Exploring Learning Styles in Students Attended Problem-Based Learning Package at Hue University of Medicine and Pharmacy

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ABSTRACT

Purpose: Learning style differs among students; 4 were identified by David A. Kolb (1984). Learning style identification plays a vital role in enhancing learning performance in response to choice of approaches to engaging students, particularly for Problem-based learning (PBL) methods used in Hue University of Medicine and Pharmacy. This research aimed to identify the learning styles of those students responding to PBL packages and investigate relationships between their learning styles and academic performance.

Methods: The cross-sectional study was conducted nursing students (N=135) who engaged with PBL packages in the subject Fundamental Nursing 3 in the second semester of the academic year 2016-2017. A questionnaire consisted of items on general characteristics, a learning style scale (Kolb LSI 3.1), and details around academic performance. Data were analyzed by using SPSS 22.0 program.

Results: The findings indicated that the diverging is the descriptor of the preferred learning style of 43.7% nursing students; 24.4% represented the converging style; the accommodating style accounted for 18.5% and assimilating style was 13.3%. Our study had not yet found the effect of learning methods on the academic performance of nursing students (toward Formative result: F=0.872, p=0.235; toward Summative result: F=1.116, p=0.345).

Conclusion: A majority of nursing students chose the diverging learning style over others but there was no significant difference between academic performance and learning styles. Therefore, teachers should be flexible and use different stimuli for learning in order to attempt to engage learners in stimuli for learning about different situations, irrespective of their preferred style for learning. It is important to provide optimal learning environments for most students.

Keywords: Learning Style, Problem-based learning, Nursing

INTRODUCTION

Background

Vietnam is undergoing transformations that involve internationalization and renewal and innovation in higher education. The focus is on improving the quality of teaching and learning activities (Communist Party 2013). However, it seems clear that there is still minimal interaction between teachers and students inside and outside the classrooms; greater emphasis is still placed on memorizing knowledge without relying on high-level conceptual and scholarly processes of learning involving analysis and synthesis. As a consequence, students remain passive as reported by Ngo in 2010. Hence a focus on ways to innovate in higher education remains essential if Vietnam is to align their approach to education with that of other countries in the region and across the world. Innovation is needed around acquisition of content and student centered processes that focus on situations and strategies that reflect actual Vietnamese population needs.

In Vietnam curriculum renewal has begun with greater use of more creativity and more active, student-centered-learning approaches with knowledge applied to actual practice-based situations that demand problem-solving ability. Specifically, Medical graduates must be able to work with issues around population health in their own country. In recent years the Hue University of Medicine and Pharmacy (Hue UMP) has adopted e-learning, U-learning, Problem-based, team-based, simulations and case-based curriculum materials to its more traditional approach to learning. These efforts around change have had many positive results in learning events and outcomes Nguyen, Mai, Cao 2017).

Academic success for the student may encompass goal-setting, effective teaching methods, time management, study skills and properly presented assignments as well as acknowledging preferences for a particular style of learning (Vanwynen, 1997). Learning style has been defined as an individual's natural, habitual and preferred ways of absorbing, processing, and retaining new information and skills (Chen, 2010). David Kolb, the founder of the experiential learning theory, classifies the learner into one of four learning styles: Converging, Diverging, Assimilating, and Accommodating. Understanding and identifying how students learn and their ability to direct themselves in learning not only increases students' confidence in their own ability, but also improves their capacity to learn in novel situations, especially when applying PBL methods, an instructional approach in which student learn through facilitated problem solving (Cindy, 2004). In addition, academic results directly reflect the effect of learning style on each student, it necessary for teachers to understand and improve the quality of their approach to teaching and learning. This research was conducted with the following objectives: i. Describe the general characteristics of the students; ii. Identify the student's learning styles when attended the PBL packages; iii. Investigate the relationship between learning styles and academic performance of the student.

METHODS

Study design

The study used a cross – sectional design involving second-year nursing students who agreed to participate. They were enrolled in "Fundamental Nursing 3", a subject using PBL packages in the second-semester of academic year 2016-2017.

Ethical considerations

The research was conducted in the spirit of respecting the privacy and with informed consent of all subjects for participation. All information has only been used for research purposes.

The information of the study participants was processed and published in the form of data, not using personal names. The research proposal had approval from the Ethics Clearance Committee of Hue University of Medicine and Pharmacy.

Instruments

A questionnaire began with general student characteristics before requesting completion of Kolb's Learning Style Inventory - LSI 3.1 (2005) which has demonstrated validity in its design intended to help individuals identify the way they learn from experience. For each of the twelve questions (on how you deal with ideas and day-to-day situations) on the LSI, students choose from four response options on a scale ranging from 4 (most descriptive of you) to 1 (least descriptive of you).

