

Learning Styles of Nursing and Midwifery Undergraduates of University of Peradeniya, Sri Lanka Utilising the Kolb Learning Style Inventory

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Abstract— *The Learning Style Inventory (LSI) is a simple self-description test, based on experiential learning theory that is designed to help individuals identify the way they learn from experience. On the other hand if students' learning style is known, academics could assist in selecting appropriate instructional methods and educational options. This study was performed to determine the learning style preference and to find out the relationship between learning styles and socioeconomic background of BSc Nursing undergraduates in University of Peradeniya, Sri Lanka. A descriptive, cross-sectional design was used. One hundred and forty four undergraduate nursing students participated in the study. Data was collected using self-administered questionnaires covering the demographic features of students and the Kolb's learning styles inventory. Descriptive statistical procedures were used for analysis. The response rate was 83% (n=144). The majority of nursing students investigated in this study were convergers (40.8%), followed by accommodators (38.3%), divergers (16.7%) and assimilators (4.1%). Learning styles of students showed difference between males and females. Most male students had convergent learning style, while the female dominant learning style was accommodating. Further analysis showed that the final year students had more preferences for active experimentation and concrete experience, while the first year students had preferences for abstract conceptualization and active experimentation. An emphasis needs to be placed on student learning styles and its impact in the educational process. An understanding and incorporation of learning styles in the education of health care providers could have a positive impact not only on the teaching and learning process but also on the effectiveness of interdisciplinary team interactions and the patient educational process.*

Keywords— *Learning style, learning style inventory, nursing*

I. INTRODUCTION

The continuous production and changing nature of scientific knowledge in nursing causes excessive information in the field. When nursing programmes attempt to include up to date information in their curricula, nursing students face an overwhelming burden of information and desperately tend to memorize all the facts instead of in-depth learning. If students' learning style is known, academics could anticipate their students' preferences, take advantage of their strengths and avoid their weaknesses (DeCoux, 1990).

The concept of learning style was raised regarding the hypothesis that each individual learns in a distinctive way. In the literature, the Kolb learning style inventory (LSI) has been the most commonly used tool among medical students and professionals (Buali et al., 2013). Kolb defines adult learning as the process whereby knowledge is created through the transformation of experience. He views learning as a circular process through four stages of experiences. 1) Concrete experience (CE), which consists of learning from feelings or reactions to new experience, 2) Reflective observation (RO), which consists of learning from listening and observing, 3) Abstract Conceptualization (AC), which consists of learning from thinking and analysing problems in a systematic method, and 4) Active Experimentation (AE), which consists of learning by doing. He further argued that there are four personality types of learning styles, namely, converger, diverger, assimilator and accommodator. (Kolb, 1984)

Learning style of a person is influenced by many factors such as age, gender, socioeconomic background. One particular issue within the Learning style preference that has been examined are the factors such as personality, culture, course context and demographic profile (Romanelli et al., 2009). The purpose of this study was to determine the learning styles of nursing students

in the Department of Nursing at University of Peradeniya, Sri Lanka and investigate the relationship of learning styles with gender, academic year and socioeconomic status.

II. METHODOLOGY

A descriptive, cross-sectional design was used. The sample was 144 nursing students who were enrolled into the undergraduate nursing programme in University of Peradeniya in 2012. Such a sample was chosen as they were the whole population of nursing undergraduates in University of Peradeniya. Data collection tool was a questionnaire which consisted of the Kolb Learning Style Inventory and a sociodemographic questionnaire which was prepared by the authors to inquire about the participants' age, sex, academic year, educational background and occupational status of parents. This study received the approval by the research and ethical review committee of Faculty of Allied Health Sciences, University of Peradeniya. SPSS 16.0 was used in statistical analyses.

The highest educational qualification of parents' was investigated from Part A of the questionnaire and parents' education level was evaluated according to a standard marking scheme. Occupations were categorized according to the "Occupational Prestige Scale" by Gunawardhana (1996). He categorized occupations into high level occupations and low level occupations.

