

Original Article

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Analysis of Preferred Learning Modalities of Health Care Professional Students in a Multi-Cultural University; United Arab Emirates

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Abstract

Aims: The objective of this study was to identify the preferred learning modalities of health professional students using VARK and to compare the differences (if any) in the programs.

Settings and Design: A descriptive cross sectional survey among students of three colleges of health professional programs in RAK medical and Health Sciences University, Ras Al Khaimah, UAE

Methods and Material: A descriptive study design was conducted among a consecutive sample of 351 students from three colleges of health professional programs: Nursing (187), Medical (54) and Pharmacy (110). Following an appropriate institutional board approval and utilizing a standardized self-administered “VARK” inventory (Visual, Aural, Read/write, Kinaesthetic), version 7.8 After data collection, VARK scores were computed for each respondent and sent to the publisher for interpretation and categorization of learning preference. Other categorical variables were analysed using SPSS version 24.0.

Results: Findings showed that 126 (35.9%) were between 18-20 years, 171 (35.9%) were unimodal learners, out of which 19.1% were kinesthetic. Among the bimodal and trimodal categories, 5.98% were AK (Aural, Kinesthetic) and VAK (Visual, Aural and kinesthetic). Whereas multimodal learning modality was preferred by 70 (19.9%). Approximately 238 (67.8%) preferred TBL (Team-based learning) and 107 (30.5%) case studies/ presentations. The difference by colleges showed that most students were unimodal learners: Nursing (89%), pharmacy (58%), and medical college (24%).

Conclusions: Learning preferences was not statistically associated with demographic characteristics and program of study. Teachers can use the data to structure teaching styles to enhance learning.

Keywords: VARK learning preference, Learning styles, healthcare professional students, United Arab Emirates

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Introduction

Learning style refers to the methods through which students typically pursue the act of learning, which involves gathering, processing, interpreting, organizing, and thinking about information^[1]. Among the healthcare professional students, the preferred learning modalities significantly affect their experiences. The VARK inventory was developed by Neil D. Fleming in 1987, to help students become better learners by determining the sensory modality preferences, which could be unimodal or multimodal and to use the help sheets to incorporate strategies that would facilitate their understanding and improve performance^[2]. VARK, an acronym for (V: Visual, A: Aural, R: Read/write, K: Kinesthetic) questionnaire has been used among different study populations in undergraduate and postgraduate settings^[3]; The goal of this current study was to identify the learning preference and to determine the difference between the students of various colleges in the university.

Subjects and Methods:

This study was a descriptive cross-sectional study conducted among Nursing (RAKCON), Pharmacy (RAKCOP) and Medical (RAKCOM) students in Ras Al Khaimah Medical and Health Science University. The total population of students was 889. Using Raosoft sample size calculator, 529 students proportionally distributed by colleges at 95% confidence interval was taken. Respondents were selected using a consecutive sampling technique. The 16-item VARK inventory questionnaire was used for data collection. On the inventory, each respondent could choose more than one answer if they felt necessary for each question. Data collection lasted over a period of six months.

Institutional ethics approval was obtained (RAKMHSU-REC-153-2018-F-N), and this was followed by an internal permission from the deans of the respective colleges prior to data collection.

The survey questionnaire were distributed to respondents after a pre-briefing and full explanation about the study and the completed questionnaires were retrieved on the immediately.

After completion, the scores were calculated and entered in the columns and the publishers' 'Help' sheets were distributed. This was to help each student to identify their learning preferences based on the computed scores.

Analysis and Results:

The VARK scores were sent to the publisher to identify the type of learning preferences, subsequently, the SPSS package version 24.0 was utilized. VARK preferences are categorized as follows:

- Unimodal (V,A,R,K : mild, strong , very strong and v v strong)
- Bimodal (VA, VK, VR, AK, AR & RK).
- Trimodal (VAK, VAR, VRK, ARK)
- Multimodal: Those who do not have a standout mode with one preference score well above other scores:

- (1) VARK Type 1: Flexible in their communication preferences and tend to switch from one mode to another, depending on the task. They are context- specific and choose a single mode to suit specific occasions/situation.
- (2) VARK Type 2: The students in this group are not satisfied until they have had input (or output) in all their preferred modes. They spend time to gather information from each mode, for a deeper and broader understanding. This group may be assumed as procrastinators or slow deliverers. However, their decision making, and learning may be better because of the breadth of understanding.
- (3) VARK Transition: those who fall between VARK Type 1 and Type 2.

