

2 PREVALENCE OF LEARNING STYLE PREFERENCES AMONGST FIRST YEAR MEDICAL STUDENTS.

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Abstract :

Introduction: First year medical students have to incorporate vast amount of information. Learning is influenced by the mode of the input that has been presented to the students. Visual ,auditory ,reading/writing and kinesthetic are amongst the known modes of information presentation.

Objective: The present study was aimed at trying to understand the different learning preferences that medical students prefer to have and thereby, try and incorporate those learning preferences into teaching methods.

Method: The present study was conducted on 120 first year medical students in the dept of physiology at grant govt. medical college Mumbai. Standard 16 question based VARK questionnaire was administered to the students and assessed to decipher their learning styles.

Results: Analysis of the study revealed that only 34.17% preferred a single mode or uni-modal way of information presentation and 65.83% preferred multimodal learning methods. Out of the uni-modal learners, preference wise, 4.87% were visual,21.95% were auditory,12.19% were read/write and 60.97% were kinesthetic learners. Amongst the multimodal ones preference wise distribution was 26.58% for two modes(bi-modal),20.25% for three modes(tri-modal), and 53.16 % for all four modes(quad-modal).

Conclusion: knowing about learning preferences can thus enable the instructor to address this diversity of learning styles amongst students and develop appropriate learning approaches.

Keywords: Visual , Auditory, Read/Write, Kinesthetic , uni-modal ,bi-modal, tri-modal, quad-modal, multi-modal, learning styles ,learning preferences.

Introduction

Medical students undergo a drastic change in content as well as matter, in terms of syllabus, when they enter the professional medical colleges. These students in general vary widely in terms of culture ethnicity medium of instruction and level of preparedness but have the same matter to study once they are into the professional course. Owing to their diverse backgrounds and thereby possible different learning styles and preferences, it is indeed a challenge for the teaching faculty to meet the educational needs of all students. Meeting this challenge becomes an onus on the teaching faculty

to address this diversity of learning styles amongst students and develop appropriate learning approaches.(1)

A learning style or preference is the complex manner in which , and conditions under which, learners most efficiently and most effectively perceive ,process, store and recall what they are attempting to learn.(2)

We in this study are using Vark as an acronym that stands for four major sensory modes of learning : Visual, Auditory, Read /Write and Kinesthetic depending upon the mode by which a learner prefers to receive information. Amongst the four modes one or more modes are often dominant and preferred by the learners. The present study sheds light on the chosen modes of learning that the medical students tend to adopt during their first year of medical career.

Coming on to the different modes of learning, visual learners learn through seeing drawings, pictures and other image rich teaching tools. Auditory learners learn by listening to lectures , exploring material through discussions, and talking through ideas. Reading /Writing learners learn through interaction with textual materials, whereas kinesthetic learners learn through touching and experiences, that emphasize doing, physical involvement and manipulation of objects.(3)

Our interest to know about preferred learning modes led us to use the Vark inventory tool for assessing individual preferences. The Vark questionnaire developed by ND Fleming was used as the required tool to meet our needs.(4)

Materials and methods.

The Vark questionnaire has been developed by Fleming which identifies the preferences of students for particular modes of information presentation.(4) This questionnaire can be administered both as a hard copy as well as a freeware that can be completed online. We preferred to use the hard copy version on our first year medical students for ease of use and administration. The study was conducted on 120 first year medical students in the department of physiology at Grant Govt. Medical College and J.J. group of hospitals, Mumbai , after obtaining proper approval from the institutional ethical committee. Even an e-mail confirmation and consent to use this questionnaire for the study was taken from N.D. Fleming, the developer of the VARK questionnaire. Only those students who were interested and volunteered for the present study were taken into consideration after taking their written consent. Students also had the option open, of not participating for the study, if they so wished.

Analysis

The number of students who preferred each mode of learning was divided by the total number of responses to determine the percentage of students in each category. These percentages were then plotted on pi charts to have a clear and vivid imagery about the distribution of different modal preferences amongst the students.(3 for pi charts)

Results

Figure 1 shows the percentage of students who preferred different modes of information presentation. They are as follows: visual (1.67%) auditory (7.5%) reading/writing (4.16%), kinesthetic (20.83%) and multiple modes (65.83%). 34.17 % thus preferred a single mode of information presentation (i.e visual,auditory reading/writing or kinesthetic.)