To assess the learning style of undergraduate nursing students' part B of the questionnaire was used. In part B, there were four panels corresponded to the four learning style scales: Concrete Experience (CE), Reflective Observation (RO), Active Experimentation (AE), and Abstract Conceptualization (AC). Each panel consisted of six items and participants were asked to place the number "4" beside the statement which best described them, "3" to the second, "2" for the third, and "1" for the statement least appropriate. To compute scale scores the rank number for each item in the individual panel was summed. Panel A refers to CE, panel B to RO, panel C to AE, and panel D to AC. To identify the learning style of each person, two combination scores, "AC - CE" and "AE - RO" were used. Figure 1 below shows the row scores for these two scales on the crossed line.

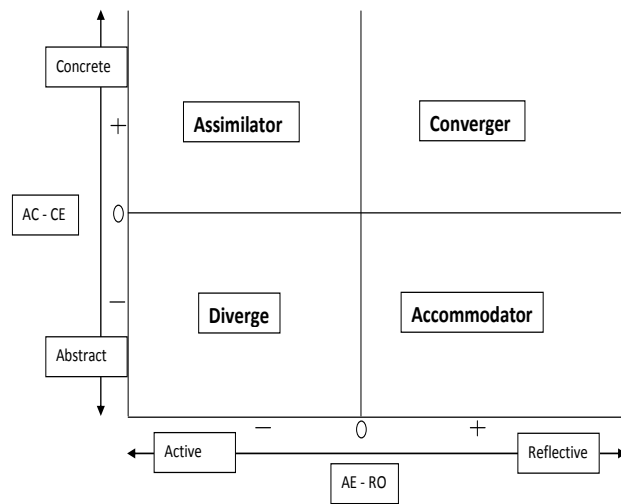


Figure 1. Learning Style Type Grid (Source: Kolb et.al, 1995)

III. RESULTS

A. Distribution of Learning styles among the Participants

From the total of 120 participants in the study, majority were females and only 31(26 %) were male students. The analysis of learning styles revealed that the majority of the students belong to the converging (n= 49, 40.8%), and accommodating (n= 46, 38.3%) groups. Numbers of students in the diverging and assimilating groups were 20 (16.7%) and 5 (4.1%) students, respectively. Figure 2 shows the distribution of learning styles among the study group.

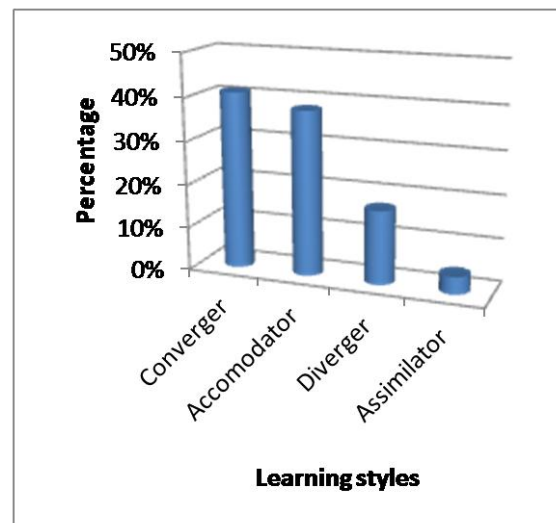


Figure 2. Distribution of learning styles

01) Concrete experience: When considering concrete experience, major representative area belonged to the

statement "Need valuable information to learn new things" category (18.16 %) which would have higher value as "almost always" direction. " Need practical examples when learning new theory" was the second most responded variable (17.57%) and " Getting involved in learning new things became as third place" (17.18 %). However, "Having difficulty if cannot relates concepts to physical things" had scored as minimal representative value which was around 13.83 % as "rarely" low scaled direction.

02) *Reflective observation*: The results revealed that under reflective observation panel, major representative area belonged to the statement, "Listen to other peoples' opinions rather than giving opinions" (19.87%) and "Tend to remain silent in group discussion" had scored as minimal representative value which was around 14.41 % as "rarely" low scaled direction.

03) *Abstract conceptualization*: When considering the abstract conceptualization panel major representative area belonged to the statement "Active participation in group discussion"(17.67%) which had higher value as "almost always" direction. "Active initiation in the learning process "and "Prefer new approaches in problem solving "scored second and third most responded variables with percentages 17.47% and 17.21% respectively.

