Intellectual Property Rights: Open Access
ISSN: 2375-4516

El-Aziz El Naggar, Intel Prop Rights 2016, S1
DOI: 10.4172/2375-4516.S1-011

Research Article Open Access

Identifying and Comparing Learning Styles Preferences among Medical Undergraduates Students at College of Medicine Aljouf University

Marwa Ahmed Abd El-Aziz El Naggar*

Medical Education Department, Faculty of Medicine, Suez Canal University, Egypt, Al Jouf University, Kingdom of Saudi Arabia

Abstract

Background: The (FOM-JU) adopted Problem-Based Learning as the main educational strategy, school implement many instructional methods. To develop pedagogical strategies medical teachers need to know the preferred learning styles of their students. Medical education researchers aware that using a variety of teaching methods improve the retention, use, accessibility of knowledge, as well as enhance students' adaptability in problem-solving situations enhance deep learning (1).

Aim: The aim of this study was to identify and compare students learning styles in basic sciences (1st, 2nd and 3rd years) phase and clinical (4th and 5th years) Phase at the faculty of medicine Aljouf University, and to compare learning styles differences between female and male students. Suggest suitable learning resources that will be more beneficial to students learning styles.

Methodology: A comparative design was applied in this study. Comprehensive sample was taken from medical students both preclinical -clinical students with male 159 and 48 female (n=207) was performed. The validated VARK questionnaire was used. The questionnaire consists of 16 items which identify four learning styles; visual, auditory, reading/ writing and kinesthetic. Descriptive analysis were first used to identify the learning styles of students, then comparative analysis was used to compare learning styles preferences between male and female students and between basic and clinical phases students. VARK questionnaire was distributed to all students in male and female sides, for all years (first and second year female side and first, second, third, fourth and fifth years male side).

Results: Results showed that 72.9% of female and 71.1% of male students preferred to learn by a multi-modality (visual, auditory, reading/writing, or kinesthetic). Results also shows that 40.67% of the male students in clinical years prefer one mode of the learning style preferences, while 44% of female and male students in basics sciences phase in FOM-JU prefer to learn by two modes of the learning style preferences. It also shows that 13% of the male students prefer kinesthetic mode of the learning style preferences, comparing to 4.1% of female students are tactile learners in in basics sciences phase.

Conclusion: The study concluded that majority of FOM-JU students prefer multimodal style. Results of this study also conclude that there is a difference between clinical and basics sciences year in learning styles preferences.

Keywords: Learning style; VARK questionnaire; Learning preference; Educational strategies and college of medicine

Introduction

Educational psychologists study how human beings learn; actually, no two students will learn the same things the same way. Every students has his dominant learning style [1]. Learning is the development of new knowledge, skills, or attitudes when the individual interacts with information and environment [2]. How medical students learn may have special implications for teaching and learning in the medical curriculum, particularly in activating and sustaining motivation. Different types of people have different ways of learning, known as their learning style [3].

Educators trying for a long time to determine a model that adequately describes the differences in how people learn. A learning style is the way in which a learner perceives, interacts with, and responds to the learning environment [4]. Knowing students' learning style helps to overcome to treat all students in a similar way as well as motivate teachers to move from their preferred mode to using others. There is a clear trend in university education to instruct all students in the same way, most commonly the straight didactic lecture format. Teachers use lecture format because of the relative ease of information transfer, the need to cover the content, sense of control, a long history of traditional teaching, and perhaps due to their own preference of learning [1]. Learning styles are defined as the "manner in which individuals choose to approach learning situation," ie, the behaviors and processes people use to acquire new knowledge [5]. Learning styles is personal characteristic cognitive, affective, and psychological behaviors that influence a learner's ability to attain information and interact in the learning environment [2]. Learning styles can be used in any environment where people interact. Learning style is defined as 'a person's typical modes of perceiving, remembering, thinking and problem solving'.