Figure 2 now shows the further division of the 79 students (65.83% of all students)who preferred multiple modes of information presentation. Of these 79 students some students preferred two modes (bimodal 26.58%),some preferred three modes (trimodal 20.25%) and some preferred four modes (quad modal 53.16 %). Thus quad modal preferences were seen to occupy more than half of the preferences of multi modal ones.

Figure 3 now goes on to show the percentage wise breakup of trimodal and bimodal preferences. Of the students who preferred three modes of information presentation, some students preferred auditory read/write and kinesthetic (ARK 11.39%) , some preferred visual, auditory and kinesthetic(VAK 7.59 %) and some preferred visual ,read/write and kinesthetic (VRK 1.26%).None of the students preferred visual,auditory and read/write combination (VAR 0%).

Of the students who preferred two modes of information presentation, some students preferred auditory and read/write (AR 2.53%) , some preferred visual and auditory (VA 2.53 %) and some preferred read/write and kinesthetic (RK 6.32%),some preferred visual and kinesthetic (VK 5.06%),some preferred auditory and kinesthetic (AK 10.13 %).None of the students preferred visual and read/write combination (VR 0%).

Discussion

Our study involved the first year medical students who had just stepped into a complete different environment after years of school study. The syllabus in the schooling days and that in the professional medical career nowhere match each other in terms of matter, content , vastness and ease of understandability. It is a daunting task for both the medical student as well as the teacher to channelize this vast matter , material and knowledge into its requisite place. I.e. the memory and understanding of the ardent student.

In this attempt we designed our present study to be conducted on these new comers of professional medical college. The standard 16-item, self reported multiple choice VARK questionnaire designed by Fleming was used for this purpose of evaluating the students preferred modes of information presentation.(4) Out of the 120 students included in the present study 41 (34.17%) preferred a single mode of information presentation whereas 79 students (65.83%) turned out to prefer multiple modes of the students. Of the students who preferred a single mode of information presentation only 7.5% preferred auditory mode of learning which comprised, hearing to instructions, lectures and audio-aids. 4.16 % were those who preferred gathering information just by reading/writing. Probably targets those people who are fervent "BOOK-WORMS" or those who solely rely on notes been dictated by their teachers. Visual mode was preferred by just 1.67 %

of students. Most likely, they are those, who prefer information to be presented in the form of visual cues like graphs, charts and flow diagrams. Spatial arrangements and working with symbols seem to be their niche. 20.83 % of the students preferred learning using a mix combination of multiple sensory modes like touch, hearing, sight etc. They would like their learning to be by multisensory inputs like real life situations, workshops, tasks, hands on experiences and role playing.(3,5)

Quite a sizeable proportion of students i.e. 65.83% preferred the multimodal mode of information presentation. These students preferred their information to arrive in a variety of modes, thus balancing their preferences(3), by not clinging on to any specific sensory mode of input. They are often gifted by their innate ability to adapt to different teaching styles encountered during their course of study. They find it easy to opt in and out of different teaching strategies like being more visual in one system and being auditory in the other. Changing input tracts 'as and when' required and aligning themselves according to the information modes provided by the instructor seem to be their forte. Thus instructors would seem to provide more benefit by switching on to active learning strategies rather than sticking on to the traditional lecture format, which assumes that all students are auditory learners. Just by introducing active learning strategies and motivating teachers to move from their preferred modes to other learning modes the instructor could easily reach more students because of the better match between teacher and learner styles.(6-17)

Some students prefer one of the modalities over the other three so much that they find it difficult to understand the subject matter unless special care is taken to present it in their own preference mode. To make it so happen ,teaching should be multisensory and filled with variety. Visual learners can thus be targeted by the presence of models and demonstrations. Auditory learners can be reached through discussion during peer instruction(18-19),collaborative testing(20,21) debate (22), games (23-28) and answering questions(9). Manipulating models (30,31) and role playing(32) satisfies kinesthetic and tactile learners..Cooperative learning exercises, role playing, simulations, models, debates and games are amongst active learning strategies that can be used rampantly and efficiently in large classrooms. All these promote appreciable levels of motivation and involve enthusiasm.

Conclusion and summary

We thus conducted the present study with a motive to check out the prevalence of different learning modes and styles in the students who have managed to make it up to the medical career. Also in the backdrop, keeping in mind the scope of future research, wherein we could possibly see the effect of gender or probably their pre medical schooling and medium of instruction, we keep this study as a building block and foundation, meriting further innovations and research in the future.

