

Learning Styles of Nursing Administration Students and Their Teaching Mode Efficiency

Abeer Abd El Fattah Abou Shousha¹; Reem Mabrouk Abd El Rahman²

¹Nursing Education Department, Faculty of Nursing - University of Damanhour

²Nursing Administration Department, Faculty of Nursing - University of Damanhour

abirshosha@yahoo.com; r_mabrouk@hotmail.com

Abstract: Background: Despite a significant amount of research focusing on learning styles in many disciplines of education, there is a limited amount on nursing education. The National League of Nursing core competencies recommended that educators should identify learning styles in nursing students. This will help in designing curricula, and adopting teaching methods needed for lifelong learning. **Aim of the study:** to examine the learning styles of nursing administration students and their teaching mode efficiency at Damanhour Faculty of Nursing. **Material & methods:** a comparative cross-sectional study design was adopted to carry out this study. The study was conducted at Faculty of Nursing in Damanhour. Total sample was 353 nursing students registered at the course of nursing administration: 171 students at the third year, and 182 at the fourth year. Two tools were used to collect the necessary data, it consisted of three parts: VARK assessment sheet; Student's Feedback on Teaching Strategies instrument; and the demographic sheet. Data were analyzed using percentages, Pearson Chi-square, and Mont Carlo exact probability. **Results:** the findings of this study revealed that above half of the nursing administration students had a preferred one learning style; followed by the bimodal learning style. As for teaching mode, integration got the highest percentage compared to tutorial, practical and lecture modes. There was a statistically significant relationship between learning style and year of study; however, there was no statistical significant relationship between learning style and gender. In assessing the relationship between learning style and teaching mode, there was no significant relationship. **Conclusion:** with the rising demand for nurses, the need to retain the students in nursing programs is essential to meeting demand. Learning can be effective if teaching strategies enhance a student's ability to learn, not hinder it. This challenge can become an opportunity to affect positive social change through the development of new educational strategies, increased nursing graduates, and a greater opportunity for nurse educators to meet the demands of an ever changing healthcare environment. **Recommendations:** educators should identify learning styles early upon admission into nursing programs through the administration of learning style inventories; and incorporate understanding of learning styles into retention strategies. The nurse educator should also investigate if there is an association in learning style and those students who are unsuccessful in the nursing program.

[Abeer Abd El Fattah Abou Shousha and Reem Mabrouk Abd El Rahman. **Learning Styles of Nursing Administration Students and Their Teaching Mode Efficiency.** *Life Sci J* 2014; 11(2s):236-245]. (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 38

Key words: learning styles, teaching mode, nursing administration students, VARK.

1. Introduction

The National Health Care Agenda directs the efforts of nursing programs to increase retention and success of diverse students (Emerson & Records, 2008). Since a diverse environment is vital to the academic goals of many institutions, strategies that maximize the potential for success of diverse students need to be tailored to fit each individual's unique preferences for learning (Evans, 2008). The National League for Nursing (NLN) (2005) core competencies for nurse educators states that educators must facilitate current student development and socialization by determining individual's unique learning style preferences and needs in the culturally diverse world. Taken into consideration shortage of nurse faculty and increasing class sizes, nurse educators are challenged to identify learning style preferences and develop suitable learning experiences which will meet the

complex needs of the current nursing student (Ironside & Valiga, 2006; Fountain & Alfred, 2009). Learning style preferences should be clarified early in the undergraduate nursing curriculum with the hope to foster students' use of their knowledge about learning style preferences to attain positive outcomes (Holstein *et al.*, 2006); especially in large classes where students at risk may go unnoticed (Burruss, 2010).

Many researches focused on learning styles and the promotion of effective learning environment for many decades (Terry, 2001). Vorhaus (2010) defined learning style or preference as: "an individual's preferred mean to learn; it is how an individual learns, perceives, interacts with, and responds to the learning environments". Moreover, Felder and Brent (2005) considered learning preference or style as: "how the brain works most efficiently to process, comprehend, and learn new information". Variations in definition

tend to reflect the perspectives of different learning style inventories, which seek to assess learning preferences using a number of strategies (Burruss, 2010). Verster (2010) indicated that students' learning styles will be influenced by their genetic make-up, their previous learning experiences, their culture and the society they live in. Learning preferences are about the ways that people want to interchange information, either visually, auditory, tactile, and kinesthetic (Felder & Brent, 2005; Fleming, 2010). This will empower students to facilitate their intent to use the information, which may be a catalyst capable of igniting student success (Burruss, 2010).

Theories of learning style have been cited as an effective ways for helping teachers recognize the numerous diverse needs students bring into the classroom which provide a platform that enables teachers to knowledgably develop a variety of instructional methodologies to benefit all students for the goal to develop lifelong learners (Williamson & Watson, 2007). Fleming (2008) suggested four classifications that indicate the sensory modalities used to present information, as an acronym "VARK", namely: Visual (V), Auditory (A), Read/write (R), and Kinesthetic (K). The VARK focused on the means by which people like information to be delivered to them and the means by which they liked, in return, to deliver their communication (Fleming, 2008). The NLN's certified nurse educator preparation workshops and examination information suggested the VARK as one way nurse educators could investigate learning styles (NLN, 2009). Each preferred style has several specific characteristics that contribute to learning, from which each individual tends to use them when they learn; for example, individuals with a visual style prefer to learn mostly through 'sight'; they often think in pictures and learn best from visual displays; whereas, those with an auditory learning style will benefit most from listening to lectures, speeches and oral sessions, as they tend to hear an explanation of something rather than to read about it; while, individuals with read and write learning style convert use writing and drawing as memory aids and learn well in hands-on activities like projects; lastly, individuals with a kinesthetic learning style tend to do a physical activity and be active rather than listening to a lecture or merely watching a demonstration (Murphy *et al.*, 2004; Verster, 2010).

