ORIGINAL ARTICLE

Assessment of learning style based on VARK model among the students of Qom University of Medical Sciences

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Introduction: Learning is a dominant phenomenon in human life. Learners are different from each other in terms of attitudes and cognitive styles which effect on the learning of people. In this connection, VARK learning style assess the students base their individual abilities and method for obtaining much information from environment in dimensions of visual, aural, read/write, and kinesthetic. Since the knowledge of learning style is highly applicable to understand and recognition of the learning concept among students, within higher education.The present study aimed to determine the Assessment of Learning style based on VARK model in the students of Qom University of Medical Sciences.

Method: The current study is a cross-sectional design which was performed in 2015 on 279 students of Qom University of Medical Sciences. The students were already selected by a quota sampling and the data was collected via a standard questionnaire of VARK learning styles. The statistical data was analyzed through descriptive and inferential statistics by using SPSS statistical software.

Results: The mean age of students was 22.23±4.38 years and the mean of educational score was 16.85±1.65 that most of them were undergraduate and single students. The learning styles were effective with15.66%, 14.34%, 13.24%, and 9.07% respectively for aural, read/write, visual and kenesthetic. Also, 146 students (52.1%) preferred the single-modal style while 134 of students (48.8%) chose multi-modal.

Conclusion: According to the results which shows that the majority of the students preferred the single-modal style while approximately half of them favored multi-modal, it is suggested to use combined educational methods to achieve effective teaching and educational departments and faculty take all needs and educational styles into consideration when developing lesson plans to improve the educational quality.

Key words: Learning, Visual, Aural, Read/write, Kinesthetic

تقييم أساليب التعلم على أساس نموذج VARK في جامعة قم للعلوم الطبية

مقدمة: الحقيقة المهمة هي أن التعلم يهيمن على حياة جميع البشر، حتى أن المتعلمين مختلفون من حيث السمات الشخصية والمواقف والأساليب المعرفية التي تؤثر على تعلمهم. في هذه الأثناء، أسلوب التعلم في فارك يقيّم الطلاب بناء على قدراتهم الفردية وكيفية الحصول على معظم المعلومات من البيئة بأربعة أوضاع بصرية، سمعية، قراءة / كتابة وحركية . وبما أن معرفة أنماط التعلم لها العديد من الاستخدامات لإدراك مفهوم التعلم بين الطلاب في التعليم العالي. فقد هدفنا إلى تقييم هذه الدراسة من أجل تقييم أنماط التعلم على أساس نموذج VARK لطلاب جامعة العلوم الطبية في قم.

الأساليب: أجريت هذه الدراسة المقطعية التوصفية عام ٢٠١٥ على ٢٧٩ طالباً من جامعة قم للعلوم الطبية الذين تم اختيارهم من خلال أخذ عينات الحصص. تم جمع البيانات من خلال استبيان قياسي من أنماط التعلم VARK. تم تحليل البيانات باستخدام إحصائيات توصيفية واستنتاجية وبرنامج التحليل الإحصائي SPSS.

النتائج: متوسط عمر الطلاب ٢٢.٢٣±٤.٣٨ ومتوسط معدل التحصيل الدراسي ١٦.٨٥±١.٦٥ حيث كان أكثر الطلاب هم فتيات، غير متزوجين وفي المرحلة الجامعية. أساليب التعلم بين الطلاب وبالترتيب: سمعي ١٥/٦٦ بالمئة، قراءة/كتابة ١٤/٣٤ بالمئة، بصري ١٣/٢٤ بالمئة وحركي ٩/٠٧ بالمئة. ١٤٦ من الطلاب (٥٢/١ بالمئة) فضّلوا الأسلوب أحادي النمط (Single-modal) و١٣٤ أيضاً (٨/٤٨ بالمئة) فضلوا الأسلوب المتعدد الأنماط (multi-modal).

النتيجة: وفقا للنتائج ، أكثر من نصف الطلاب يفضلون الأسلوب الأحادي النمط والنصف الآخر تقريباً يفضلون الأسلوب المتعددة الأنماط، لذلك يُقترح أن تستخدم أساليب تدريس تركيبية للتدريس الفعال.

كلمات مفتاحية: أسلوب التعلم، VARK، سمعي، بصري، قراءة/كتابة، حركي، طلاب.