Kolb's LSI 3.1 is designed to ascertain a person's preference for an approach to learning that can be seen as 1 of 4 learning styles: CE - Concrete experience; RO: Reflective observation; AC - Abstract Conceptualization: AE - Active Experimentation. Based on results, one can identify individual learning style as either Diverging, Converging, Assimilating or Accommodating.

Findings from this data set were then compared with students' academic performance.

Setting and samples

The cohort of 135 students were divided into 3 classrooms. Students had separate tables to ensure privacy during the period allocated for completion of the survey. Investigators introduced them to and provided clear explanations about the research tools, emphasized privacy and information security and encouraged students to answer honestly based on what they knew and experienced themselves. The investigators then issued and guided the students on how to complete the questionnaire and answer all questions if possible. Students were given sufficient time to complete the questionnaire without any pressure. Investigators did not influence the students' completion of the survey, but then collected questionnaires and encoded each answer sheet to de-identify data.

Data analysis

Comparative data were analyzed by using SPSS 22.0. A t-test and ANOVA was used to analyze the difference about academic performance among learning modes and learning styles as well.

Limitations

First, the data were self-reports that represent students' perceptions. Second, the sample size of this study was small and the distribution of styles might not be representative of all nursing students in Hue University of Medicine and Pharmacy. Further to this only some classes in the Faculty of Nursing involved PBL packages. The choices of learning events and assessment tasks would be different from a traditional approach. There might have been some unintended bias from the investigators who tried to clearly explain the research tools as well as answer the questions from the students.

RESULTS

General characteristics: Female students were in the majority (88.9%) reflecting the demographics of the nursing profession in Vietnam and across the world. The geographic distribution showed that 57.0% of students came from rural and 43.0% from urban areas. In addition 14.8% were students with socio-economic disadvantage (holding poor/nearly poor household certificates) and 31.0% had part-time jobs with 39.5% of these students spending over 4 hours/day at work (Table 1).

Table 1. General characteristics of nursing students

General information		n	%
Gender	Male	15	11.1
	Female	120	88.9
Home place	Rural areas	77	57.0
	Urban areas	58	43.0
Parental Marriage	Married	124	91.9
	Divorced	5	3.7
Living with whom	Parent	63	46.7
	Father/ Mother	8	5.9
	Alone	54	40.0
	Other	10	7.4
Economic condition	Poor/Nearly Poor	20	14.8
	Avarage and over	115	85.2
Part- time job	Yes	43	31.9
	No	92	68.1
Hours of part-time job	< 4 hours/day	26	60.5
	≥ 4 hours/ day	17	39.5
Total			

Students selecting AC and AE as representative of their preference for a style of learning were not significantly different Table 2 while those representing CE and RO, RO and AC, AE and CE on the LSI (Table 3). This means that nursing students differed in their preferences for approaches to learning.

Table 2. KLSI 3.1 Means of learning modes among nursing students

Acronym	Learning Modes	Mean	SD	95% CI
CE	Concrete Experience	27.6	5.7	26.6 – 28.6
RO	Reflective Observation	29.3	5.4	28.4 – 30.2
AC	Abstract Conceptualization	31.1	6.6	29.9 – 32.2
AE	Active Experimentation	32.0	4.7	31.2 – 32.8

Table 3. T-test matrix about the difference between learning modes

T-test p value	CE	RO	AC	AE
CE	-	0,029	0,000	0,000
RO	0,029	-	0,034	0,000
AC	0,000	0,034	-	0,245
AE	0,000	0,000	0,245	-

The distribution of the preferred learning styles of these students were as follows: Diverging (43.7%) Converging and Accommodating (24.4% and 18.5 %, respectively). The Assimilating style was the choice of 13.3% of the respondents (Figure 1). These findings were similar to those in other studies, but one in Saudi Arabia showed their styles as: Converging (35.6%); Diverging (25.8%); Assimilating (25.5%) and Accommodating (13.1%) (El-Gilany and Abusaad, 2012).
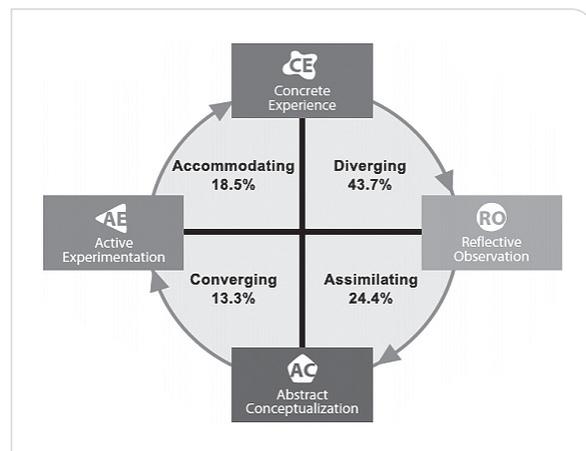