Recently, educators have started to explore the characteristics of learning styles of students that will enhance learning. Understanding the "learning styles of students has a wide range of possible applications in education" from classifying the learning preferences of students

***Corresponding author:** El Naggar M, MHPE, PhD Medical Education, lecturer, Medical Education Department, Faculty of Medicine, Suez Canal University, Assistant Prof. Medical Education, Faculty of medicine Al Jouf University. Kingdom od Saudi Arabia (KSA), Tel: 00966598668032; E-mail: marwanagar@yahoo.com

Received October 10, 2016; **Accepted** November 23, 2016; **Published** November 30, 2016

Citation: El-Aziz El Naggar MAA (2016) Identifying and Comparing Learning Styles Preferences among Medical Undergraduates Students at College of Medicine Aljouf University. Intel Prop Rights. S1: 011. doi: 10.4172/2375-4516.S1-011

to detecting potential learning problems at an early stage in order to choose the appropriate teaching methods [3]. Many studies of learning styles conducted in the field of higher education. Although the studies classify different learning types and/or styles in different ways, their aims and approaches are similar. That since the instructional approaches around the cycle of learning models are similar, it is not important, which learning style instrument has been chosen. Among the various learning style theories,

It is also important to know the way you prefer to learn or process information. Although most people are born with all five senses, three of these are used more dominantly in the learning process [6].

Visual learners acquire information visualizing something; they will learn it and remember it better. They learn best by watching television or videos, draw concept map or mind tree; they like to read books, magazines and newspapers. Visual learners are most likely to forget what they cannot picture in their minds. They have photographic memory. They prefer to specialize as dermatologist.

Auditory learners listening attentively to people talk and can learn important points in lectures. Auditory people seem also to catch specific sounds like heart and lung sounds. They remember sound quickly, they prefer to specialize as cardiologist.

Tactile learners acquire their knowledge through movement or touch. These experimental learners like to work on activities. They prefer group work like project based learning, problem based. They are more likely to remember a process by accomplishing it themselves than just seeing or reading about it. They prefer to specialize as surgeons and obstetrician/gynecologist.

Read and write learner acquire their knowledge through reading and writing. They prefer to write a assignments, take history from patients. They prefer to specialize as psychiatric [7].

Some people may use all of the senses equally in learning and they are independent learners. They have the advantage of being able to focus in any situation. These people work alone, take charge, and work fast [8].

An individual's learning style is made up of three factors: cognitive (how they learn), affective (what motivates their learning), and physiological (how they respond to their environment).

Many factors can influence student learning styles. These factors are: gender, age, academic achievement, brain processing, culture and creative thinking [9].

Supporters of learning style-based education see it as a means to meet the needs of learners as individuals. They feel that learning styles allow the learner to work with their individual strengths and weaknesses by getting to know themselves and their attitudes to learning [6].

Effective teaching in medicine requires flexibility, energy and commitment amidst a busy background of clinical care. Successful medical teaching requires teachers to address learners' needs and understand the variations in learners' styles and approaches. Teachers can accomplish these requirements while creating an optimal teaching-learning environment by utilizing a variety of teaching methods and teaching styles. If teachers use a variety of teaching methods and styles, learners are exposed to both familiar and unfamiliar ways of learning that provide both comfort and tension during the process, ultimately giving learners multiple ways to excel. As Honigsfeld 2001 and his colleagues have suggested new instructional methods are critical as medical school curricula are changing. Others have mentioned the importance of using a variety of creative, nontraditional teaching techniques and strategies in clinical teaching [10].

Approaches to Learning at Faculty of Medicine Aljouf University (FOM-JU)

FOM-JU undergraduate curriculum emphasis on developing students' higher-order thinking skills including critical thinking, creative thinking, clinical reasoning, metacognitive and self-regulation skills, affective, communication and social skills. Through adapting, many educational methods like Problem-Based Learning, community based/ oriented learning, Team Based Learning, seminars, clinical skills lab, field visits, interactive lectures, small group discussion, case based learning, and blended learning (e-learning) using blackboard, virtual class rooms, and discussion forum.

Methods

Setting and participants

Comparative study was conducted in 2016. Both female (first , second year) and male (1st, 2nd, 3rd. 4th, and 5th years) volunteers students 207 students were participating in this research (48 female, 159 male) 23.18% females, 76.81% were males. Response rate was 73.84%.