Taking into consideration the present study, where we didn't delve into the nuance of doing anything apart from getting a random pool of students and analyzing their

learning modes and choices, we could reason up the proposition that, active learning strategies may be superior to the traditional lecture format in promoting thinking, reasoning, problem solving and decision making skills.

References

- 1 Tanner K and Allen D. Approaches to biology teaching and learning: learning styles and the problem of instructional selection-engaging all students in science courses. *Cell Biol Educ* 3: 197–201, 2004.
- 2 James W and Gardner D. Learning styles: implications for distance learning. *New Dir Adult Contin Educ* 67: 19–32, 1995.
- 3 Heidi L. Lujan and Stephen E. Dicarlo. First year medical students prefer multiple learning styles *advan in Physiol Edu* 30:13-16,2006
- 4 Fleming ND. *VARK, A Guide to Learning Styles*. [On-line: http://www.vark-learn.com/english/page.asp?p_questionnaire.]
- 5 Fleming ND. I'm different; not dumb. Modes of presentation (VARK) in the tertiary classroom. In: *Research and Development in Higher Education*, edited by Zelmer A. Proceedings of the 1995 Annual Conference of the Higher Education and Research Development Society of Australasia 18: 308–313, 1995.
- 6 Armstrong E and Parsa-Parsi R. How can physicians' learning styles drive educational planning? *Acad Med* 80: 680–684, 2005.
- 7 Bergman LG and Fors UG. Computer-aided DSM-IV-diagnostics—acceptance, use and perceived usefulness in relation to users' learning styles. *BMC Med Inform Decis Mak* 5: 1, 2005.
- 8 Collins J. Education techniques for lifelong learning: principles of adult learning. *Radiographics* 24: 1483–1489, 2004.
- 9 Forrest S. Learning and teaching: the reciprocal link. *J Contin Educ Nurs* 35: 74–79, 2004.
- 10 Gordon HRD. Identifying learning styles. *Educational Resources Information Center* ED 424 287, 1998.
- 11 Laight DW. Attitudes to concept maps as a teaching/learning activity in undergraduate health professional education: influence of preferred learning style. *Med Teach* 26: 229–233, 2004.
- 12 Lang H, Stinson M, Kavanagh F, Liu Y, and Basile M. Learning styles of deaf college students and instructors' teaching emphases. *J Deaf Stud Deaf Educ* 4: 16–27, 1999.
- 13 Lewthwaite BJ and Dunham HP. Enriching Teaching Scholarship through Learning Styles. *Educational Resources Information Center* (ERIC), ED 428 057, 1999.
- 14 Miller P. Learning styles: the multimedia of the mind. *Educational Resources Information Center* ED 451 140, 2001
- 15 Pillemer DB, Wink P, DiDonato TE, and Sanborn RL. Gender differences in autobiographical memory styles of older adults. *Memory* 11: 525–532, 2003.
- 16 Sandmire DA and Boyce PF. Pairing of opposite learning styles among allied health students: effects on collaborative performance. *J Allied Health* 33: 156–163, 2004.
- 17 Veenman MV, Prins FJ, and Verheij J. Learning styles: self-reports versus thinking-aloud measures. *Br J Educ Psychol* 73: 357–372, 2003.
- 18 Cortright RN, Collins HL, and DiCarlo SE. Peer instruction enhanced meaningful learning: ability to solve novel problems. *Adv Physiol Educ* 29: 107–111, 2005.

19 Rao SP and DiCarlo SE. Peer instruction improves performance on quizzes. *Adv Physiol Educ* 24: 51–55, 2000. 20 Cortright RN, Collins HL, Rodenbaugh DW, and DiCarlo SE. Student retention of course content is improved by collaborative-group testing. *Adv Physiol Educ* 27: 102–108, 2003.

21 Rao SP, Collins HL, and DiCarlo SE. Collaborative testing enhances student learning. *Adv Physiol Educ* 26: 37–41, 2002. 22 Scannapieco FA. Formal debate: an active learning strategy. *J Dent Educ* 61: 955–961, 1997. 23 Bailey CM, Hsu CT, and DiCarlo SE. Educational puzzles for understanding gastrointestinal physiology. *Adv Physiol Educ* 21: 1–18, 1999. 24 Collins HL, Rodenbaugh DW, Murphy TP, Kullics JM, Bailey CM, and DiCarlo SE. An inquiry-based teaching tool for understanding arterial blood pressure regulation and cardiovascular function. *Adv Physiol Educ* 27: 15–28, 1999.

