



## LEARNING STYLES OF COLLEGE OF APPLIED MEDICAL SCIENCES STUDENTS IN SAUDI ARABIA

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### ABSTRACT

**Background:-** Medical students experience substantial stress in the process of adapting to a highly demanding new learning environment. It is the teachers' responsibility to fulfill the learning requirements of the students and promote a positive learning environment. So the cross-sectional study was conducted to determine the learning preferences of our students using the VAK questionnaire.

**Methods:-** Total 100 students from different departments of College of Applied Medical Sciences from Majmaah University were selected using simple random sampling method. The VAK questionnaire was administered individually to the female students and they were allowed to choose best method they prefer. The students were then categorized as visual, auditory or kinesthetic learner depending on the predominant option they choose.

**Results:-** Most of them (92%) preferred single mode of learning style in which 31% of them preferred visual, 36% preferred auditory and 25% preferred kinesthetic style. Only 8% of them preferred two modes in which 2% selected visual & Auditory and 6% selected visual & kinesthetic style. However, none of the students have preferred all the three modes / multimode as their learning style.

**Conclusion:-** Students have significantly different learning styles; it is the responsibility of the instructor to address this diversity of learning styles among the students and develop appropriate learning approaches. Knowing the students' preferred modes can enrich the learning experience.

**KEYWORDS :** learning style, medical students, VAK Questionnaire, nursing students

### INTRODUCTION

Learning is acquisition of information and memory is the retention, storage and retrieval of the information (William F Ganong, 2005). For, memory to be consolidated there has to be repeated learning. Students have preferences for the ways in which they receive information. Learning style is defined as the learner's preferred mode of learning in terms of the sensory modality by which they prefer to take in new information. Each learner has distinct and consistent preferred ways of perception, organization and retention. The visual, auditory and kinesthetic (VAK) questionnaire identifies student's preferences for particular modes of information presentation. Knowing the students preferred modes can help to avoid mismatches in the styles between instructors and learners, assist students to build confidence and more effectively manage their own learning, overcome the predisposition to treat all students in a similar way and motivate teachers to move from their preferred modes to using others (Prabha V, 2013). In higher education the students represent a broad spectrum in terms of ethnics, culture, background, age, experience, environment, states, nation, level of preparedness and knowledge along with different learning styles and skills. This diversity is welcomed and addressed; however, it also presents a challenge for instructors to meet the educational needs of all students. Though the students have different learning styles, it is the responsibility of the instructor to address this diversity to develop and adapt appropriate learning approaches in order to motivate and improve their performance in academics (Tanner K and Allen D, 2004).

### Objectives

1. To identify the different modes of learning style of students of College of Applied Medical Sciences in Majmaah University.
2. To find out the association between the learning style and their selected demographic variables.

### METHODOLOGY

**Research Design:** Descriptive research design

**Sample size:** 100 students from various department of College of Applied Medical Sciences.

**Sampling technique:** simple random sampling method

**Setting:** College of Applied Medical Sciences (Girls campus), Majmaah University, Kingdom of Saudi Arabia.

### Inclusion criteria:-

- Only girls who were studying from level/semester 3 to level 8.
- Girls who were willing to participate in the study.
- Those who were between the age group of 17 and 25.

### Description of the Tool

Learning style of the students was determined by Fleming's VAK questionnaire. This Questionnaire consists of 30 questions with A for visual, B for Auditory and C for kinesthetic as options. The VAK questionnaire was administered individually to the female students and they were allowed to choose best method they prefer. The students were then categorized as visual, auditory or kinesthetic learner depending on the predominant option they choose. If the students preferred a single sensory modality then they were considered as unimodal, two preferences as Bimodal and three preferences as Trimodal learners.

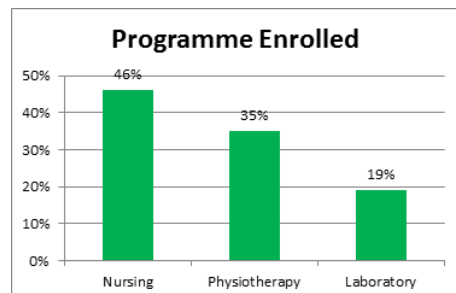
### Ethical Approval

Formal permission was obtained from the Institutional Review Board and the Vice Dean of the College of Applied Medical Sciences to conduct the study. Participation of the samples was voluntary and the written consent was obtained from those students who were willing to participate in the study.