Student's learning style is vital for the student and the teacher as well, as it will determine how student will comprehend and process information, and consequently enhance learning of nursing students (AlKhasawneh, 2013). Learning to study based on how student's brain takes in information can lead to increased confidence (Meehan-Andrews, 2009), better meet student needs while facilitating learning (Brown

& Pluske, 2007), increase self-efficacy (Shannon, 2008), and can help educators create a positive learning environment that is both challenging and supportive (Loyola, 2010). Teaching strategies also varies greatly; therefore, teachers must understand that students vary in their learning styles and it is imperative to implement different teaching styles to adapt and match students' styles (Meehan-Andrews, 2009). Incorporating different strategies and teaching styles in the lesson plan; in order to boost teaching effectiveness, will occur if teachers match their teaching styles with students learning style, leading to comprehension and retention of its content (Salehi & Shahnnooshi, 2007). Learning preferences can help individuals start to understand their needs, and rationalize their choice of teaching methods suitable for themselves; additionally, it can help design a nursing curriculum that might reflect some aspects of the various backgrounds of nursing students, which in turn might stimulate the preparedness and readiness of graduates who are competent, confident with appropriate background in knowledge of science in the profession (AlKhasawneh, 2013).

Teaching generally involves different teaching strategies, such as lectures, which have traditionally been viewed as a very inexpensive way of presenting new ideas and concepts to a large group of students, and to promote an interest in the subject (Meehan-Andrews, 2009). However, lectures rarely stimulate student thinking and get information beyond short term memory of students (Ramsden, 2003). Tutorials, or small group learning, traditionally provide students with the opportunity to engage with course material at a non-clinical environment; its experience can support and encourage a deep approach to learning in the subject as students are encouraged to participate in class activities and discussion (Meehan-Andrews, 2009). However, tutorials can pose real problems with student 'passivity, anxiety, repetitive activity and silence' (Ramsden, 2003). Practical or clinical based learning, which requires students to follow instruction to perform procedures, record observations, analyze and interpret data (Hazel & Baillie, 1998). Most practical classes have been designed to reiterate themes introduced in lectures (Meehan-Andrews, 2009). The use of practical classes is constantly being reviewed due to increasing cost and reduced availability of resources (Ramsden, 2003). Lastly, integration which uses more than one of the previously mentioned teaching strategies (Meehan-Andrews, 2009).

The evidence suggests that through improving students' awareness of their own learning style, they are better able to take responsibility for their own learning, which leads to positive learning outcomes (Fritz, 2002). Exploration of teaching strategies in

connection with individual learner preferences is a vital activity in maintaining and improving the quality of an educational program, which would lead to enhanced future learning opportunities and outcomes and could have a positive impact on nursing staff recruitment and retention for the organization involved (Heath, 2001). Despite conducting studies on learning styles of nursing students globally, the concept of learning styles still holds appeal for educators (Bishka, 2010; Martin, 2010; Scott, 2010). On the other hand, a lack of research on nursing students' learning styles and their teaching mode is found in Egypt. Therefore, this study, as few on nursing students' learning styles in Egypt, aimed to examine the learning styles of nursing administration students and their teaching mode efficiency at Faculty of Nursing, University of Damanhour.

2. Research aim and questions

The aim of this study was to examine the learning styles of nursing administration students and their teaching mode efficiency at Faculty of Nursing - University of Damanhour.

The research questions for this study were: What are the learning style(s) preferences of nursing administration students at faculty of nursing ?

What are the teaching mode(s) preferences of nursing administration students at faculty of nursing ?

2- Is there a relation between learning styles and teaching modes?

3. Material and Methods:

3.1 Research design:

This is a comparative cross-sectional study.

3.2 Setting

The study was conducted at Faculty of Nursing - Damanhour University (Egypt).

3.3 Subjects

The study subjects included all nursing students who were enrolled, at the academic year 2012-2013, in nursing administration course, at the third and fourth year of Bachelor of Nursing Sciences program (N = 353).

3.4 Tool for data collection

The data was collected through self-administered questionnaire containing three major parts:

3.4.1 Part I:

The VARK Questionnaire (Version 7.1), developed by Fleming (2008). It was used to determine the preferred learning style of students. It consists of 16 statements that provide a profile of an individual's preferences for how information is received and processed. Each statement has four choices that describe a situation and allows the responder to choose one or more response that they would take. Each action corresponds to one of the four

VAR K learning dimensions, which are visual, aural, reading/writing, and kinesthetic. Respondents may select multiple options for each statement, so it is possible to score high in a single area or in multiple areas, which is noted as being multimodal. Once completed, scores are automatically tallied, or the VARK can be scored using the provided rubric (Fleming, 2008). For each of the 16 responses on the VARK, the student could select any answer from 1 to 4 responses. If the student thought that all choices are correct, a total of 64 choices could be recorded. If the student selected one response for each question a total of 16 choices could be recorded. Total VARK score was computed by adding all responses of students on the 16 questions of the test. Student's questionnaires were scored to represent their learning preferences. Preferences were ranked by calculating the total number of each response leading to unimodal learning style (V (visual), A (Aural), R (read/write), and K (kinesthetic)); or bimodal or multimodal that is composed of three or four learning styles. Each category was equally weighed and the most frequent preference was defined as the dominant preference. Frequencies and percentages were used to define the most frequent preference as the dominant learning preference.