Data collection tool

Version 7 of the VARK questionnaire was used. The questionnaire measures four perceptual preferences (V, A, R and K). Satisfactory levels of reliability and validity of the VARK have been reported using factor analysis techniques. It consists of 16 questions with four options each. The purpose of each question is to categorize the learning style preferences of respondents, then comparing between male/female and basics and clinical years in male side, as we did not have female students in clinical years yet. Students can choose more than one option for identifying the preferences for multiple learning styles.

Procedures

In 2016, we distributed the VARK questionnaire to Al Jouf medical students after lectures in time of self-directed learning (SDL) asked students to complete the questionnaire and return it to the investigator in female side. I explained that the VARK questionnaire was designed to measure the distribution of learning styles preferences of students and that we would use the study findings for research purposes. The study was approved by research committee at FOM-JU, Sakaka, Saudi Arabia.

Statistical analyses the distributions of the VARK preferences were calculated in accordance with the guidelines given in the VARK website. Descriptive statistics were used for each VARK component. To calculate the percentage of students for each VARK component the number of students who preferred each learning style modality was divided by the total number of students (n=207). Then comparative statistic was used to compare learning styles preferences between male and female students and basic and clinical phases.

Results

Demographic data

Total number of 207 students participate in this study, 159 male (76.81%), 48 female (23.18%). Male to female ratio was 3.3:1. Number of students in clinical phase 59 (28.5%), 148 students in basics sciences (71.49%). In our study, the response rate was 73.84%.

Learning styles

Mean and standard deviation for each VARK component are presented in Tables 1 and 2.

Figure 1 illustrates that 8.3%, 6.3%, 8.3%, and 4.2% of female students only preferred the visual, aural, reading/writing and kinesthetic modes, respectively. This simply indicates that 72.9% of female students preferred to learn by a multi-modality (visual, auditory, reading/writing, or kinesthetic).

However, a further analysis showed that 35.41% of FOM-JU female students (preferred to learn by bi modalities, 27.8%, 20.8%, 16.6% were uni-modal, tri-modal and multimodal, respectively (Figure 2).

Figure 3 illustrates that 6.3%, 7.5%, 2.5%, and 12.6% of male students only preferred the visual, aural, reading/writing and kinesthetic modes, respectively. This simply indicates that 71.1% of male students preferred to learn by a multi-modality.

Further analysis showed that 36.47% of FOM-JU male students (preferred to learn by bi modalities, 19.49 %, 28.9%, 15.10% were uni-modal, tri-modal and multimodal, respectively Figure 4.

Comparing male and female students learning styles

Figure 5 illustrates that vast majority of male and female students in FOM-JU prefer to learn by multi-mode, 71.1% male and 72.9% of female students prefer to learn by more than one mode of the learning style preferences.

Figure 6 illustrates that both male and female students in FOM-JU prefer to learn by two mode, 36.41% male and 35.41% of female students prefer bimodal of the learning style preferences.

Figure 7 illustrates that 40.67% of the male students in clinical years prefer one mode of the learning style preferences, while 44% of female and male students in basics sciences phase in FOM-JU prefer to learn by two mode of the learning style preferences.

SD	Mean	VARK
6.7	13.6	Visual
5.6	14.0	Auditory
3.4	13.1	Reading/Writing
7.4	18.4	Kinesthetic

Table 1: Mean and standard deviation for the VARK questionnaire administered to 207 medical students at Al Jouf Medical College, Aljouf University, Sakaka, Saudi Arabia, 2016.

Male		Female		VARK
SD	Mean	SD	Mean	
4.9	14.8	10.6	10.5	Visual
5.3	15.6	5.7	10	Auditory
4.3	13.8	2.1	11.5	Reading/Writing
6.9	21	5.7	12	Kinesthetic

Table 2: Comparing Mean and standard deviation for the VARK questionnaire administered to 48 female, 159 male medical students at Al Jouf Medical College.

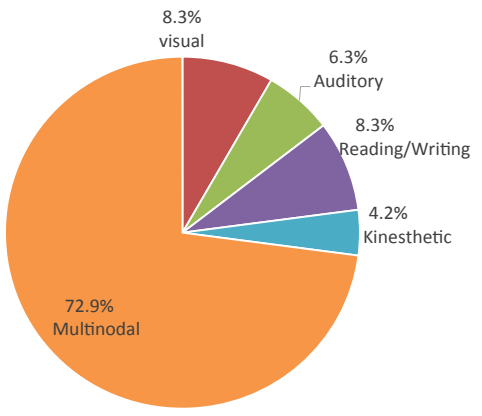

Figure 1: The percentages of FOM-JU female students with singular and quadrimodal learning preferences (n=48).