25 Howard MG, Collins HL, and DiCarlo SE. “Survivor” torches “Who Wants to be a Physician?” in the educational games ratings war. *Adv Physiol Educ* 26: 30–37, 2002.

26 Mierson S. Skits and games to enhance students’ learning of physiology. *Am J Physiol Adv Physiol Edu (could not determine journal name)* 277: S283–4, 1999. 27 Moy JR, Rodenbaugh DW, Collins HL, and DiCarlo SE. Who wants to be a physician? An educational tool for reviewing pulmonary physiology. *Adv Physiol Educ* 24: 30–37, 2000. 28 Odenweller CM, Hsu CT, and DiCarlo SE. Educational card games for understanding gastrointestinal physiology. *Adv Physiol Educ* 20: 78–84, 1998.

29 DiCarlo SE and Collins HL. Colored letters: a tool to increase class participation in a large classroom. *Adv Physiol Educ* 25: 143, 2001.

30 Chan V, Pisegna JM, Rosian RR, and DiCarlo SE. Construction of a model demonstrating neural pathways and reflex arcs. *Adv Physiol Educ* 271: 14–42, 1991.

31 Silverthorn DU. Using demonstrations to uncover student misconceptions: the law of LaPlace. *Adv Physiol Edu* 277: 281–282, 1999.

32 Kuipers JC and Clemens DL. Do I dare? Using role-play as a teaching strategy. *J Psychosoc Nurs Ment Health Serv* 36: 12–17, 1998.

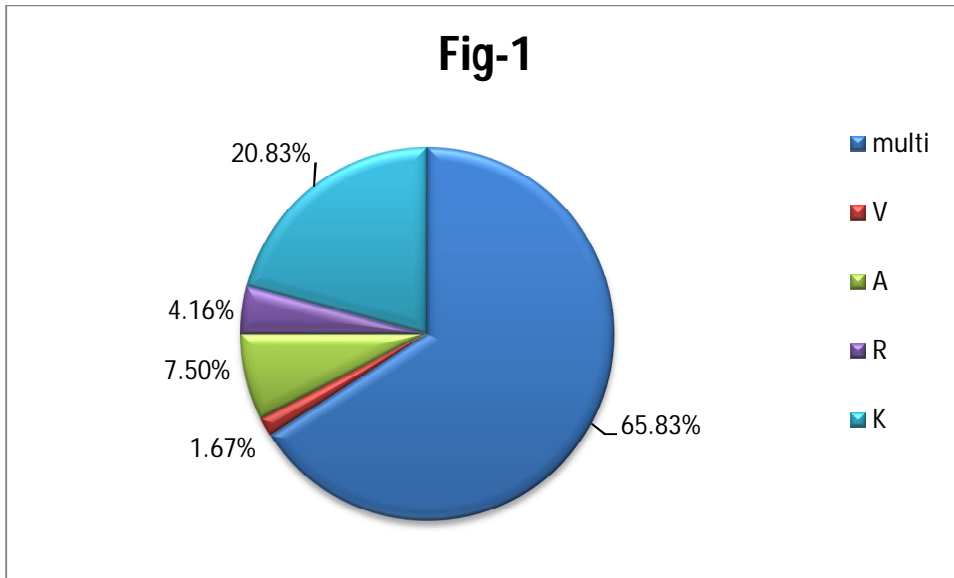


Fig-1 shows percentages of students who preferred visual ,auditory,reading/ writing kinesthetic and multiple modes of information presentation.