ارزیابی سبک های یادگیری بر اساس مدل VARK در دانشجویان دانشگاه علوم پزشکی قم

مقدمه: واقعیت مهم آن است که یادگیری حاکم بر زندگی همه انسان هاست، به گونه ای که فراگیران به تناسب ویژگی های شخصیتی، نگرش ها و سبک های شناختی با یکدیگر تفاوت هایی دارند که یادگیری آنها را تحت تأثیر قرار می دهد. در این بین سبک یادگیری وارک، دانشجویان را بر اساس توانایی های فردی و شیوه کسب بیشترین اطلاعات از محیط به چهار شیوه دیداری، شنیداری، خواندن/ نوشتن و جنبشی/ حرکتی ارزیابی می نماید. از آن جایی که دانش مربوط به سبک های یادگیری کاربردهای زیادی جهت درک و شناخت مفهوم یادگیری در میان دانشجویان را در آموزش عالی دارا است، از این رو برآن شدیم این پژوهش را با هدف ارزیابی سبک های یادگیری بر اساس الگوی VARK در دانشجویان دانشگاه علوم پزشکی قم اجرا نماییم.

روش ها: مطالعه حاضر یک مطالعه توصیفی- مقطعی است که در سال ۹۴ بر روی ۲۷۹ نفر از دانشجویان دانشگاه علوم پزشکی قم که به روش نمونه گیری سهمیه ای انتخاب شدند، انجام شد. ابزار گردآوری داده ها پرسشنامه استاندارد شده سبک های یادگیری وارک (VARK) بود. داده های آماری با استفاده از آمار توصیفی و استباطی و نرم افزار SPSS مورد تجزیه و تحلیل قرار گرفت.

نتایج: میانگین سنی دانشجویان ۲۲/۲۳±۴/۳۸سال و میانگین معدل تحصیلی ۱۶/۱±۸۵/۶۵بود که اکثر دانشجویان زن و مجرد و در مقطع کارشناسی بودند. سبک های یادگیری دربین دانشجویان به ترتیب شنیداری ۱۵/۶۶ درصد، خواندن/ نوشتن ۱۴/۳۴ درصد، دیداری ۱۳/۲۴ درصد و جنبشی/حرکتی ۹/۰۷ درصد بود. ۱۴۶ نفر از دانشجویان (۵۲/۱ درصد) سبک تک مدله (Single-modal)و ۱۳۴ نفر نیز (۴۸/۸ درصد) سبک چند مدله (multi-modal)را ترجیح دادند.

نتیجه گیری: با توجه به نتایج که نیم بیشتری از دانشجویان سبک تک مدله و نزدیک به نیمی دیگر سبک چند مدله را ترجیح دادند لذا پیشنهاد می شود که از روشهای آموزشی ترکیبی جهت تدریس اثر بخش استفاده گردد.

کلید واژه: سبک یادگیری، VARK، شنیداری، دیداری، خواندن/ نوشتن، جنبشی/حرکتی، دانشجویان

vark ماڈل کے مطابق طلباء کی پڑھائی کا جائزہ لینا۔یہ تحقیق قم یونیورسٹی آف میڈیکل سائنسس میں انجام پائی ہے

پیک گراونڈ: امر واقعہ یہ ہے کہ انسان کی زندگی میں تعلیم حاصل کرنے اور سیکھنے کی نہایت اہمیت ہے۔ تعلیم حاصل کرنے والے اپنی شخصیت، نظر، اور معرفتی روشن کے لحاظ سے ایک دوسرے سے الگ ہوتے ہیں۔اسی غرض سے وارک ماڈل بنایا گیا ہے اور اسکی ذریعے طلباء فردی توانائیوں، کے سہارے نیز حسن سماعت، حسن بصارت اور مطالعے کے سہارے اپنے ماحول سے زیادہ سے زیادہ معلومات حاصل کرسکتے ہیں۔چونکہ اعلی تعلیم کے شعبوں کے طلبا تعلیم حاصل کرنے کے مختلف طریقے اپناتے ہیں لہذا ہم نے وارک ماڈل کے مطابق طلباء کے تعلیم حاصل کرنے کی روشوں کا جائزہ لینے کے لئے تحقیق انجام دی ہے۔ یہ تحقیق قم یونیورسٹی آف میڈیکل سائنسس میں انجام پائی ہے۔

روش: یہ تحقیق دو ہزار پندرہ میں انجام دی گئی تھی۔اس میں قوم یونیورسٹی آف میڈیکل سائنسس کے دو سو اناسی طلباء نے شرکت کی، ان کا انتخاب کوٹہ سسٹم کے مطابق انجام پایا تھا۔تحقیق میں شرکت کرنے والے طلباء کو سوالنامہ دیا گیا تھا جسے وارک ماڈل کے مطابق بنایا گیا تھا۔ ڈیٹا کا تجزیہ ایس پی ایس ایس سافٹ ویر کے ذریعے کیا گیا۔