04) *Active experimentation*: The results revealed that under the active experimentation panel "Evaluate ideas by logical thinking " and "Solving problems by analyzing logical relationships" had scored first and second representative areas, 18.33% and 17.75% respectively. However "Can relate to abstract concepts without physical examples "and "Learn best by formulating theories "scored minimal representative values.

According to chi square test, all four variables (AC, CE, RO and AE) had zero value for P value which was indicated that all four variables distributed as independently at 95% level of confidence.

B. Learning styles and gender

Among the 120 students majority were females. The distribution of students learning styles according to the gender is shown in Figure 2. According to the results most male students had convergent learning style (51.6%), while the female dominant learning style was accommodating type (41.6%).

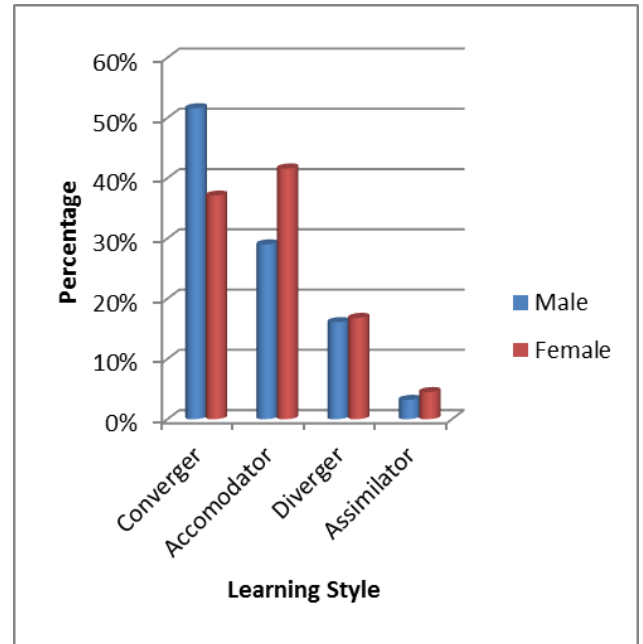


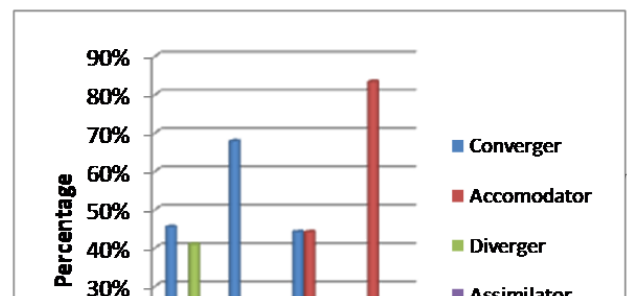
Figure 3. Distribution of student learning styles with respect to gender

C. Learning styles and academic year

According to the results most of the participants were fourth year undergraduates (36) followed by third year undergraduate (34). As shown in Figure 4 except Assimilators, Fourth year students had exponentially increasing behaviour from Divergers to Accommodators. So it is obvious that Divergers and Convergers could be captured easily among any academic year level. However accommodators' frequency was higher in final year undergraduates.

D. Parents' education and learning style of the student

Parents' educational level was categorized according to the standard marking system developed by Pashler et al., 2009. From this marking system, he categorized the parents' educational level to high level and low level education. The distribution of learning styles and level of parents' education is shown in the Table 1. Chi-Square test was done to find out the relationship between the parents' education level and learning styles. There was no significant relationship evident between parents' education level and learning styles.



the fathers' occupational level and learning styles. In this study, significant relationship wasn't found between fathers' occupation and learning styles. Similarly, there was no significant relationship between the mothers' level of occupation and learning style of the student.

III. DISCUSSION

Understanding how people learn is important in order to improve the teaching and learning environment, and most critically to actually improve an individual's learning. (Romanelli et al., 2009) Nurses function in a challenging environment where they are required to utilize various methods of learning to process, integrate, and disseminate information when appropriate.

A. Distribution of Learning styles among the Participants

The results of this study will be useful in understanding the range of different learning styles that exist among undergraduate nursing students in university of Peradeniya. This study found that the predominant learning styles were converging and accommodating, resulting in 41% and 38% respectively with lower numbers of students utilizing diverging (17%) and assimilating (4%) styles of learning. Nursing profession has always emphasized not merely learning from textbooks but also gaining experience directly from patients themselves (D'Amore et al., 2012).