3.4.2 Part II:

Teaching Strategies instrument, developed by Meehan-Andrews (2009), was used to obtain student's feedback on their experiences of lectures, tutorials, practical, and integration classes to determine if these teaching strategies were achieved. It consists of 16 statements, concerning four teaching mode, namely: Lectures (2-items); tutorials (4-items); practical (6-items); and integration (4-items). Responses were measured on a 5-point Likert rating scale ranging from (1) true none of the time to (5) true all of the time. The total score ranged from 16 to 80. The higher the scores, the higher preference of teaching mode.

3.4.3 Part III:

This part included questions related to demographic characteristics of the study subjects such as age, gender, and year of study.

3.5 Methods

The study was performed as follows:

Official Permission to conduct this study was obtained from the dean of the faculty of Nursing, Damanhour University. The permission to use the version 7.1 of VARK was obtained from Fleming (2008) through mail on 2012. The tools used in this study were tested for reliability using Cronbach Alpha Coefficient test, the scores of the VARK was 0.85; and the score for the teaching mode preferences tool was (0.87). A pilot study was conducted on 39 nursing students (10 %) of the total sample size (N = 392), who were selected randomly from the previously

mentioned setting, and who were not included in the study sample, in order to test the relevance and applicability of the study tool (third year = 19 students; and fourth year = 20 students); leading to total sample size (N=353). Students were enrolled in the third and fourth year; they undertook "introduction to nursing administration" and "nursing administration", respectively; as a core subject within their Bachelor of Nursing Sciences program. In teaching "introduction to nursing administration" for third year nursing students, lecture is the only teaching method used; however, in teaching "nursing administration" for fourth year nursing students a variety of teaching methods are employed: lectures, tutorial, and practical. Lectures lasting four hours/week are delivered to a large cohort of students for fourth year and lasting two hours/week for third year nursing students. Small group learning (tutorial) consists of 1 or more students, who are assigned to one teaching assistant according to their clinical training settings in health care organizations, and who got instructions from them in a lecture hall inside the Faculty of Nursing, once/week. Practical classes, lasting for six hours/day/3 days, consist of 40–60 students that are conducted based on the distribution in clinical training settings and nursing units in health care organizations. Tutorials and practical classes are designed and timetabled to follow-up on lecture content, to aid the fourth year nursing students' understanding.

3.6 Ethical Considerations

Approval for the research was obtained from the Dean of the Faculty of Nursing, and Head of Nursing Administration Department. The purpose of the study was explained to nursing students, and got consent for those who are willing to participate in the study, and their right to withdraw from the study was also assured. Anonymity of the participants and confidentiality of their information were assured throughout the research process.

Data was collected through self-administered questionnaires that were handed out to students during a timetabled lecture. Students took 30 minute to complete the questionnaire. The data was collected for a period of 45 days started from 15th of November 2012 to the end of the same month and from the 15th of March 2013 to the 14th of April 2013.

3.7 Statistical analysis

The response rate was 100 %. After data were collected it was revised, coded and fed using the Statistical Package for Social Sciences (SPSS ver.20 Chicago, IL, USA). The given graphs were constructed using Microsoft Excel software. All statistical analysis was done using two tailed tests alpha error of 0.05. *P* value equals to or less than 0.05 was considered to be significant. To answer the

research question, descriptive and inferential statistics were generated for studied variables. Descriptive statistics were done using numbers, percentage, mean with standard deviation that were used to answer learning preferences of nursing students. Analytical statistics were done using Pearson Chi-square and Mont Carlo exact probability test.

4. Results

Table (1) illustrates that the majority of students were in their early twenties (39.7 %); while the minority had 22 years old (9.3 %). The age mean \pm SD was 20.04 \pm 0.94. Above half of the students were enrolled in fourth academic year (51.6 %); as well as, above three quarters of students were female (79 %); compared to 21 % male students.

Table 1: Demographic characteristics of nursing administration students in Damanhour Faculty of Nursing (N=353).

Demographic characteristics		No.	%
Age	19-<20	116	32.9
	20-<21	140	39.7
	21-<22	64	18.1
	22	33	9.3
Mean \pm SD		20.04 \pm 0.94	
Study Year	Third	171	48.4
	Fourth	182	51.6
Gender	Male	74	21.0
	Female	279	79.0

Student preferences for how they receive information can be singular, two modes, three modes or all four modes of presentation. Figure (1) represents the results obtained for this study, revealing that the majority of students, 54.1%, prefer a single mode of information presentation. Two modes of presentation were preferred by 38.5% of students, 7.4% preferred to receive information using three modes and/or all four sensory modes.

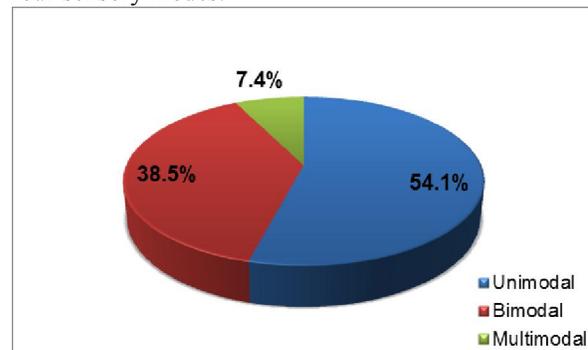


Figure 1: Learning Styles of Nursing Administration Students in Damanhour Faculty of Nursing (N=353).