نتیجی: اس تحقیق میں شرکت کرنے والے طلباء کی عمر بائیس یا تئیس برس تھی۔ ایم بی بی ایس میں اکثر طلباء کے اوسط نمبرسولہ اعشاریہ آٹھ پانچ اور ایک اعشاریہ چھے پانچ تھے۔ باون اعشاریہ ایک فیصد طلباء نے تعلیم کے سنگل ماڈل کو ترجیح دی جبکہ اڑتالیس اعشاریہ آٹھ فیصد طلباء نے ملئی ماڈل کو ترجیح دی۔

سفارشات: چونکہ تقریبا نصف تعداد نے سنگل ماڈل اور نصف ہی تعداد نے ملئی ماڈل کو ترجیح دی ہے لہذا سفارش کی جاتی ہے کہ مختلف روشیں اپنا کے طلباء کو تعلیم دی جائے۔

کلیدی الفاظ: تعلیم کی روشیں، وارک ماڈل، حسن سماعت و بصارت و حرکات۔

INTRODUCTION

Changes and developments such as Growing knowledge, outdating data and information and necessity of replacing them with new findings conduct human beings towards achieving specific knowledge and skills (1). An important truth is the dominant position of learning in the life of human was acquiring skills especially in education (2). Accordingly, education experts and scholars believe that optimization improvement of education quality depends on the effective learning of people (3).

Learning is a key in psychology and a very difficult concept in defining (4). However, learning style may be described as relatively stable changes of perception, interaction and adaptation of a person to the learning environment and it is such a way that learners are different in basing their personality traits, attitudes, which effect on their reaction in dealing with problems (5). This leads to different ideologies where every person may have different interests in learning styles (6). Van Wynen believes that knowing the Information processing method of students are processed by faculty and would have results in exploring an appropriate educational method and subsequently, an enhanced learning of the learners (7)

Learning is a multidimensional process which is exposed to various effective factors including teacher knowledge and enthusiasm, classroom activites, assessment activities, effective feedback and effective intraction between the teacher and the students (8). Learning styles are intricate to examine and based on the recent investigations, there are 70 learning styles available (9). This one has caused many relevant researches to be accomplished among the current study investigates VARK learning style.

VARK is a wide common learning style which was developed by *Fleming* in Lincoln University of New Zealand in 1998 (10). One of advantages of VARK style is providing information on learning strategies, educational media, and the appropriate media and aforesaid custom-made styles (11). This style based on three principles of the first maintains that everyone is able to learn academic courses and every person has its own special method. The second principle takes various techniques of learning into consideration and encourages learning. The last one attaches importance to the learning of educational content which could be carried out best adopting different senses and perceptions (12).

VARK learning style groups the students into four categories of visual, aural, read/write and kinesthetic based on their individual ability and method of obtaining the most information from environment. In visual technique, students learn most of concepts and educational contents better through observing and representing figures and charts with further explanations. Those students who prefer the aural technique enjoy discussions, lectures and oral education as new information is provided. In read/write technique, students favor oral education, reading printed or written texts, notetaking and annotating to achieve higher learning efficiency. In order to come to a deeper understanding of the content through kinesthetic technique, the students prefer to check out manipulations as well as experimental and practical examples in person (13).

The former researches made on Iranian and also other countries students introduced aural technique as the dominant method of learning (14-16), whereas a number of other studies have demonstrated kinesthetic as the most favored method by students (17-19). There are, also, people with multi-style performance who enjoy two or more abilities in learning simultaneously (13). In other conducted studies, the students preferred multi-style learning method which corroborates this more (18-20). A study by *French et al.* in 2007 in Australia indicated that kinesthetic learning style and multi-style model were preferred mostly by the students (21). Since the knowledge of learning styles is highly applicable in higher education to awareness on style and its vigilant revision, understanding and recognition of the learning concept among students, development of educational programs, and promotion of educational quality and learning theories, and also as learning styles are effective on optimization of education to students, the present study was carried out to conduct a VARK-based assessment of learning styles in the students of Qom University of Medical Sciences (22). The present study aimed to determine at Assessment of Learning style based on VARK model in the students of Qom University of Medical Sciences.