Figure 4. Distribution of learning styles in each academic year

E. Parents' occupation and learning style of the student

Parents' occupational level was one of the main influencing factors towards the students learning styles. To find out that, the level of occupation was categorized and 61% fathers belonged to high level occupations and 39% into low level occupations. Large numbers of mothers were in the low level occupation group (65%). The distribution of learning styles and level of parents' occupation is shown in Table 1. Chi-Square test was performed to find out the relationship between

Table 1. Distribution of student learning styles with respect to parents' educational background and occupation

| | Diverger | | Assimilator | | Converger | | Accommodator | | Total | |
|---------------------------------|----------|-------|-------------|------|-----------|-------|--------------|-------|-------|-----|
| | n | % | n | % | n | % | n | % | n | % |
| Father's educational background | | | | | | | | | | |
| High level education | 11 | 15% | 3 | 4% | 30 | 42% | 28 | 39% | 72 | 100 |
| Low level education | 9 | 18.8% | 2 | 4.2% | 19 | 39.6% | 18 | 37.5% | 48 | 100 |
| Mother's educational background | | | | | | | | | | |
| High level education | 11 | 14.5% | 3 | 3.9% | 29 | 38.2% | 33 | 43.4% | 76 | 100 |
| Low level education | 9 | 20.5% | 2 | 4.5% | 20 | 45.5% | 13 | 29.5% | 44 | 100 |
| Father's occupation | | | | | | | | | | |
| High level occupation | 10 | 13.7 | 4 | 5.5 | 33 | 45.2 | 26 | 35.6 | 73 | 100 |
| Low level occupation | 10 | 21.3 | 1 | 2.1 | 16 | 34 | 20 | 42.5 | 47 | 100 |
| Mother's occupation | | | | | | | | | | |
| High level occupation | 8 | 19 | 2 | 4.8 | 15 | 35.7 | 17 | 40.5 | 42 | 100 |
| Low level occupation | 12 | 15.4 | 3 | 3.8 | 34 | 43.6 | 29 | 37.2 | 78 | 100 |

Perera (1999) has investigated the learning style distribution among first year undergraduates in three Sri

Lankan Universities in 1999. There were 34% convergers, 29% accommodators, 10% divergers and 25%

assimilators in the students who enrolled in Engineering. This shows some similarity between these two academic disciplines. This may be due to practical based learning rather than more theory based learning involved in the two professional fields.

Zamanzadeh et al., (2005), in a descriptive study performed in Tabriz University of Medical Sciences in Iran have shown that the majority of Nursing and Midwifery students were convergers (54%) and assimilators (32%). In this study 250 nursing and midwifery students were selected by census sampling method. The research tool was David Kolb's learning styles inventory. This result agrees with the present study to some extent because most of the students follow converging learning style.

Moreover, additional support in favour of our study is provided by another study done on nursing students at Faculty of Applied Medical Sciences, Al-Jouf University, Saudi Arabia (El-Gilany and Abusaad Fel, 2013). This study was performed to determine Saudi nursing students' readiness for self-directed learning; to identify their learning styles and to find out the relationship between these two concepts. Data was collected from two hundred and seventy-five undergraduate Saudi nursing students using self-administered questionnaires covering the demographic features of students, Fisher's self-directed learning readiness (SDLR) scale, and the Kolb's learning styles inventory. The percentages of converger, diverger, assimilator and accommodator learning styles were 35.6%, 25.8%, 25.55% and 13.1%; respectively. They concluded that the high level of SDLR and the dominant converger learning style among undergraduate nursing students would have a positive implication for their education and post-employment continuing nursing education.

B. Learning styles and gender

According to the objectives of our studies, data regarding gender and learning styles of the students were computed in order to find out possible relationships. In the sample there were 31 male students and 89 female students. The study revealed that the representation of male students in the convergent learning styles was more than those of female students. Convergers combine abstract conceptualization and active experimentation (Kolb, 1984). They apply their knowledge to examine problems and they prefer practical application of ideas and work on technical problems. On the other hand, the female students expressed a more tendency towards accommodating learning style combining active experimentation and

abstract conceptualization. They are attracted to new challenges and experiences, and to carrying out plans.