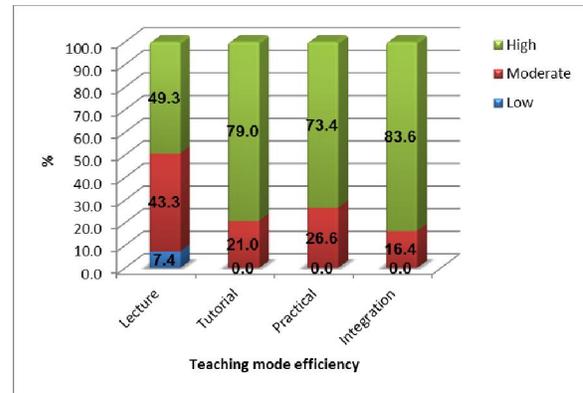
Of the students that preferred a single mode of information presentation, table (2) indicates that 15.2% and 15.4% preferred the kinesthetic or practical classes' mode at the third and fourth year, respectively. The second learning style was visual for the third and fourth year students (13.9%). Whereas, read/write and aural approaches got approximately the same percentage (12.7%, and 12.2%), respectively. Above

one-third of the third and fourth year preferred two types of information presentation or bimodal learners (37.4%, 39.6%), respectively. For those students that preferred three or the four modes of information presentation, the third and fourth year got approximately the same percent (7.6%, 7.1%), respectively.

Table 2. Comparison of learning mode preferences between third and fourth year nursing administration students in Damanhour Faculty of Nursing.

Studying Year	V	A	R	K	Uni (V&A&R&K)	Bi	Tri	Quadri	Multi (Tri+Quadri)
Third Year (N=171)	14.6 (25)	12.3 (21)	12.9 (22)	15.2 (26)	55.0 (94)	37.4 (64)	5.8 (10)	1.8 (3)	7.6 (13)
Fourth Year (N=182)	13.2 (24)	12.1 (22)	12.6 (23)	15.4 (28)	53.3 (97)	39.6 (72)	6.0 (11)	1.1 (2)	7.1 (13)
Total (N=353)	13.9 (49)	12.2 (43)	12.7 (45)	15.3 (54)	54.1 (191)	38.5 (136)	5.9 (21)	1.5 (5)	7.4 (26)

A significant difference was found between the teaching modes efficiency ($\chi^2 = 58.3, p < 0.001$). The majority of students found the integration of teaching approaches to determine how well the current strategies link concepts, in lectures, tutorials and practical sessions, to be useful. As indicated in Figure (2), the integration was perceived as being of most benefit and a useful learning experience (83.6%). Tutorials were the next most useful teaching method, with 79.0% of students responding favorably; followed by practical method (73.4%). The least efficient teaching mode as perceived by the students was lectures classes (49.3%).



low (0 - <33), moderate (33 - <66), and high (>66)
 Figure 2: Teaching Mode Efficiency of Nursing Administration Students in Damanhour Faculty of Nursing (N=353).

According to table (3) there was a significant difference between studying year and learning styles preference where ($P = 0.032$). On the other hand, no significant difference was found between gender and learning styles.

Table 3: Relationship between demographic characteristics and learning styles of nursing administration students in Damanhour Faculty of Nursing.

Characteristics	Learning style						MCP
	Unimodal (n=191)		Bimodal (n=136)		Multimodal (n=26)		
	No	%	No	%	No	%	
Year							
▪ Third Year	94	55.0	60	35.1	17	9.9	0.032 *
▪ Fourth Year	97	53.3	76	41.8	9	4.9	
Gender							
▪ Male	42	56.8	28	37.8	4	5.4	0.733
▪ Female	149	53.4	108	38.7	22	7.9	

MCP: p value based on Mont Carlo exact probability

(*) Statistically significant at $p < 0.05$

Table (4) states that there is a significant difference between teaching mode and year of study ($P=0.000$); whereas no significant difference was found between teaching mode and gender. All third year nursing students choose lecture as their teaching mode; compared to 19.2% of the fourth year. About one-third of fourth year students choose integration between the three methods of teaching as the highest

mode for them (31.4%). Concerning gender and teaching mode, the majority of male and female choose lecture as their efficient teaching mode (28.4%, 34.8%), respectively. Nearly one quarter of both male and female viewed the integration between the three teaching mode as the most efficient (25.7%, 25.4%), consecutively.

Table 4: Relationship between demographic characteristics and teaching modes of nursing administration students in Damanhour Faculty of Nursing.

Characteristics	Teaching Modes (n=353)								χ^2
	Lecture		Practical		Tutorial		Integration		
	No	%	No	%	No	%	No	%	
Year									
Third Year (n=171)	171	100.0	0	0.0	0	0.0	0	0.0	0.000*
Fourth Year (n=182)	35	19.2	43	23.6	47	25.8	57	31.4	
Gender									0.332
Male (n=74)	21	28.4	16	21.6	18	24.3	19	25.7	
Female (n=279)	97	34.8	55	19.7	56	20.1	71	25.4	

χ^2 : *p* value based on Pearson Chi-Square; (*) Statistically significant at $p < 0.05$

As for the relationship between learning styles preferences and teaching mode efficiency. Table (5) elaborates the absence of relationship between them. Concerning integration approach, it got the highest percent for uni, bi and multimodal learning styles (84.3%, 81.6%, 88.5%), respectively. Then, tutorial mode which got the highest percent in bimodal

learning style, followed by unimodal and finally, multimodal (80.1%, 78.5%, 76.9%), consecutively. Lecture got the lowest percentage among different learning styles, 61.5% for multimodal, 50.7% for bimodal, and lastly, 46.6% for unimodal learning style.