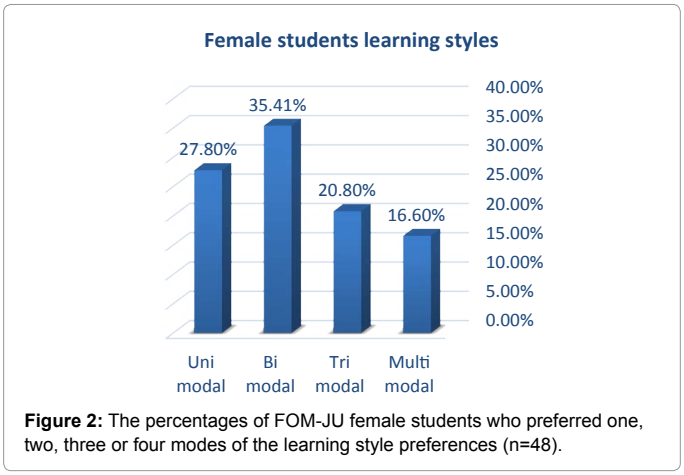

Figure 2: The percentages of FOM-JU female students who preferred one, two, three or four modes of the learning style preferences (n=48).

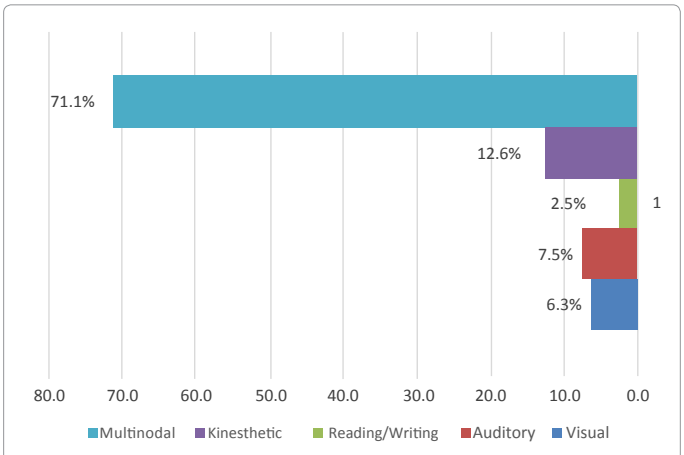

Figure 3: The percentages of FOM-JU male students with singular and qudri-modal learning preferences (n=159).

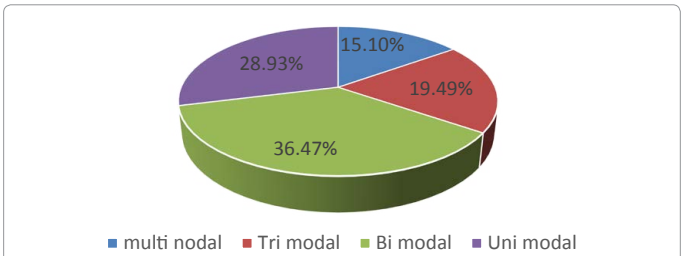

Figure 4: The percentages of FOM-JU male students who preferred one, two, three or four modes of the learning style preferences (n=159).

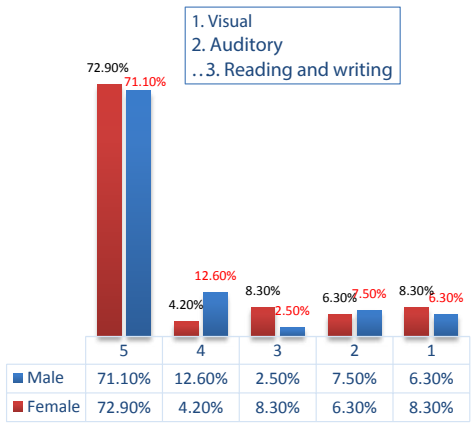

Figure 5: Comparing percentage of FOM-JU male/ female students who are visual, Auditory, reading/writing, kinesthetic and Qudri-modal of the learning style preferences (male n=159, female n=48).

