Learning styles of first-year medical students attending Erciyes University in Kayseri, Turkey

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Baykan Z, Naçar M. Learning styles of first-year medical students attending Erciyes University in Kayseri, Turkey. Adv Physiol Educ 31: 158–160, 2007; doi:10.1152/advan.00043.2006.—Educational researchers postulate that every individual has a different learning style. The aim of this descriptive study was to determine the learning styles of first-year medical students using the Turkish version of the visual, auditory, read-write, kinesthetic (VARK) questionnaire. This study was performed at the Department of Medical Education of Erciyes University in February 2006. The Turkish version of the VARK questionnaire was administered to first-year medical students to determine their preferred mode of learning. According to the VARK questionnaire, students were divided into five groups (visual learners, read-write learners, auditory learners, kinesthetic learners, and multimodal learners). The unimodality preference was 36.1% and multimodality was 63.9%. Among the students who participated in the study (155 students), 23.3% were kinesthetic, 7.7% were auditory, 3.2% were visual, and 1.9% were read-write learners. Some students preferred multiple modes: bimodal (30.3%), trimodal (20.7%), and quadmodal (12.9%). The learning styles did not differ between male and female students, and no statistically significant difference was determined between the first-semester grade average points and learning styles. Knowing that our students have different preferred learning modes will help the medical instructors in our faculty develop appropriate learning approaches and explore opportunities so that they will be able to make the educational experience more productive. Visual, auditory, read-write, kinesthetic; VARK; medical education; learning modes

THE TERM “learning styles,” as used in the literature during the past 30 years or so, has labeled a very broad and relatively diffuse concept (2). Keefe (2, 12) defines learning style as the “composite of characteristic cognitive, affective, and physiological characters that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment.” Educational researchers postulate that everyone has different learning styles (6, 16, 20). One characterization of learning styles is to define the learners’ preferred mode of learning in terms of the sensory modality by which they prefer to take in new information (14). Fleming and Miles (11) defined four sensory modalities of learning: visual, auditory, read-write, and kinesthetic. Visual learners prefer the use of diagrams and symbolic devices such as graphs, flow charts, hierarchies, models, and arrows that represent printed information. Read-write learners prefer printed words and texts as a means of information intake; they also prefer lists, glossaries, textbooks, lecture notes, or handouts. Auditory learners prefer “heard” information and, thus, enjoy discussions, lectures, and tutorials when acquiring new information. Kinesthetic learning is a multimodal measurement employing a combination of sensory functions. Kinesthetic learners have to feel or live the experience to learn; they prefer simulations of real practices and experiences, field trips, exhibits, samples, photographs, case studies, “real-life examples,” role-plays, and applications to help them understand principles and advanced concepts. Some learners have a preference for one of these learning modalities, whereas multimodal learners do not have a strong preference for any single method. They rather learn via two or more of the modalities (11, 21).

As medical instructors, it is our task to assess and teach knowledge, attitudes, and skills, and lectures will be more effective when the educational needs of all students are met (13, 15, 20). Student motivation and performance improves when instruction is adapted to student learning styles (1, 4, 5, 16, 21).

In the literature, numerous and diverse inventories of learning styles have been reported (2). Learning style inventories are predicated upon information-processing models that essentially aim to describe an individual’s preferred intellectual approach to assimilating information (18). One of the commonly used inventories is the visual, auditory, read/write and kinesthetic (VARK) questionnaire developed by Neil Fleming (10a). It can be used to guide instructors in their selection of learning and assessment strategies. VARK preferences can be used to help learners develop additional and effective study skills to take in information and, as a result, perform well in examinations (21).

The aim of this descriptive study was to determine the learning styles of first-year medical students using the Turkish version of the VARK questionnaire.

METHODS

This study was performed at the Department of Medical Education of Erciyes University in February 2006. The Turkish version of the VARK questionnaire was administered at the beginning of the second semester to first-year medical students to determine their preferred mode(s) of learning. All 162 first-year medical students were invited to participate in the study. The purpose of the study was explained to the students. Of the 162 students, 155 students (95.7%) completed the questionnaire. The VARK questionnaire (http://www.vark-learn.com; http://www.vark-learn.com/Turkish/page.asp?p=questionnaire) was selected because it is concise and quick to complete (only 13 questions) (10a). Each question aims to place respondents in a “learning” situation. The respondents are permitted to omit a question or to choose two or more options if appropriate. Questionnaires were evaluated on the basis of previously validated scoring instructions and a chart (10a).

A Kruskall-Wallis test was performed to determine whether an association existed between the learning style and the grade point average of the student, and a $\chi^2$-test was performed to determine whether there was an association between sex and learning style.
RESULTS

Figure 1 shows the distribution of the learning styles of the students. Of the study group, 63.9% of the students preferred a multimodal learning style.

Of the students who preferred a multimodal learning style, 99 students have different combinations of the mode of information presentation.

Of the students who preferred two modes of information presentation, 20.2% (20 students) of the students were auditory and kinesthetic, 10.1% (10 students) of the students were visual and kinesthetic, 7.1% (7 students) of the students were read-write and kinesthetic, 4.0% (4 students) of the students were auditory and read-write, 4.0% (4 students) of the students were visual and auditory, and 2.0% (2 students) of the students were visual and read-write. Of the students who preferred three modes of information presentation, 14.2% (14 students) of the students were auditory, read-write, and kinesthetic; 11.1% (11 students) of the students were visual, auditory, and kinesthetic; 3.1% (3 students) of the students were visual, read-write, and kinesthetic; and 4.0% (4 students) of the students were visual, auditory, and read-write. Of the students who preferred multimodal learning styles, 20.2% (20 students) of the students preferred all four modes of learning together.