The response rate for this study was 66.4% (351 of 529 students). The medical students in year 2 to year 4 did not participate because they were on clinical placements outside the University. In addition, the lockdown from COVID-19 shortened the period of data collection, as students could not be accessed. From the findings the number of respondents based on colleges were RAKCON

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(187), RAKCOP (110) and RAKCOM (54). In all there were more female (85%) than male (13%), within the age range of 18-20years (35.9 %). Those over 30 years constituted only 29.3%. In terms of nationality, the participants were categorized into five groups: Arabs (122), Asians

(100), Africans (50) and others (Canada, Albania etc.)

Table 1 shows that 67.8% students preferred TBL, 52.4% preferred Quiz. The Continuous Assessment (CA) was preferred by only 34.2% of the students.

Table 1: Assessment Methods

Variables	Fr (%)	%
	Yes	No
Tbl	238 (67.8)	113 (32.2)
Quiz	184 (52.4)	167 (47.6)
Assignments	143 (40.7)	208 (59.3)
Case studies/ presentations	107 (30.5)	244 (69.5)
OSCE/ OSPE	122 (34.8)	229 (65.2)
Ca	120 (34.2)	231 (65.8)
Seminars	54 (25.4)	297 (84.6)

Table 2 shows that 19.9% preferred multimodal learning modalities (VARK type 1, type 2 and VARK transition). Out of the 171 participants in the unimodal category, 19.09 % of participants

were kinesthetic learners. Among the bimodal and trimodal preference 5.98% participants preferred AK (Aural Kinesthetic) and VAK (Visual, Aural, Kinesthetic) respectively (Figure 1)

Table 2: Learning Preferences

Learning Preferences	Frequency	%
Unimodal	171	48.7
Bimodal	59	16.8
Trimodal	51	14.5
Multimodal	70	19.9

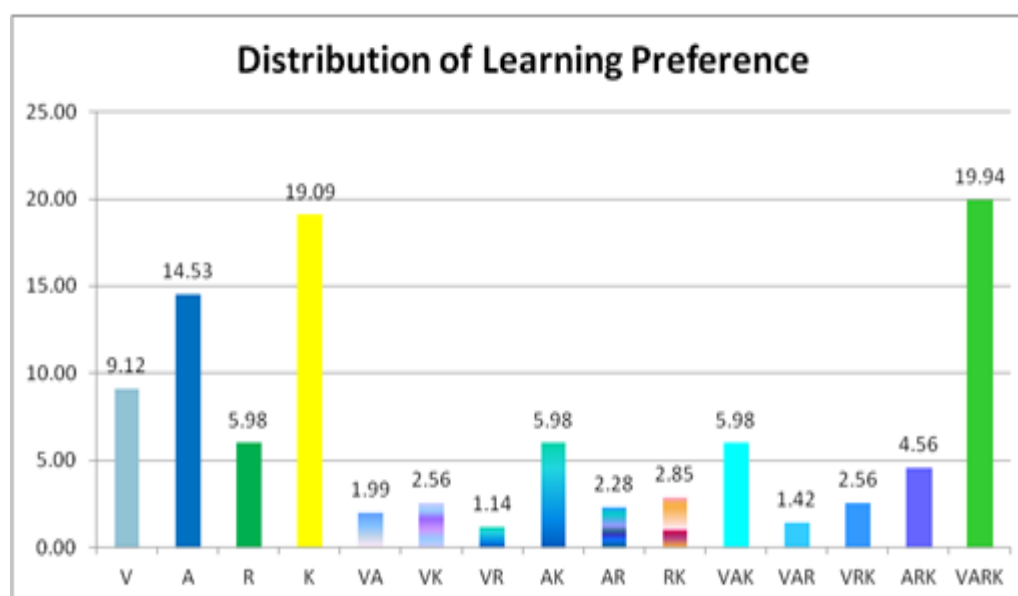


Figure 1

There is no statistically significant relationship between students of different programs and their learning Preferences ($p > 0.05$) as seen in Table 3.

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Table 3: Learning Preference by College

Learning Preference	College			Pearson Chi-square	df	P value
	RAKCON	RAKCOP	RAKCOM			
Unimodal	89	58	24	6.279 ^a	6	.393
Bimodal	35	14	10			
Trimodal	23	21	7			
Multimodal	40	17	13			

The distribution of learning preference among the colleges shows that the nursing college has the highest number of students (52.0%) with

unimodal preference (Figure 2). However, there is no statistical significance among the colleges (p value =0.393).