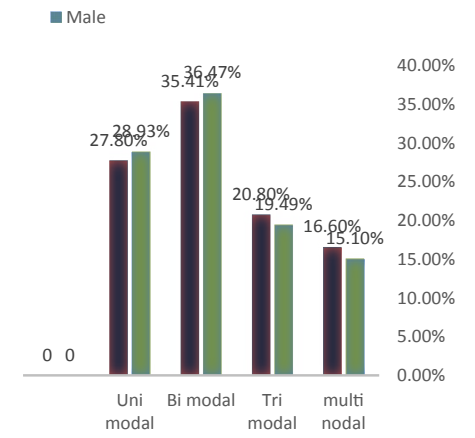

Figure 6: Comparing percentage of FOM-JU male/ female students who preferred one, two, three or four modes of the learning style preferences (male n=159, female n=48).

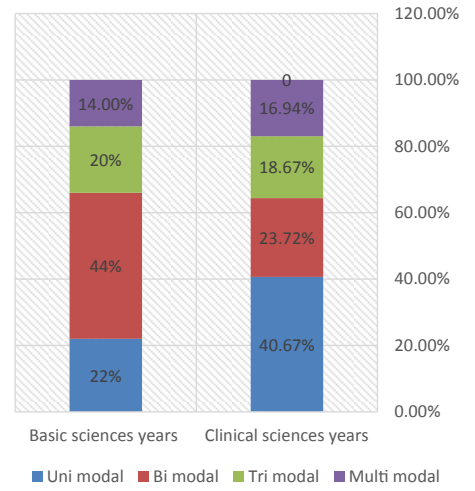

Figure 7: Comparing percentage of FOM-JU students in clinical and basics phases who preferred one, two, three or four modes of the learning style preferences (Clinical phase n=59, Basics phase n=148).

Comparing uni-modal preferences in clinical and basics sciences years in male section; Figure 8 shows that 11.90% of the male students in clinical years prefer to learn by using their hands (kinesthetic mode of the learning style preferences), comparing to 13% in basics sciences phase (Figure 8) also shows that 13.6% of the male students in clinical years prefer visual mode of the learning style preferences, comparing to 4% in basics sciences phase.

Comparing uni-modal preferences between male and female students in basics sciences years; Figure 9 shows that 8.30% of the female students in basics sciences years prefer reading and writing mode of the learning style preferences), comparing to 2% in males in basics sciences phase (Figure 9) also shows that 13% of the male students prefer kinesthetic mode of the learning style preferences, comparing to 4.1% of female students in basics sciences phase.

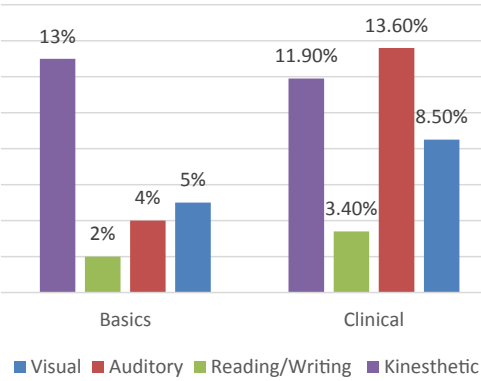

Figure 8: Comparing percentage of FOM-JU male students in clinical and basics sciences phases who preferred uni-modes of the learning style preferences (Clinical phase (male) n=59, Basics phase (male) n=100).

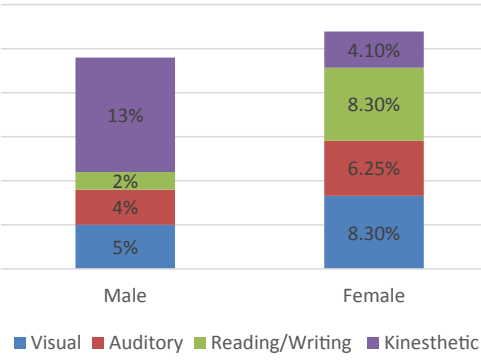

Figure 9: Comparing percentage of uni-modes of the learning style preferences among FOM-JU male and female students in basics sciences phases (male n=100, female n=48).