Table 5: Relationship between teaching mode efficiency and learning styles of nursing administration students in Damanhour Faculty of Nursing.

Teaching mode	Learning styles						MCP
	Unimodal (n=191)		Bimodal (n=136)		Multimodal (n=26)		
	No	%	No	%	No	%	
Lecture							0.649
▪ Low	15	7.9	9	6.6	2	7.7	
▪ Moderate	87	45.5	58	42.6	8	30.8	
▪ High	89	46.6	69	50.7	16	61.5	
Tutorial							0.905
▪ Moderate	41	21.5	27	19.9	6	23.1	
▪ High	150	78.5	109	80.1	20	76.9	
Practical							0.462
▪ Moderate	56	29.3	32	23.5	6	23.1	
▪ High	135	70.7	104	76.5	20	76.9	
Integration							0.637
▪ Moderate	30	15.7	25	18.4	3	11.5	
▪ High	161	84.3	111	81.6	23	88.5	

MCP: *p* value based on Mont Carlo exact probability; (*) Statistically significant at $p < 0.05$; low (0 -<33), moderate (33 -<66), and high (>66)

5. Discussion

The study of learning styles has received significant attention in recent years, it is vital that educators know and utilize the best possible methods for helping students learn successfully, through the usage of a variety of teaching techniques to effectively reach all students, who must also become self-controlled in their learning process (Wilson, 2011). Students must know how to adjust to fit the information they are learning (Salehi & Shahnooshi, 2007). According to Zapalska and Dabb (2002), an understanding of the way students learn improves the selection of teaching strategies best suited to student learning. For students, this matching of instructional strategies to their individual learning styles has "consistently evidenced positive results" in empirical studies (Minotti, 2005). Fortunately, the educational

world is opening up to the importance of understanding the various ways students learn and recognizing the vital role this plays in attaining widespread academic success (Collinson, 2000). Consequently, the purpose of the study was to examine the learning styles of nursing administration students and their teaching mode efficiency at Faculty of Nursing, University of Damanhour.

Findings from the current study showed that, the majority of students had a unique learning mode preference and more than one third preferred two modes of presentation. This may be related to the learners, who prefer mode of learning that is related to the sensory modality or the neural system by which they prefer to take in the new information; although learners can use all sensory modes of learning. This result is consistent with the findings of prior research

(Fine, 2003; Felder & Brent, 2005; Meehan-Andrews, 2009; Alaka, 2011), who found that majority of students prefer a single mode of information presentation; followed by two modes of presentation, the minority preferred three modes or even preferred to receive information using all four sensory modes. Moreover, a study conducted by Mohamed & Helal (2012) revealed that the majority of nursing students in both faculty of nursing and technical institute of nursing are unimodal based on the VARK model of learning style. On the other hand, Baykan and Naçar (2007) and Alkhasawneh (2013), who used VARK to assess the learning preferences of medical and dental students, concluded that approximately 64% of the medical students and 56% of dental students in Michigan and in Turkey, respectively; had multimodal learning preferences.

Teaching nursing is a complex activity that integrates art and science of nursing process and clinical practice into the teaching learning process. The result of this study revealed that, kinesthetic learning style was the most favorable learning style for the nursing students in both third and fourth year, followed by visual, read/write and aural or lecturing presentation. Despite that third year nursing students get their theoretical information through lecturing, kinesthetic was thought to be the most efficient method. This may be related to the fact that the nursing students are more prone to the practical areas where they learn actively how to perform nursing tasks which is beneficial for them when working; as well as some of the third year nursing students indicated that nursing administration is a hard subject to understand without practical and/or tutorial classes. This is in line with the result of several studies that indicated that nursing students prefer kinesthetic modes of information presentation (Meehan-Andrews, 2009; James *et al.*, 2011). Moreover, Wehrwein *et al.* (2006) conducted a longitudinal study tracking student's sensory based learning preferences over time, and provide an indication of possible shifts in learning preferences over their courses; as well as they found that first year postgraduate medical students preferred the kinesthetic style. Moreover, Meehan-Andrews (2009) concluded that the 'art' of lecturing and the performance that is now expected of lecturers is appreciated by the students who prefer visual modes of information presentation; along with diagrams, symbols and image rich power point presentations, the artful lecturer will excite the learning modes of visual students.

This is partially incongruent with the results reported by Fleming (2010), on the VARK website, who highlighted the different learning capabilities of students straight from high school and university, with the emphasis that first year students may prefer

kinesthetic modes of information presentation, such as practical sessions, or case studies during tutorial sessions; however, second, third and fourth year students may develop or mature in their learning to prefer visual, aural or read/write modes as they tackle more challenging manual skills projects in clinical placements. It is concluded that students can develop the ability to adopt different preferred modes of information presentation depending on their current situation or activity, such as kinesthetic mode during a practical class or aural mode in lectures, which may also need to be developed in students as they move from high school to gratify the increased workload and emphasis on self-learning. This is supported by Breckler & Joun (2009); and Frankel (2009), who draw similar conclusions that teaching should not be confined to the classroom and should include practical as well as theoretical aspects.