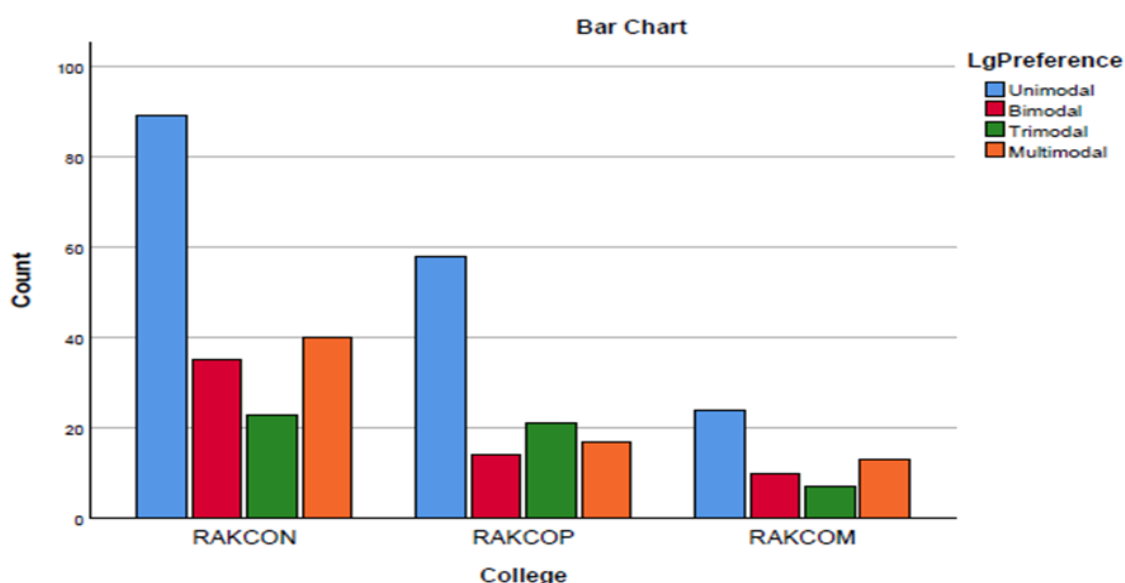


Figure 2:

It is also observed ,that the number of students aged > 30 years had multimodal preference which is higher than the other age groups, however there

is no statistically significant relationship between participants' age and the learning Preferences (p>0.05) as seen in Table 4

Table 4:

Age	Learning Preference				Pearson chi-square	df	p-value
	Unimodal	Bimodal	Trimodal	Multimodal			
18-20	61	24	23	18	16.432 ^a	12	.172
21-23	38	17	15	18			
24-26	14	3	2	3			
27-29	5	1	1	0			
>30	50	14	9	30			

Discussion:

Learning style describes how individuals navigate the process of learning and each person's

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preferred style can influence to a large extent the educational outcomes. Literature suggests that many students utilize more than one learning style^[1]. The findings of the current study suggest that students were more unimodal learners (48.7%) who demonstrate diverse preferred sensory methods to acquire information. Specifically, 19% were kinesthetic learners, which according to Fleming^[4] the students learn better through experience and practicing materials. This is particularly significant for healthcare professional students. Our findings support the conclusion drawn in an earlier study among students of Ras Al Khaimah Medical University^[5], that students preferred clinical skills to didactic lectures. The implication for teaching methodologies requires teachers to be flexible with their teaching styles and to adopt those that would support the students' learning modalities. On the contrary, Alkhasawneh^[6] in a study of nursing students in Jordan reported that 55% (n=197) preferred a multimodal learning modality, of which about 31.5% preferred kinesthetic pattern associated with visual or read/write preference. This also supports the need for more student inclusive teaching methodologies. Furthermore, in Saudi Arabia, Asiry^[7] reported that 58.4 % were multimodal learners and 41.6% were unimodal, of which 35.1% were Kinesthetic and aural modality. Yet in another study in Malaysia among medical students^[8], and^[9] among nursing students noted that respondents in each study were more unimodal learners with Kinesthetic category. These reports further support the findings of this current study.

Interestingly, most of the first-year students of Nursing, Pharmacy and Medical colleges in our study were identified to have unimodal learning preference. This is however not in agreement with the other studies conducted in the UAE. However, the unimodal learning preference in our study is higher than the previous national and international studies^{[7], [10], [11]}. According to Fleming^[12], having a unimodal preference helps the students to understand how to pinpoint the necessary corrections to enhance the learning process and retention. For students in the multimodal category, the preferences are often blurred^[12], as they utilize different modalities to achieve their goal. In a different report, Fleming

and colleague believed that choosing a particular learning strategy aligned with a modality preference is likely to lead to persistent learning tasks, a deeper approach to learning, active and effective metacognition^[13]. This suggests that educators have the responsibility to facilitate students' development and socialization, while meeting their learning needs. This can be achieved when their preferred leaning modality is identified^[14]

On the preferred methods of assessment, findings suggested a greater propensity for TBL among the study population. Team-based learning is an active learning strategy, which helps to deepen student learning through developing high-performing teams^[15]. Furthermore, TBL brings about a paradigm shift from norm where instructors have delivered information, to one where they have to create opportunities, which promotes students' engagement and participation in learning.

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