Discussion

The main aim of this study was to identify learning styles preferences in FOM-JU in both female and male sections, then compare if there is any differences between male and female students. As we use the same educational methods in both sections like community based/ oriented learning, Team Based Learning, seminars, clinical skills lab, field visits, interactive lectures and blended learning (e-learning) using blackboard. with same staff. We want to be sure that our educational resources fit with our students learning preferences. Saudi students in

high schools depend mainly on their teachers in providing information and directing them to the objectives. Students are test wise, the huge shift that occur in university life shift them from just passive receive of information to active self-directed learner. FOM-JU use small group tutorial in Problem Based Learning sessions, as well as team based learning, students have to identify their learning gap and search for the information needed by using many available resources, tutors work only as facilitator's monitors students' progress. Students become active learners and responsible for controlling their learning activities.

We aim to increase learner's self-awareness about their learning styles preferences, increase learner's range of learning strategies, this will guide medical education department to help learners accommodate various instructional delivery systems, we hope that this will increase learner motivation, self-confidence, enhance decisions making regarding selecting suitable educational resources. Enhance students' metacognitive skills. By identify and being aware of their learning styles, student will use deep-level processing of information this will enhance the quality of learning outcome.

Results help us to gain an understanding of the learning preferences of Saudi medical students in FOM-JU.

Results shows that the Mean VARK scores for kinesthetic learners (18.4) were more than that for aural (14), visual (13.1) and reading/writing learners (13.6), this may because students in FOM-JU have early hands on training in safe learning environment in clinical skills lab; that start in first year as a longitudinal course run through three basics years. As well as early patients exposure in primary Health care centers. As Saudi Arabian students are heavily involved in new technology. Results in our study matches with a study in King Saud Bin Abdul Aziz University for Health Sciences, King Fahad Medical College, Saudi Arabia; the Mean VARK scores for aural (6.6) and kinesthetic learners (6.4) were more than that for visual (5.3) and reading/writing learners (4.7) (11).

Majority of female and male students prefer multi nodal learning styles, female 72.9% as well as male 71.1%. Our results are in agreement with that has been reported for American medical students, as well as study conducted by Samarakoon et al., 2013 (12), in Colombo among medical undergraduate students they found that majority of their students preferred multi nodal learning style 69.9% in first year, 67.5% in the final year.

Comparing between male and female students learning styles preferences the results shows that both male and female students prefer bimodal learning styles. There is a differences between male students in first year and final year, 50%, 21%, 16% and 13% of first year students prefer bimodal, uni-modal, tri-modal, and multimodal respectively, comparing with final year students who prefer 41.9%, 22.58%, 19.63% and 16% uni-modaL, tri-modal, multi modal, bimodal respectively. Unfortunately, despite that, FOM-JU adapted integrated system based curriculum, students learn through modern learning and assessment methods like problem based learning sessions, team based, small group discussion, project based learning, clinical simulation using simulated models, patients, students in the final year prefer only one modality of learning mainly visual.

Female students are mainly visual and well as read and write (8.3% both) comparing with male students who are predominantly kinesthetic (13%). In a study held in Netherland identify learning styles and preferences for live and distance education, they found that 83% of the students are visual. Visual learners remember best what they see: pictures, diagrams, flow charts, time lines, films, demonstrations, and all the symbolic arrows, circles and concept map, mind tree. Learners may still prefer specific ways to learn new material; however, they may be able to approach different kinds of tasks with more strategies and less apprehension.