The majority of students participating in the current study indicated that the integration between different teaching approaches, to link concepts, in tutorials, practical and lectures sessions, to be useful. Tutorials were the second most useful teaching method; followed by practical approach. The least efficient teaching mode perceived by the students was lecture classes. This may be due to the students, who found themselves in large numbers and small size classes, and who need to sit down side together to be able to learn efficiently; as well as it is the easiest and safest way for the teaching staff. Additionally, it may be also related to the point of view of the students that by integrating the three approaches learning will be reached efficiently, as through practical and tutorial the application of theoretical content is achieved. This result is consistent with Meehan-Andrews (2009), who mentioned that the majority of students (91.9%) responded that practical sessions helped them understand lecture material; and that linking concepts introduced during lectures and then further explored during practical sessions, would be very favorable for students, who argued that practical sessions would visualize the difficult concepts relating to courses and that the two modes are considered the most useful learning experience as it encourage active learning and critical thinking. Furthermore, in this previous study, it was found that a very small percentage of students preferred aural mode of information presentation; an example of this mode is the classic lecture, which is essentially a passive learning method that stimulates rote memorization; thus the integration reiterates the information but also presents it in various means to fit the different student learning preferences (Meehan-Andrews, 2009).

Similarly, James *et al.* (2011) highlighted that lectures and tutorials were useful for their learning; and they reported that rural nursing students had

significantly higher visual and kinesthetic scores, and higher visual and read-write scores compared to metropolitan students. On the other hand, Davies *et al.* (2000) found in his study that practical sessions have less impact on student learning, because of the current economic climate, practical sessions are increasingly becoming more of a financial burden. Moreover, the findings of Mohamed and Helal (2012), and DiCarlo (2008) revealed that lecture is one of the most common teaching strategies as it was reported by the majority of students either at faculty of nursing or at technical institute of nursing. Moreover, contrarily, tutorials were seen as least useful by most students; however, it was found by faculty as beneficial for a number of variables: student participation, group dynamics and interactions between students and the tutor (Davies *et al.*, 2000). This is supported by Meehan-Andrews (2009), who stated that tutorials are a very effective way of providing students with feedback or question time sessions; and that they can be structured, group work or problem based, or relaxed where students can ask any question on any topic.

Regarding year of study, significant differences were found between studying year and both learning styles preference and teaching modes. Both third and fourth year students choose integration as an efficient teaching mode; followed by practical. This may be related to the students, who gained more experience from their earlier years in the faculty, so they encountered the different teaching methods and clarified their most preferred learning styles. Consequently, students are able to adjust the information received, in order to cope with which learning style and teaching mode, they prefer to succeed in the learning process. This result is congruent with that of Mohamed and Helal (2012), and Rusian (2005), who indicated a statistically significant difference between learning styles and years of study. It is partially congruent with the results of Wehrwein *et al.* (2006), who stated that students preferred kinesthetic as learning style; as well as practical followed by integration as a teaching mode. This is supported by Palloff & Pratt (2003) who mentioned that learning style preferences changed with age, experience, and maturity; therefore, it made sense that the activities designed to engage various learning styles in a traditional undergraduate course would be different from those designed for graduate courses.

Concerning gender, the findings of the present study revealed that there were no significant relationship between gender and both learning styles preference and teaching modes. This result is congruent with several studies, which reported no statistically significant relationship between learning

styles and gender (Linares, 1999; Salehi & Shahnooshi, 2007; Chang *et al.*, 2011; Mohamed & Helal, 2012). Lie *et al.* (2004) emphasized that males are likely to attribute their success in the classroom to external causes, such as teaching and their learning preference are more toward rational evaluation and logic; whereas females generally see their success as being directly related to their efforts in the classroom through the use of "elaborative" processing in which they tend to seek personal relevance or individual connections with the material being taught. Additionally, Reese and Dunn (2007) reported that males had a stronger need for learning with an authority figure, and were more visual learners and required structure and mobility; however, female students preferred learning alone or with peers, and a variety of instructional approaches.

Finally, the result showed absence of relationship between learning style and teaching mode. This may be due to students, who are not in control of the teaching mode delivered, whatever the teaching strategies they are forced to learn, but they can adjust their learning style. The finding also revealed that despite the learning style preference, either uni or bi or multi modal; the integration approach got the highest percentage; followed by tutorial mode. As for lecture, it got the lowest percentage among the three learning styles. Contrarily to these findings is the studies conducted by Boström and Hallin (2013); and Tulbure (2012), who found a significant difference between teaching and learning styles, and recommended that in order to create effective programs and to reduce the number of dropouts, there should be matching groups with instructional methods, and that different courses should have different designs, training plans, flexible leadership skills among teachers, choice of teaching materials, and various tutoring methods for matching each student group.

In conclusion, there is no single right way to present material, but by providing a variety of different approaches, the differing learning styles of students can be accommodated. Student learning preferences may change as they progress in nursing school, so assessing a class at the beginning of each semester can provide faculty with a snapshot of where the class is as a whole and enable faculty to provide learning materials in different learning styles in an attempt to meet the needs of the student (Hawk & Shah, 2007). Having an understanding of where a class is, can enable faculty to better support student learning needs (DiBartola, 2006). Faculty should assess their students' learning styles and provide them with learning style preference-specific information, which would take place before students start their nursing classes. This notion is supported by the findings of Woeste and Barham (2007), who stated

that identifying student learning styles early can help faculty create a learner-centered approach, while strengthening the quality of learning. Lastly, through goal-talks mentors, which create fuel for insistence, desire, commitment, and tools for lifelong learning; it could be possible if the relationship between students and teachers are long-term and if the dialogues consist of reflections and affirmations that enforce self-esteem and elevate career opportunities (Tulbure, 2012).