### RESULTS

#### a) Characteristics of the participants

Most (70%) of the students were between the age group of 20-22 years (mean age 21) and 64% of them were studying 2<sup>nd</sup> year either 3<sup>rd</sup> or 4<sup>th</sup> level in CAMS. Fig.1 reveals that about 46% of the samples were studying Nursing course, 35% physical therapy and only 19% were doing Medical Laboratory course. Regarding their preferred teaching method, almost equal percentage (34% & 33%) of them selected Lecture as well as Hands-on-training following which demonstration 20%. In cumulative GPA (Grade Point Average), more than half (54%) of the samples had 3-3.9 following which 44% got 4- 5.



**Fig.1 Percentage distribution of CAMS students enrolled for different programs**

#### b) Different modes of Learning styles of the participants

Table .1 shows percentage of students who preferred different mode of learning style. Among 100 samples, most of them (92%)

preferred single mode of learning style in which 31% of them preferred visual, 36% preferred auditory and 25% preferred kinesthetic style. Only 8% of them preferred two modes in which 2% selected visual & Auditory and 6% selected visual & kinesthetic style. However, none of the student have preferred all the three modes as their learning style.

**Table.1 Frequency and percentage distribution of students who preferred different mode of learning style**

Learning style			
SI No	Learning style	Frequency	Percentage
1	Uni mode	92	92.0
2	Bi mode	8	8.0
3	Tri mode	0	0
	Total	100	100.0

**c) Association between the learning style and their selected demographic variables**

Table 2 shows that there was a statistical difference between the learning style and their year and level / year of study at  $p < 0.05$  level. Compared to 3<sup>rd</sup> year and 4<sup>th</sup> year students, more number (39.1%) of 2<sup>nd</sup> year students selected Auditory style for their learning followed by kinesthetic (34.4) and visual (18.8%) where as 50% of the 3<sup>rd</sup> year students and 60% of the 4<sup>th</sup> year students selected Visual style as their main method of learning followed by auditory and kinesthetic style. As the 2<sup>nd</sup> year students are from 3<sup>rd</sup> and 4<sup>th</sup> level (beginner level) of their studies they could understand the basic concepts by hearing as well as through 'Doing' only. However, the students from 5<sup>th</sup> and above levels (Intermediate and advanced levels) could cope up with the advanced concepts by 'visual mode' and 'Bimodes – visual and kinesthetic'.

**Table 2 Association between learning style and selected demographic variables of the participants**

Demographic variables			category					chi square
			Visual	Auditory	Kinesthetic	Visual & Auditory	Visual & Kinesthetic	
Age	17-19 Years	Count	7	10	9	0	0	$\chi^2=5.33$ df=8 p=0.7 NS
		% within Age	26.9%	38.5%	34.6%	.0%	.0%	
	20-22 years	Count	23	24	15	2	6	
		% within Age	32.9%	34.3%	21.4%	2.9%	8.6%	
	23-25 years	Count	1	2	1	0	0	
		% within Age	25.0%	50.0%	25.0%	.0%	.0%	
level/year	2nd year / 3rd or 4th level	Count	12	25	22	2	3	$\chi^2=17.6$ df=8 p=0.02 <b>Significant</b>
		% within level/year	18.8%	39.1%	34.4%	3.1%	4.7%	
	3rd year / 5th or 6th level	Count	13	9	2	0	2	
		% within level/year	50.0%	34.6%	7.7%	.0%	7.7%	
	4th year / 7th or 8th level	Count	6	2	1	0	1	
		% within level/year	60.0%	20.0%	10.0%	.0%	10.0%	
Programme	Nursing	Count	16	14	11	1	4	$\chi^2=8.8$ df=8 p=0.3 NS
		% within Programme	34.8%	30.4%	23.9%	2.2%	8.7%	
	Physical therapy	Count	8	16	11	0	0	
		% within Programme	22.9%	45.7%	31.4%	.0%	.0%	
	laboratory	Count	7	6	3	1	2	
		% within Programme	36.8%	31.6%	15.8%	5.3%	10.5%	
Teaching method	lecture	Count	9	16	9	0	0	$\chi^2=13.7$ df=12 p=0.32 NS
		% within Teaching method	26.5%	47.1%	26.5%	.0%	.0%	
	Demonstration	Count	5	7	4	2	2	
		% within Teaching method	25.0%	35.0%	20.0%	10.0%	10.0%	
	Hands on training	Count	9	10	12	0	2	
		% within Teaching method	27.3%	30.3%	36.4%	.0%	6.1%	
problem based learning	Count	1	1	0	0	0		
	% within Teaching method	50.0%	50.0%	.0%	.0%	.0%		
cumulative GPA	4-5	Count	15	14	12	0	3	$\chi^2=3.8$ df=8 p=0.86 NS
		% within cumu GPA	34.1%	31.8%	27.3%	.0%	6.8%	
	3-3.9	Count	16	21	12	2	3	
		% within cumu GPA	29.6%	38.9%	22.2%	3.7%	5.6%	
	2-2.9	Count	0	1	1	0	0	
		% within cumu GPA	.0%	50.0%	50.0%	.0%	.0%	