Study results shows that students both male and female are mainly bimodal 44% in basics sciences phase, they shifted to be mainly unimodal in clinical phase 40.67%, in clinical years students prefer auditory mode (13.6%) comparing 13% of basics science students are mainly kinesthetic. This result was somewhat astonishing; as we was think that students in clinical phase depend on their hands to learn. Our study shows that clinical students more auditory and kinesthetic learner, this may be explained by study in this phase use case based learning strategy as the main educational method they take history from the patients and discuss the case with their teachers, use role play scenarios, small group discussions to teach clinical cases in word. They use their hands in examining the patients; find the signs of the diseases under supervision of the clinical teachers, use standardized, simulated and real patients, manipulating high vitality models. This result was concordant with the results of study held in KSA that shows the Mean VARK scores for aural (6.6) and kinesthetic learners (6.4). Auditory learners remember much of what they hear and then say. They benefit of discussion, prefer verbal explanation; learn effectively by explaining things to others. Concluded "that the idea that 'style awareness' may help reach the 'hard to teach', and perhaps contribute to reducing failure generally". From the results of the study we should emphases on the method that satisfy our students' learning styles in clinical years by allow for written words, as well as spoken words (sound). Also, allow learner to write points learned in own words. Group discussion using discussion board and Internet relay chat to write own understanding and see others' explanations. As FOM-JU use the same educational methods for both male and female students in both sections, results of our study conclude that college have to adjust educational methods between male and female in basics sciences years as female students are mainly visual, read/write and male students are mainly tactile (kinesthetic). FOM-JU started to use blackboard in teaching its students, but we are not sure that using a new online learning method using blackboard, with online lectures, virtual class rooms affect our students' learning styles or not?

Conclusion

The results of this study conclude that majority of FOM-JU students prefer multimodal style. There is a difference between clinical and basics sciences year in learning styles preferences, Therefore faculty members should have access to the learning styles information of students they teach so that teaching styles could be matched to the majority of students' learning style needs.

Conflict of Interest

The authors declare that they have no conflict of interest.

Limitation

We did not identify and compare learning styles of the faculty members and students. We want to answer the question did learning-style preferences of faculty members influence their teaching styles and student learning? In addition, we need to assess whether designing FOM-JU educational curricula and strategies is accommodate different learning styles or not. More research is needed to be undertaken to confirm the association between learning style preferences and teaching and learning methods.

References

1. Lujan LH, DiCarlo SE (2006) First-year medical students prefer multiple learning styles. Adv Physiol Educ 30: 13-16.
2. Clare Kell, Robert Van Deursen (2002) Student learning preferences reflect curricular change. Medical Teacher 24: 1.
3. Burdett S (2009) What's your style. Journal of Audiovisual Media in Medicine 24: 70-74.
4. Van der veken J, Valcke M, Muijtjens A, De maeseneer J, Derese A (2008) The potential of the inventory of learning styles to study students' learning patterns in three types of medical curricula. Medical Teacher 30: 863-869.
5. Marx RW, Blumenfeld PC, Krajcik JS, Fishman B, Soloway, et al. (2004) Inquiry-based science in the middle grades: Assessment of learning in urban systemic reform. Journal of Research in Science Teaching, 41: 1063-1080.
6. Honigsfeld A (2001) A comparative analysis of the learning styles of adolescents from diverse nations by age, gender, academic achievement level and nationality. The Humanities and Social Sciences 62: 969.
7. Rassool GH, Rawaf S (2008) The influence of learning styles preference of undergraduate nursing students on educational outcomes in substance use education. Nurse Education in Practice 8: 306-314.
8. Baraz S, Memarian R, Vanaki Z (2014) The diversity of iranian nursing students' clinical learning styles: A qualitative study. Nurse Education in Practice 14: 525-531.
9. Lkhatnai M (2011) Learning styles of EFL saudi college-level students in on-line and traditional educational environments (Order No. 3453565). Available from Education Database.
10. Groenwold RHH, Knol MJ (2013) Learning styles and preferences for live and distance education: An example of a specialisation course in epidemiology. BMC Medical Education 13: 93.
11. Nuzhat A, Salem RO, Quadri, MSA, Al-Hamdan N (2011) Learning style preferences of medical students: A single-institute experience from saudi arabia. International Journal of Medical Education 2: 70-73.
12. Samarakoon L, Fernando T, Rodrigo C (2013) Learning styles and approaches to learning among medical undergraduates and postgraduates. BMC Medical Education 13: 42.

Citation: El-Aziz El Naggar MAA (2016) Identifying and Comparing Learning Styles Preferences among Medical Undergraduates Students at College of Medicine Aljouf University. Intel Prop Rights. S1: 011. doi: 10.4172/2375-4516.S1-011