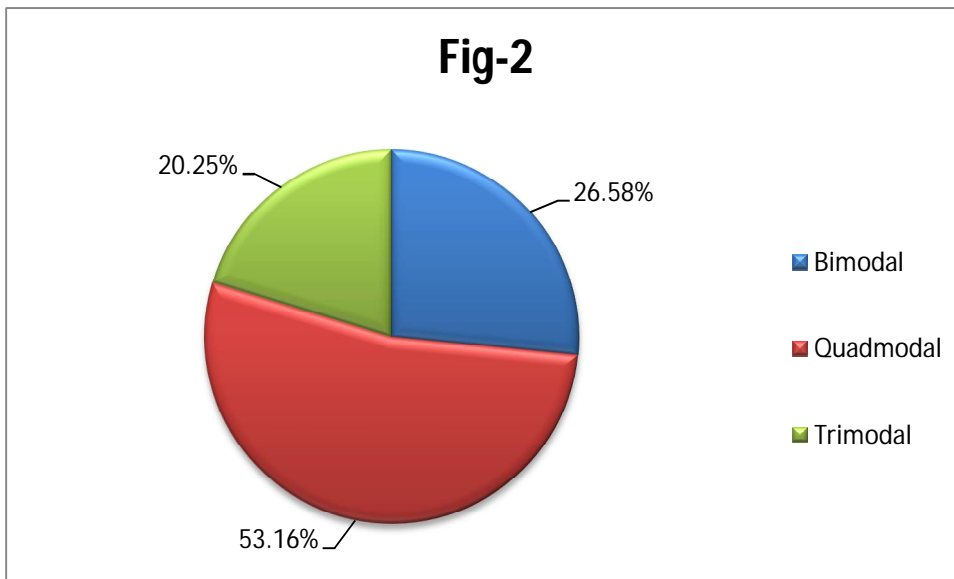


Fig-2 percentages of students who preferred two , three or four modes of information presentation.

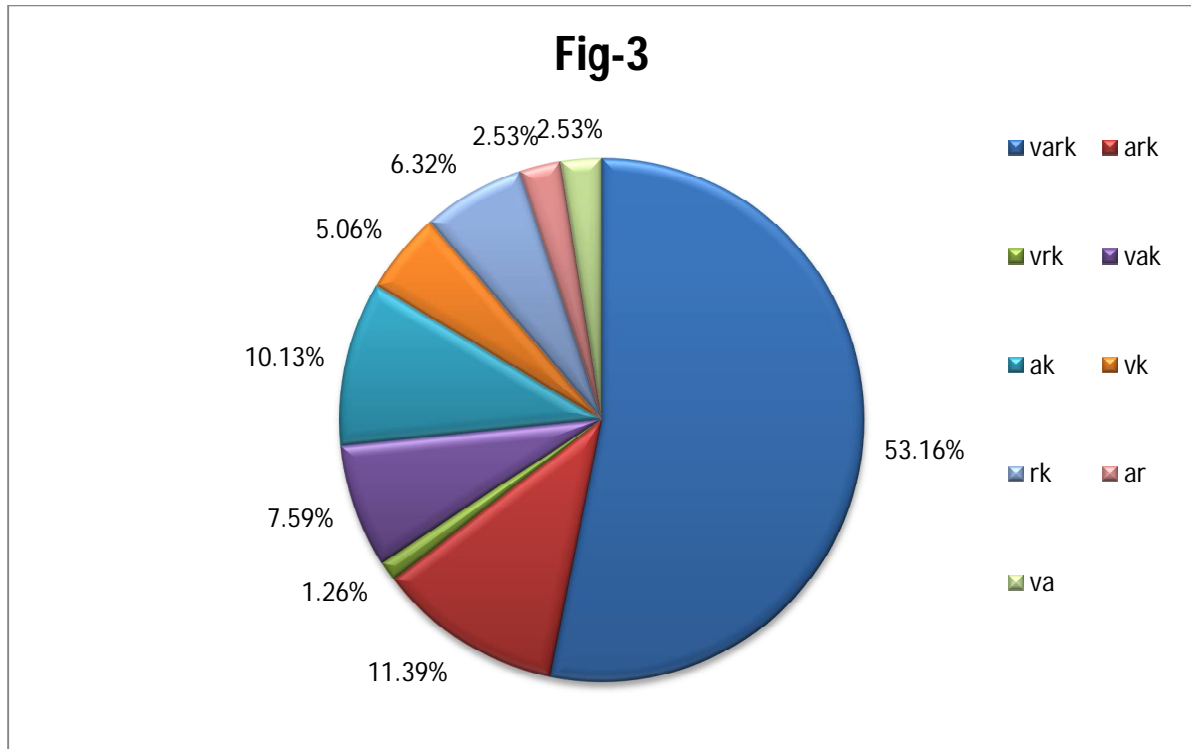


Fig -3 breakup of percentage of students who preferred three modes like VRK, VAK and ARK

And two modes like VA, AR, VK, RK and AK. VAR had zero preferences amongst trimodal students and VR had zero preferences amongst bimodal students and hence could not be represented in the pi chart.