01) level. This shows the sensitivity to visual modality of learning style and study habits, as visual modality learning is associated with reading or previewing rather to any other kind of getting information. In our sample most of the under achievers belongs to visual modality of learners, hence providing chance or class assignment on reading or previewing syllabus material might helpful for them to achieve more. Physical modality learners are those who want to manipulate some thing while they learn such as taking practical or engaging in other kinds of physical activities such roaming around or keeping something in their hand while learning. Our results shows a positive correlation between study habits such as physical set up, note taking and participating in tests and quizzes. Means from out results it is evident that physical learners do well when their physical setting is more congenial such as keeping study desk neat and clean, setting up a proper place for learning etc. Also they might have the habit of note taking for learning things in more structured or proper way. The note taking behavior can also consider as one of the physical activity, which may provide them more cue to remember things. Finally they also wanted to participate in tests and quizzes which can be consider as participation in other activities out side the regular academic schedule.

As far as the analysis of emotional factors are concerned (Table 4), though not significant we found higher level of emotional problems in underachieving group, which they responded in the semi structured interview as home sickness, unable to manage time, or disturbances from other children etc. The role of emotional problems on underachievement has been established by taking the base line assessment result on DASS which was administered to 50 subjects after the completion of first block. The mean and standard deviation are mentioned in the table 6. We took the same data and analyzed on second block underachievers which was 36. By common sense the scores on these negative emotions should come down or it should be equal when the number of candidates comes down. But on the contrary we observed a high level than that it was observed after first block assessment, clearly indicating role of emotional problem in consecutive under achievers. Those who scored in the normal range might have been gone in to the achieving group after the completion of the first block assessment and thus the result. From this it can be understood that as in the previous literature emotional problems does influences the achievement of students.

To conclude the study highlights the need for a proper assessment which will cover the biological aspects of learning measured using learning style and psychological factors assessed using standardized measure to evaluate the emotional factors might be useful to prepare a module for comprehensive assess-

ment system for helping struggling students. Also understanding the learning styles and adopting multimodal teaching strategies to match these styles and the necessity for a professional team to help the students to handle emotions were implicated from this study.

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