6. Conclusion

Learning styles are a major consideration in the education process. The increase demand for nurses is achieved through retaining the students in nursing programs. Learning can be effective if teaching strategies will enhance a student's ability to learn, not hinder it. When teaching health professionals, one of the faced challenges is that teaching staff adapt the methods that best suit them without recognizing the learners' styles and preferences. The results of this study revealed that there are relationships between academic studying year and both learning styles and teaching mode. On the other hand, there are no relationships between learning styles preferences and teaching mode efficiency; as well as, between gender and both learning styles and teaching mode. The finding also indicated that the majority of nursing students prefer the unimodal learning style, mainly kinesthetic method of information presentation. Therefore, knowledge of an individual's learning style can be helpful in assisting the individual to be successful in educational undertakings. This can become an opportunity to affect positive change through the development of new educational strategies, increased nursing graduates, and a greater opportunity for nurse educators to meet the demands of an ever changing healthcare environment.

7. Recommendations and limitation of the study

It is important for nurse educators to identify learning styles early upon admission into nursing programs through the administration of learning style inventories; and incorporate understanding of learning styles into retention strategies. By employing a variety of teaching styles, maximum effectiveness will be reached. The nurse educator should also investigate if there is an association in learning style and those students who are unsuccessful in the nursing program. Based on the findings of this study, academic institutions should revise their obligations to their nursing students and evaluate their accountability for determining and utilizing a variety of teaching styles to meet the complex needs of the students. Additional studies are needed to replicate the study to examine a variety of health care disciplines; to compare results of the Learning Styles Inventory "VARK" with other

variables, as: personality types, academic achievement, etc. The biggest barrier to this study was the limited diversity in the sample. Caution should be exercised in generalizing the findings to all students.

Acknowledgments:

For cooperation and participation in this study, the authors are indebted to all nursing administration students, enrolled at the third and fourth year at the Faculty of Nursing - University of Damanhour, who agreed to participate in this study.

8. References

- Alaka, A.M. (2011). Learning styles: What difference do the differences make?. *Charleston Law Review*, 5(2), 133-172.
- AlKhasawneh, E. (2013). Using VARK to assess changes in learning preferences of nursing students at a public university in Jordan: Implications for teaching. *Nurse Education Today*, 33, 1546-1549.
- Baykan, Z., & Naçar, M. (2007). Learning styles of first-year medical students attending Erciyes University in Kayseri, Turkey. *Adv Physiol Educ*, 31, 158-160.
- Bishka, A. (2010). Learning styles fray: Brilliant or batty?. *Performance Improvement*, 49(10), 9-13. <http://dx.doi.org/10.1002/pfi.20181>.
- Boström, L., & Hallin, K. (2013). Learning Style Differences between Nursing and Teaching Students in Sweden: A Comparative Study. *International Journal of Higher Education*, 2(1), 9-11. <http://www.sciedu.ca/ijhe>.
- Breckler, J., & Joun, D. (2009). Learning styles of physiology students interested in the health professions. *Adv Physiol Educ*, 33, 30-36.
- Brown, E.J., & Pluske, J. (2007). An application of learning and teaching styles: A case study of science and engineering seminars. *Teaching and Learning Forum 2007*. Available at: <https://lsn.curtin.edu.au/tlf/tlf2007/refereed/brown.html>, accessed 16 June 2012.
- Burruss, N. (2010). Variables associated with intent to use learning style preference information by undergraduate nursing students. Available at: <https://scholarworks.iupui.edu/handle/1805/2489>, accessed 25 August 2011.
- Chang, H., Wen, L., & Chen, C. (2011). The Learning Style of MBA Students. 2nd International Conference on Education and Management Technology IPEDR vol.13, IACSIT Press, Singapore.
- Collinson, E. (2000). A survey of elementary students' learning style preferences and academic success. *Contemporary Education*, 71(4), 42-48.
- Davies, S., Murphy, F., & Jordan, S. (2000). Bioscience in the preregistration curriculum: finding the right teaching strategy. *Nurse Education Today*, 20, 123-135.
- DiBartola, L.M. (2006). The learning style inventory challenge: Teaching about teaching by learning about learning. *Journal of Allied Health*, 35(4), 238-245.
- DiCarlo, S.E. (2008). Teaching alveolar ventilation with simple, inexpensive models. *Adv Physiol Educ.*, 32, 185-191.
- Emerson, R., & Records, K. (2008). Today's challenge, tomorrow's excellence: The practice of evidence-based education. *Journal of Nursing Education*, 47(8), 359-370.
- Evans, B. (2008). The importance of educational and social backgrounds of diverse students to nursing program success. *Journal of Nursing Education*, 47(7), 305-313.
- Felder, R., & Brent, R. (2005). Understanding students' differences. *Journal of Engineering Education*, 94 (1), 57-72.
- Fine, D. (2003). A sense of learning style. *Principal Leadership: High School Edition*, 4(2), 55-59.