METHODS

The current study is a cross-sectional research which was performed in 2015 on 279 students of Qom University of Medical Sciences. The study population consisted of all students studying in Qom University of Medical Sciences. Based on a pilot study on 12 students and $\alpha = 0.05$, $P = 0.24$, $d = 0.04$ and power 0.9 the sample size was determined as 275 students. The students were already selected by a quota sampling method that, of 279 students, 81 students were from the Faculty of Medicine, 45 students were from Nursing and Midwifery, 79 students were from the Faculty of paramedics and 74 were from Health. Following approval of research department of School of Health in the aforesaid university and elaboration of the research purposes for the students and their consent on this, the confidentiality of personal information and maintaining the right to withdraw at any stage of research was fulfilled and the data was collected via a self-report method. In order to collect the data, a 16-item VARK Questionnaire, developed by *Fleming* in Lincoln University of New Zealand in 1998, was used (10). Validity and reliability of the questionnaire had been already confirmed by Salimi et al[23]. The scientific validity of the scale was investigated by face and content validity by six experts. The reliability of the scale after twelve eligible students filled it out (Cronbach's alpha = 0.70). Every four items of each question represented a learning situation for the learners, and the students were asked to mark any choice which describes and suits best to their performance in the respective situation. In questions where marking solely one choice was not sufficiently explanatory for the situation, the respondents were allowed to mark more than one choice. Should the choices were totally equal in two styles, the respondent was considered to possess a combined learning

were 0 and 16, respectively. The sum of scores in the first choice of all 16 questions represented visual style; the sum of scores in the second choice of all 16 questions indicated aural style; the sum of scores in the third choice of all 16 questions showed read/write style; and the sum of scores in the fourth choice of all 16 questions implied kinesthetic style. The minimum and maximum scores in the combined style were 16 and 64, respectively (23). The statistical data analysis were made through descriptive and inferential statistics using SPSS software where p<0.05 was considered as the significance level.

RESULTS

Demographic information of the 279 participating students is shown in table 1. The learning styles were effeicive with 15.66%, 14.34%, 13.24%, and 9.07% respectively for aural, read/write, visual and kenesthetic (Fig. 2). Also, 146 students (52.1%) preferred the single-modal style while 134 ones (48.8%) chose multi-modal (Fig. 1).

DISCUSSION

Findings of the present study showed that the dominant learning style among the students was aural which is consistent with those of many researches (14-16,24-26). Given the learning method of the students in this study and a number of former ones in using aural style, the main reason of this could be known sprung from educational method of teachers' lecture during school years and no change in the way up to college. Those, actually, who adopt aural learning style acquire new information usually from discussions, lectures and oral education. However, some students go ahead and set their learning technique in line with the method the faculty uses in teaching, and this, thus, suggests that learning style of students may be affected much by teaching style of faculty. Also faculty are expected to use student-oriented methods since this contributes the
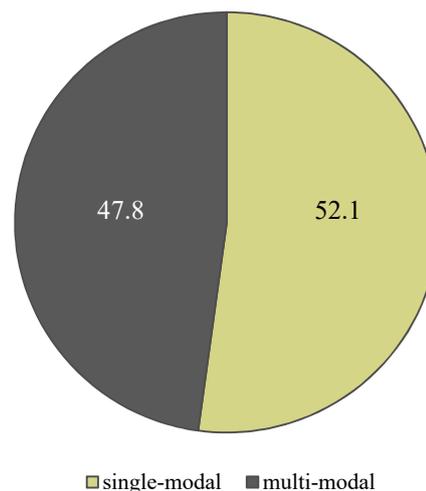
Fig. 1 Overall percentage of distribution of learning styles

single-modal ■ multi-modal

students in their learning efforts in a way that they use their knowledge in the real world based on their dominant learning style (27).

According to the results obtained in this study, the majority (52.1%) of the students preferred single-modal style which is consistent with the findings of a research by Mahan, Hamouzadeh & et. Al (17,28), while in a research that was accomplished in University of Michigan, the values were respectively 36.1% for single-modal and 43.4% for multi-modal (29) which is inconsistent with findings of the current study. The cause may be associated with the different adopted educational styles by faculty of University of Michigan to have the students involved in learning process or even the dissimilarity may come from probable difference in educational environments.

Students who use aural single-modal dominant style could learn more effectively via a simple method in classroom that is litening and then memorizing the information provided (29). Also, those who prefer multi-modal learning style may experience a more effective learning because they obtain information from various sources and use their all senses during the learning. Therefore, here the active strategy should be used for learning since these strategies take different types of learners into consideration. Class discussion, participatory learning skills, role play, and simulations are included in active learning strategies which may be used in large classes (29-31). Accordingly, faculty could use these strategies in educational settings to improve learning and develop using multi-modal styles by learners.