Table 1 shows the comparison of learning styles and characteristics of the medical students.

The learning styles did not differ between male and female students ($P > 0.05$, $\chi^2 = 3.180$), and no statistically significant difference was determined between first-semester grade point averages and learning styles ($P > 0.05$).

Table 1. Comparison of learning styles and characteristics of medical students

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Visual</th>
<th>Auditory</th>
<th>Read-Write</th>
<th>Kinesthetic</th>
<th>Multimodal</th>
<th>$P$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, yr</td>
<td></td>
<td></td>
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<tr>
<td>Means ± SD</td>
<td>18.2 ± 0.4</td>
<td>19.3 ± 1.1</td>
<td>18.3 ± 1.1</td>
<td>19.1 ± 1.0</td>
<td>19.0 ± 1.3</td>
<td>&gt;0.05*</td>
</tr>
<tr>
<td>Median</td>
<td>18.0</td>
<td>19.5</td>
<td>19.0</td>
<td>19.0</td>
<td>19.0</td>
<td></td>
</tr>
<tr>
<td>Sex, % male</td>
<td>60.0 ($n = 5$)</td>
<td>75.0 ($n = 9$)</td>
<td>33.3 ($n = 1$)</td>
<td>63.9 ($n = 23$)</td>
<td>54.5 ($n = 54$)</td>
<td>&gt;0.05†</td>
</tr>
<tr>
<td>Grade point average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means ± SD</td>
<td>79.1 ± 8.6</td>
<td>72.1 ± 4.8</td>
<td>70.7 ± 6.5</td>
<td>72.7 ± 7.1</td>
<td>74.1 ± 6.4</td>
<td>&gt;0.05*</td>
</tr>
<tr>
<td>Median</td>
<td>70.1</td>
<td>70.6</td>
<td>74.4</td>
<td>72.5</td>
<td>73.0</td>
<td></td>
</tr>
</tbody>
</table>

$n$. Number of students. $P$ values were determined by a Kruskal-Wallis test (+) or $\chi^2$-test (†).
How We Learn

160 HOW MEDICAL STUDENTS LEARN IN CENTRAL ANATOLIA, TURKEY

DISCUSSION

Knowing the learning style of students is a valuable skill in education. Knowledge of learning styles may help educators identify and solve learning problems among students, thus helping their students to become more effective learners (7, 11).

In the present study, 63.9% of the students exhibited multimodality, indicating that they use a combination of learning styles when learning information. These findings are compatible with other studies (9, 14, 16) that have used the VARK questionnaire as a learning style inventory. Dinakar (9) found multimodality to be 58.0% in the caregivers of asthmatic children; Luğan (14) found it to be 63.8% in first-year medical students; Erkuş (10) found it to be 53.2% in medical students in their first 3 yr; and Murphy (16) found it to be 56.0% in dental students. Fleming (10a) has included 31,243 entries in his website, and the ratio of single to multimodal preference has been stated as 42:58 (16). In Turkey, students have to perform an examination to enter university. To win a place at a medical faculty, the grade they have to get is high. We believe that multimodal students are more successful in this university entrance examination, and, consequently, our multimodal percentage is higher than that of other studies. Further studies on medical students in all years and on students in other faculties will better explain this difference.

Multimodal students prefer information to arrive in a variety of modes. These students do not learn by simply sitting in a classroom listening to the educator, memorizing assignments (15). To achieve meaningful learning, these students must talk about what they are learning, write about it, relate it to past experiences and knowledge, and apply it to their daily lives (8, 15). In a passive lecture format, the method generally used in our faculty, all students are assumed to be auditory learners, although in the present study only 7.7% of the students were found to be single auditory learners. It is important to emphasize that students will only remember 20% of what they read, 30% of what they hear, 40% of what they see, 50% of what they say, and 60% of what they do. This average increases to 90% for information they say, hear, see, and do (19).

Studies (3, 14, 15) have shown that students learn better by using active learning strategies, because active learning strategies reach all types of learners. Active learning strategies promote thinking through reasoning and improve problem-solving and decision-making skills. In large classes, active learning strategies can also be applied. Discussion in class, cooperative learning exercises, role play, simulations, models, debates, and games are active learning strategies that can be used in larger classes (3). These activities also promote group work and generate high levels of motivation and enthusiasm. For medical students, who will always be working in team environments, these learning experiences are invaluable.

In conclusion, here at Erciyes University Faculty of Medicine, the education system is integrated, but in the first 3 years theoretical courses are administered in large classes using a passive lecture format. In a passive lecture format, all students are assumed auditory learners. In the present study, only 7.7% of the students were found to be auditory learners. Patient-based clinical education in small student groups is started in the fourth and fifth years, and students then become problem solvers and more active.

In this study, 63.9% of the students were found to be multimodal, which means that active learning strategies have to be applied to a greater extent in the first 3 years of our educational curriculum to reach all types of learners. To achieve this, we are proposing drastic reductions in passive lecture hours and preparing a more problem-based curriculum.

REFERENCES