- Fleming, N. (2008). VARK: A guide to learning styles. (Version 7.1). Available at: <http://www.vark-learn.com/english/index.asp>, accessed 4 March 2012.
- Fleming, N. (2010). VARK Classification of Learning Styles. Available at: <http://www.vark-learn.com>, accessed 20 January 2011.
- Fountain, R., & Alfred, D. (2009). Student satisfaction with high-fidelity simulation: Does it correlate with learning styles? *Nursing Education Perspectives*, 30(2), 96–98.
- Frankel, A. (2009). Nurses, Learning Style : Promoting Better Integration of Theory into Practice. *Nursing Times*, 105(2), 24-27.
- Fritz, M. (2002). 'Using learning styles inventories to promote active learning'. *Journal of College Reading and Learning*, 32(2), 183-9.
- Hawk, T.F., & Shah, A. J. (2007). Using learning style instruments to enhance student learning. *Journal of Innovative Education*, 5(1), 1–16.
- Holstein, B., Zangrilli, B., & Taboas, P. (2006). Standardized testing tools to support quality educational outcomes. *Quality Managed Health Care*, 15(4), 300–308.
- Ironside, P., & Valiga, T. (2006). National survey on excellence in nursing education. *Nursing Education Perspectives*, 27(3), 166–169.
- James, S., D'Amore, A., & Thomas, T. (2011). Learning preferences of first year nursing and midwifery students: Utilizing VARK. *Nurse Education Today*, 31(4), 417–423. <http://dx.doi.org/10.1016/j.nedt.2010.08.008>.
- Lie, L.Y., Angelique, L., & Cheong, E. (2004) How do male and female students approach learning at NUS? *CDTL Brief*, 7, 1–3.
- Linares, A.A. (1999). Comparative study of learning characteristics of RN and Genetic students. *Journal of Nursing Education*, 28 (4), 354-360.
- Loyola, S. (2010). Evidence-based teaching guidelines: Transforming knowledge into practice for better outcomes in healthcare. *Critical Care Nursing Quarterly*, 33(1), 19–32.
- Martin, S. (2010). Teachers using learning styles: Torn between research and accountability?. *Teaching and Teacher Education*, 26(8), 1583-1591. <http://dx.doi.org/10.1016/j.tate.2010.06.009>.
- Meehan-Andrews, T.A. (2009). Teaching mode efficiency and learning preferences of first year nursing students. *Nurse Education Today*, 29, 24–32, <http://dx.doi.org/10.1016/j.nedt.2008.06.07>.
- Minotti, J.L. (2005). Effects of learning-style-based homework prescriptions on the achievement and attitudes of middle school students. *NASSP Bulletin*, 89(642), 67-89. doi: 10.1177/019263650508964206.
- Mohamed, A., & Helal, H. (2012). Learning Styles of Community Health Nursing Students' at Faculty of Nursing and Technical Institute of Nursing - In Alexandria. *New York Science Journal*, 5(4), 28-37.
- Murphy, R., Gray, S., Straja, S., & Bogert, M. (2004). Student learning preferences and teaching implications. *Journal of Dental Education*, 68, 859–866.
- National League of Nursing. (2005). Core competencies of nurse educators with task statements. Available at: <http://www.nln.org/facultydevelopment/pdf/corecompetencies.pdf>, accessed 23 April 2012.
- National League for Nursing. (2009). Nursing education research 2010 grants program. Available at: <http://www.nln.org/research/2010grant/index.htm>, accessed 23 April 2012.
- Palloff, R., & Pratt, K. (2003). *The virtual student: A profile and guide to working with online learners*. San Francisco, CA: Jossey-Bass.
- Reese, V., & Dunn, R. (2007). Learning style preferences of a diverse freshman population in a large, private, metropolitan university by gender and GPA. *Journal of College Student Retention*, 9(1), 95–112.
- Rusian, C. (2005). Preferred learning styles for respiratory care students at Texas state university–San Marcos. *The Journal of Allied Health Sciences and Practice*, 3 (4), 485–488.
- Salehi, Sh., & Shahnooshi, Eh. (2007). Nursing Students' Preferred Learning Styles. *Journal of Medical Education*, 11(3 & 4), 25-31.
- Scott, C. (2010). The enduring appeal of 'learning styles'. *Australian Journal of Education*, 54(1), 5-17. Available at: <http://aed.sagepub.com/content/54/1/5.full.pdf+html>, accessed 18 June 2012.
- Shannon, S.V. (2008). Using metacognitive strategies and learning styles to create self-directed learners. *Institute for Learning Styles Journal*, 1, 14–26.
- Terry, M. (2001). 'Translating learning style theory into university teaching practices: an article based on Kolb's experiential learning model'. *Journal of College Reading and Learning*, 32(1), 68-86.
- Tulbure, C. (2012). Investigating the relationships between teaching strategies and learning styles in higher education. *Acta Didactica Napocensia*, 5(1), 65-74.
- Verster, C. (2010). Learning styles and teaching. Available at: <http://www.teachingenglish.org.uk/article/learning-styles-teaching>, accessed 10 January 2013.
- Vorhaus, J. (2010). Learning styles in vocational education and training. In: Penelope, P., Eva, B., & Barry, M. (Eds.). *International Encyclopedia of Education*. Oxford: Elsevier, pp. 376–382.
- Wehrwein, E., Lujan, H., & DiCarlo, S. (2006). Gender differences in learning style preferences among undergraduate physiology students. *Adv Physiol Educ* 31: 153–157, 2007; doi:10.1152/advan.00060.2006.
- Williamson, M., & Watson, R. (2007). Learning styles research: Understanding how teaching should be impacted by the way learners learn: Part III: Understanding how learners' personality styles impact learning. *Christian Education Journal*, 4(1), 62-77. Available at: <http://journals.biola.edu/cej/volumes/4/issues/1/articles/62>, accessed 12 January 2012.
- Wilson, M. (2011). Students' learning style preferences and teachers' instructional strategies: Correlations between matched styles and academic achievement. Available at: <http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1504&context=doctoral>, accessed 25 September 2012.
- Woeste, L.A., & Barham, B.J. (2007). Undergraduate student researchers preferred learning styles, and basic science research: A winning combination. *The Clearing House*, 81(2), 63–66.
- Zapalska, A., & Dabb, H. (2002). Learning styles. *Journal of Teaching in International Business*, 13(3/4), 77-97.