Figure 1. Distribution of the preferred learning styles

Learning styles of students differed between those from urban and rural areas: It is clear that students in

both of urban and rural areas predominantly preferred the Diverging learning style, accounting for 41.6% and 45.6%, respectively (Figure 2).
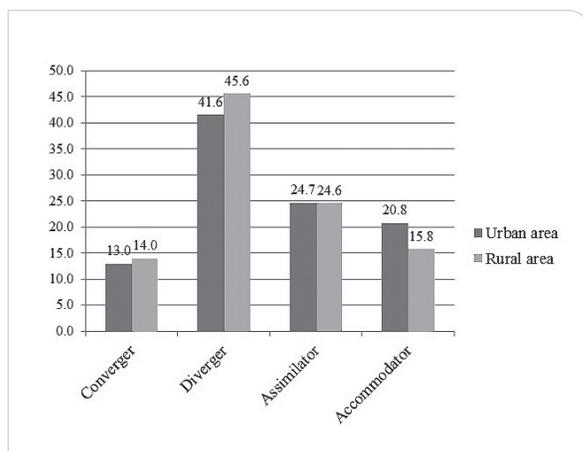

Figure 2. Learning styles of students between urban and rural areas(%)

When examining the relationship between preferences for learning styles and academic performance results indicated that there was no significant difference within formative and summative results between students with any of the 4 learning styles: Diverging, Assimilating, Converging.

Accommodating (See Table 4): Although the majority of nursing students selected a preference for the diverging style (43.7%), comparison with both formative and summative student results showed no significant differences.

Table 4. The difference of academic result in learning styles of nursing students

Academic result		Learning styles			
		Diverging	Converging	Accommodating	Assimilating
Formative result	Average	8.44	8.35	8.50	8.41
	SD	0.65	0.72	0.68	0.57
	F	0.235			
	p	0.872			
Summative result	Average	8.12	7.88	7.93	7.88
	SD	0.64	0.48	0.81	0.83
	F	1.116			
	p	0.345			

DISCUSSION

The most effective outcomes of learning are achieved when students move through the cycle from concrete experience, then observation and experience, processes of conceptualizing and drawing tentative conclusions which can then be tested again in novel situations. According to Kolb (2005), the effective learning process should be a combination of the 4 within a cycle in the following order: CE RO AC AE. However it is possible to enter the cycle at any stage and follow it through its logical sequence but the learner should engage with all four stages of the model. Therefore, no one stage of the cycle is effective as a learning procedure on its own.

The learning stages of nursing students were not balanced. Most students in Hue UMP came from Central Vietnam where many people still suffer from poor economic conditions. Part-time work is therefore essential for their financial support during studies. However, their time at work may impact on their engagement in learning in a manner consistent with the 4 stages of the integrated approach as viewed by Kolb (1974). The majority of students using PBL methods preferred the Diverging style over others. Their sequence of learning involved exploration, acquiring knowledge from observation and then reassessing through revisiting concepts. Diverging style learners solve problems through imagining and reliance on emotion (Nesreen, AbuAssi, Hanan A. Ezzat Alkorashy, 2016). According to Kolb (1984), students with a Diverging learning style are the more sensitive ones who are interested in group work and easily adapt to different points of view as well as assessment and feedback. The style therefore is well suited to active learning methods such as in PBL approaches applied to the nursing profession.

There were no significant difference on formative and summative academic results among the 4 learning styles: diverging learning style, converging learning style, accommodating learning style and assimilating learning style. Even though the proportion of nursing students with the diverging learning style were in the majority, there was no significant difference within the groups representing other learning styles. Therefore, teachers should be flexible in applying different learning methods in an effort to avoid causing boredom for students and provide optimal learning environments for most students in their classrooms.

The success of application of a new teaching method is dependent on many factors: Characteristics of the teachers, learners, instructional design and the assessment/evaluation tasks can all have an impact. If the student assessment method is not appropriate for the teaching/learning approach, it can affect the academic results as well. The PBL application processes in Hue UMP are still in the pilot phase and need to be improved in all steps within implementation to reach the optimal achievements.

CONCLUSIONS

The nursing students in this study predominantly preferred the learning style reflected as a Diverging, but there was no significant difference between academic performance and those showing preference for the 4 styles defined by Kolb. Therefore, teachers should be flexible in applying different learning methods in an effort to avoid student boredom and disengagement in order to provide an optimal learning environment within classrooms. Having descriptions of student learning styles can be useful, especially when attempting to use PBL philosophy

and methods where enquiry/critical thinking skills are seen as having relevance for development of the learners as professionals of the future.

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