From among the students who preferred several learning styles in this research, 42.4% possessed two styles (bi-modal) and 5.3% used three styles (tri-modal). In the researches by Baykan et al. and Salimi et al., the most frequent learning style was bi-modal (30.2%) (23, 32, 33) which is consistent with the present study. In other researches, the multi-modal style was the most frequent style which is inconsistent with the findings of this study (34-38). This may come from foreign

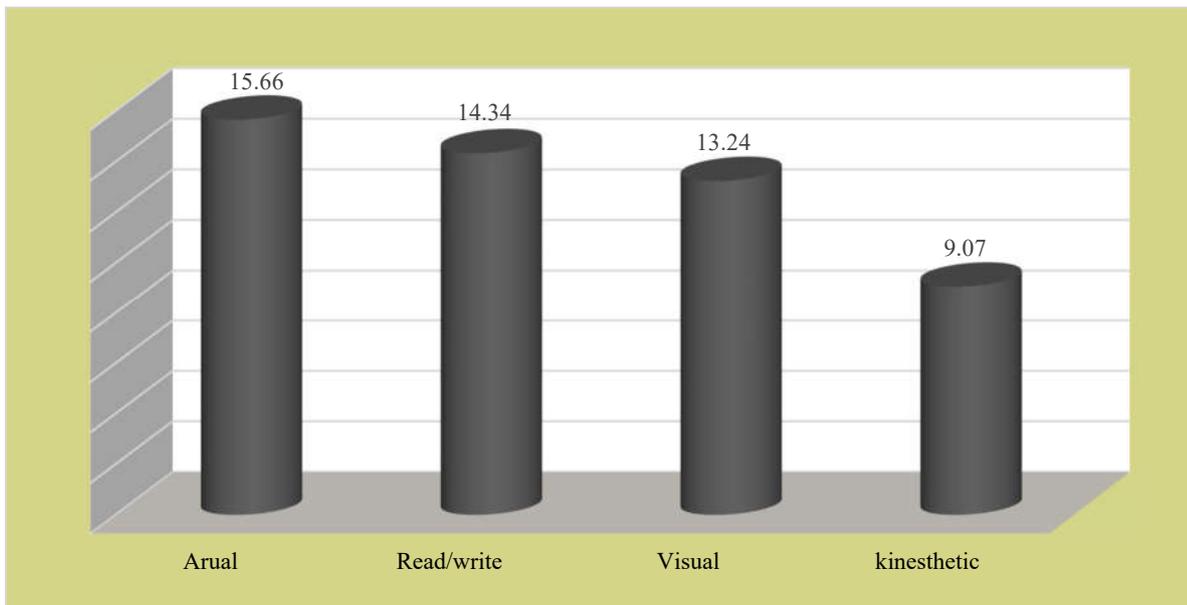| Table 1. Demographic characteristics of participants	
Variable	**Mean± SD (range)**
Age	22.23 ± 4.38(17-50)
Average	16.85 ± 1.65 (13-19.90)
	N%
Gender	
-Male	214(76.7%)
-Female	65(23.3%)
Marital status	
-Single	222(79.6%)
-Married	57(20.4%)
Faculty	
-Medicine	81(29%)
-Nursingand Midwifery	45(16.2%)
-Paramedicine	79(28.3%)
-Health	74(26.5%)

Fig. 2 Ratio of distribution of single-modal learning styles in separate given the type of style

researches in a way that the faculty in foreign universities have been successful in encouraging the students to use several learning styles usually via multi-modal teaching styles. With respect to the fact that students recollect only 20% of what they read, 30% of what they hear, 40% of what they observe, 50% of what they observe and 60% of what they perform, it seems essential to adopt the techniques which are effective on developing the learning.

One of the limitation is related to the sample bias by having unequal number of males and females. From among limitations of this study, solely one quantitative method could be referred. Since bringing changes in the research purpose make it possible to use qualitative methods such as semi-structured in-depth interviews to achieve more comprehensive results, it is advised to use it in the future studies. Also, learning styles change due to differences between teaching methods of faculty; hence, it is suggested to investigate teaching methods in different fields and compare learning styles in various universities.

CONCLUSION

The overall results of the present study showed that aural was the dominant learning style among the university students and given the findings that the majority of the students preferred the single-modal style while approximately half of them favored multi-modal, it is suggested to use combined educational methods to achieve effective teaching. It is advisable as well that changing faculty from teacher-oriented to the student-oriented methods so that the educational goals are achieved by adopting suitable teaching styles. Finally, since recognition and development of learning styles and abilities in students of medical sciences contribute enrichment of learning experiences of instructors, thus, educational departments and faculty take all needs and educational styles into consideration when developing lesson plans to improve the educational quality.

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