**Discussion**

Learning and memory are the two sides of a coin, without learning memory cannot be consolidated. Keefe. J.W (1979) stated learning style as “the composite of cognitive, affective and physiological domains which are influenced by environmental factors that serve as the most powerful leverage available to educators to analyze, motivate, and assist students. It is the foundation of a truly modern approach to education. According to Dunn, Beaudry, and Klavas (1989), “Learning styles is biologically and developmentally imposed set of personal characteristics and make the same teaching method effective for some and ineffective for others.” Every person has a learning style – it’s as individual as a signature.

There is a trend in University teaching to instruct all students in the same way (i.e., a straight lecture format). Educators use this lecture format because of the relative ease of information passing, the need to cover the content, a long history of traditional lecturing and

perhaps due to their own preferences in learning. The results of the VAK questionnaire should convince teachers to use multiple modes of information presentation. This may require instructors to stay from their own preferred modes of teaching and learn to use a variety of styles, which will positively affect learning (Choudhary R and Dullo P, 2011). Hein, T.L and Bundy DD (1999) stated, Acknowledgement of students' individual learning styles can play a critical role in the learning process. Formal learning style assessment can provide useful information that benefits the student as well as the instructor.

In the current study, VAK questionnaire was administered to CAMS (College of Applied Medical Sciences) students to determine their preferred modes of information presentation. Total 100 students from nursing, Physiotherapy and Laboratory department participated in this study. Most of them (92%) preferred single mode of learning style. Among the students who preferred a single mode

of information presentation, only 31% of the students preferred the visual. These students prefer information to arrive in the form of graphs, charts, and flow diagrams. They are sensitive to different or changing spatial arrangements and can work easily with symbols. Similarly, only 36% of the students preferred receiving information by speech, which arrives to the learner's ear and is therefore coded as auditory by the questionnaire. Only 25% of the students preferred their learning by using all their senses, including preferred their learning by using all their senses, including touch, hearing, smell, taste, and sight. This group was described as kinesthetic. These students prefer concrete, multisensory experiences in their learning. Although learning by doing matches their needs, they can easily learn conceptual and abstract material provided it arrives with suitable analogies, real-life examples, or metaphors (Hein, T.L. and Bundy DD, 1999). Among the hundred students, 8% preferred two modes of information presentation in which 2% selected visual & Auditory and 6% selected visual & kinesthetic style. However, none of the students have preferred all the three modes as their learning style. Encouraging results have been obtained by the study conducted by Prabha V (2013) on assessing learning styles among first year Dental students in India who reported that most of the students preferred a single mode (57.96 %) of information presentation (visual, auditory or kinesthetic). Among the students who preferred a single mode of information presentation, only 17.24% of the students preferred the visual, 22.62% of the students preferred auditory and only 18.1% preferred kinesthetic style.

However, the present study findings are not supported by the study conducted by Samarakoon et.al (2013) in Colombo on Learning styles of Medical undergraduates, reported that the majority (69.9%) of undergraduate medical students had multimodal learning styles. But the same study reported that among the unimodal learners (30.1%), the clear majority were auditory learners (50%) which were supporting the current study.

Carbo, M and Hodges, H (1988) explain that "Students who understand and then are provided opportunities to make use of their learning styles tend to feel valued, respected, and empowered". Hein, TL and Bundy, DD similarly stated, "Acknowledgement of students' individual learning styles can play a critical role in the learning process. Furthermore, the use of formal learning style assessments can provide useful information that benefits the student as well as the instructor."

Although Unimodal preference with auditory learning is predominant among 2nd year students, learning styles do seem to change as they move up the ladder of medical education. Despite the majority remaining unimodal learners, a shift is seen to occur from predominantly auditory to predominantly visual learning from second to final years. When the students are exposed to a teaching style that matches their learning style, students score higher marks on tests than those not taught in their learning style; and it is advantageous to teach and test students in their preferred modalities (Dunn and Dunn K, 1978).

### Conclusion

In conclusion, the VAK questionnaire identifies student's preferences for particular modes of information presentation. Students have significantly different learning styles; it is the responsibility of the instructor to address this diversity of learning styles among the students and develop appropriate learning approaches. Knowing the students' preferred modes can enrich the learning experience.

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