One of the studies conducted in Saudi Arabia on 518 medical students showed that the majority of convergent and accommodating learning styles were seen in male students more than females (85 % and 60% respectively) while the majority of divergent and assimilating styles were seen in female students. (60 % and 56% respectively). (Buali et al., 2013).

C. Learning styles and academic year

In the initial preparation of nursing students for clinical procedures, the students observe a procedure performed by the instructor. This procedure is then demonstrated by the student based on what was communicated. Therefore nursing students must be able to integrate didactic with practical application in their nursing training program. It is very important if the academics know the learning style preferences of the students from first year up to the final year. As per the results of this study most of the first year students represented converging and diverging styles and accommodators' frequency was higher in final year undergraduates. The final year students appear to cluster into the active experimentation and concrete experience portion of the learning cycle. Final year nursing students in the fourth year of their education go to the hospital more often than the previous years and encounter patient more frequently. These students learn to utilize critical thinking skills when assessing and caring patients.

These findings were supported by Amore and James (2012) who examined the learning styles of first-year undergraduate nursing and midwifery students. The majority of first-year students investigated in this study were divergers (29.5%), followed by assimilators (28.8%), accommodators (23.9%) and convergers (17.9%).

Salehi, (2007) has shown that the relationship between academic years and abstract conceptualization was found statistically significant as well as between academic years and active experimentation. In comparison with seniors, juniors were more likely to use active experimentation ($p < 0.05$). In comparison with all other students seniors were more likely to use abstract conceptualization to active experimentation ($p < 0.05$) in a study conducted for nursing Students at Isfahan Medical Sciences University to assess learning styles. Cross tabulation was used to test for a relationship between learning style and student academic year of study in the curriculum.

D. Socioeconomic background and learning style of the student

Several authors have proposed correlations between culture and learning styles. This is predicated on the concept that culture influences environmental perceptions which, in turn, to some degree determine the way in which information is processed and organized. Culture also plays a role in conditioning and reinforcing learning styles. (Romanelli et al., 2009). In this study, cross tabulation was used to test for a relationship between learning style and parent educational status and parent occupation. The significant relationship wasn't found between learning styles and father or mothers' educational level. Similarly, there was no significant relationship between learning styles and parents' occupational status.

Sri Lankan students enter the university after completing their secondary education. Until then they live with their family. They learn from their family members, especially, mother and father. For that learning, parents' level of education is very important. If parents were highly educated they can teach some methods of learning to their children. Also parents' level of occupation is another important aspect of child education. Because, if parents' were involved in high level occupation their income would be high and they can provide valuable things to support their children's learning, such as computers and access to internet. So it can change the learning style of children. So family background can affect their learning styles.

BSc Nursing is a clinical based degree and students have clinical exposure after the first semester. They learn a lot of things during their clinical periods. In the hospital they are working in groups. They are caring for and solving problems of clients and visitors. For this kind of work, they help each other. According to those kinds of situations and things they were able to following the useful methods other than they were used early. It means factors in the university were influencing the learning styles of BSc Nursing undergraduates other than the factor of their family.

III. CONCLUSION

The importance of learning style could help academics to understand students' preference of learning that could assist in selecting appropriate instructional methods and educational options as well as it is important to identify the individual learning styles for students themselves when learning a clinical based stream like nursing with more than the theoretical component.

The study realized that majority of nursing students belong to converger (41%) learning style and accommodator (38%) learning style. Therefore,

baccalaureate programs should be structured to enhance learning by assisting and motivating learners to understand, and solving problems appropriate to their own learning styles.

The study revealed that the representation of male students in the convergent learning styles was more than those of female students. On the other hand it was found that accommodators' frequency was higher in final year undergraduates while most of the first year students represented converging and diverging styles.

The factors associated with learning style were considered and it was realized that there was not a significant relationship of socioeconomic background towards the student's learning style. It could be influenced by other factors such as hypermedia based learning, cultural influences etc. So this research can further be extended on to find out other factors associated with learning style preferences.

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