The Disposition Of The Undergraduate University Nursing Students Toward Critical Thinking

Ghada M.Samir El-Hessewi, Clinical Instructor
Faculty of Nursing, Alexandria University.

Mary Kelada Harmina, Professor
Nursing Administration, Faculty of Nursing, Alexandria University.

Nadia Taha Mohamed, Professor
Critical Care Nursing, Faculty of Nursing, Alexandria University.

Mohamoud Abd El-Halim Mansi, Professor
Chairman of Educational Psychology, Faculty of Education, Alexandria University.

Nora Ahmed Bassiouni, Lecturer
Nursing Administration, Faculty of Nursing, Alexandria University.

Abstract

Thinking is essential to a safe, competent, skillful nursing practice. It helps nurses to identify options from which to choose solutions in client care situations. The disposition toward critical thinking was considered to be crucial to a good critical thinker. Accordingly, the seven critical thinking dispositional characteristics, which are constituents of an overall disposition toward critical thinking were identified, namely: Truth seeking, Open-mindedness, Analyticity, Systematicity, Self-confidence, Inquisitiveness and Maturity. The aim of this study was to determine critical thinking disposition among Alexandria University undergraduate nursing students. The study was carried out in all the four academic year at the Faculty of Nursing, Alexandria University. The sample comprised all undergraduate nursing students of the four academic years (N= 752). The California Critical Thinking Disposition Inventory (CCTDI) developed by Facione P. and Facione N. (1990) was used to collect data concerning the disposition of the undergraduate nursing students towards critical thinking. It consists of two parts: the first part, included the demographic data of the students. The second part, consisted of 75 items grouped into the previously mentioned seven dispositional characteristics. All items of the seven dispositional characteristics were scrambled. Students responded using a 6-point Likert scale ranging from “strongly agree” to “strongly disagree”. Undergraduate nursing students of the four academic years got the highest mean scores in the dispositional characteristic of Inquisitiveness and Analyticity. Meanwhile, they got the lowest mean scores in the dispositional characteristics of Truth seeking and Open-mindedness. The mean scores of the first year students were the highest in all of the dispositional characteristics except in Truth seeking. A statistical significant difference was found in relation to mean scores of the undergraduate nursing students of the four academic years in relation to all of the dispositional characteristics except for the dispositional characteristic of Self-confidence. The study showed that the majority of the undergraduate nursing students at the Faculty of Nursing, University of Alexandria regardless of their academic year showed ambivalent disposition towards most of the dispositional characteristics and the overall CCTDI. They got the highest mean scores in Inquisitiveness and Analyticity. Meanwhile, they got the lowest mean scores in Truth seeking and Open-mindedness.
Introduction:

Critical thinking is essential to a safe, competent, skillful nursing practice. It helps nurses to identify options from which to choose solutions in client care situations\(^{(1)}\). The growing complexity of health care demands the use of critical thinking for effective, creative and efficient nursing care\(^{(2)}\). Both the American Association of Colleges of Nursing (AANC, 1986) and the National League for Nursing (NLN, 1991) have identified the development of critical thinking as an essential component of baccalaureate nursing education\(^{(3)}\).

The disposition toward critical thinking was considered to be crucial to a good critical thinker, as the requisite of the core cognitive skills. The critical thinker characteristics were described as “a set of attitudes that define a personal disposition or tendency to use critical thinking in one’s personal, professional and social life”\(^{(4,5,6)}\). Accordingly, the seven critical thinking dispositional characteristics, which are constituents of an overall disposition toward critical thinking, were identified, namely: truth seeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness and cognitive maturity\(^{(5)}\).

Truth seeking targets the disposition of being courageous about asking questions and honest about pursuing inquiry even if the findings do not support one’s self-interests. Open-mindedness; targets the disposition of being tolerant of divergent views with sensitivity to the possibility of one’s own bias. Analyticity targets prizing the application of reasoning and the use of evidence to resolve problems, anticipating potential, perceptual, practical difficulties and consistently being alert to the need to intervene. Systematicity measures the tendency toward organized, orderly and diligent inquiry. Self-confidence measures the trust one places in one’s own reasoning process and soundness of one’s judgment. Inquisitiveness targets one’s intellectual curiosity and desire for learning even when the application of knowledge is not readily available. Cognitive maturity targets disposition to be judicious on one’s decision making and approaching problems in time-pressured environment \(^{(7)}\). For nurses to develop critical thinking skills, the process must begin early in their nursing education and practice \(^{(8,9)}\). Hence, Nurses who practice critical thinking learn how to solve problems and seek new information, they maintain an open-minded and questioning attitude, they realize that knowing the process of solving problems is more important, than having all the answers\(^{(10)}\).

Studies done in U.S.A. by Walsh and Hardy\(^{(6)}\) investigated the dispositional differences in critical thinking related to gender and academic major and revealed that the female scores in both practice and non practice disciplines were higher than males on Open-mindedness and Maturity.
They also mentioned in their article a research conducted by Facione et al (11), which studied the students’ dispositions toward critical thinking at a private university. However, no studies were detected in Egypt in this respect.

**Aim of the Study**

The aim of this study is to assess dispositions of the undergraduate nursing students toward critical thinking at the faculty of Nursing, Alexandria University.

**Material and Methods:**

**I- Material**

*Design:* descriptive research design

*Setting:* The study was conducted at the Faculty of Nursing, Alexandria University.

*Subjects:* The subjects included in the study were 752 nursing students out of 928 nursing students, distributed among the four academic years were: first year (N =165), second year (N=205), third year (N =187), and fourth year (N=195). One hundred and seventy six nursing students from the four academic years were not included in the study for the following reasons: 34 students were absent at the time of collecting data, 42 students refused to participate in the study, 30 students were taken as a pilot study. Also, 70 students were doublers of one or two courses and consequently their names were found repeated in the list of more than one academic year. They were listed as doublers of one or two courses in a certain academic year and were repeated in the list of their present academic year.

*Tool:* The California Critical Thinking Disposition Inventory (CCTDI) developed by Facione and Facione (2000 update) was used to collect data concerning the disposition of the undergraduate nursing students towards critical thinking, at the Faculty of Nursing, Alexandria University(5). It consists of two parts

*Part I:* It includes the demographic data of the students i.e., students’ name, age, educational qualification and academic year.

*Part II:* It consists of 75 items grouped into seven dispositional characteristics, namely: Truth seeking (12 items), Open-mindedness (12 items), Analyticity (11 items), Systematicity (11 items), Self-confidence (9 items), Inquisitiveness (10 items), and Maturity (10 items). All items of the seven dispositional characteristics were scrambled. Students responded using a 6-point likert scale ranging from “strongly agree” to “strongly disagree”. The CCTDI reports eight scores: seven scores for each dispositional characteristics and an overall CCTDI score.

**II- Methods**

1. An official agreement was obtained from the head of each department in the Faculty of Nursing, Alexandria University to collect the necessary data.
2- The questionnaire was translated into the Arabic language. Both the Arabic and English questionnaires were submitted
to five experts from the English section, Faculty of Literature, Alexandria University. To be reviewed for its translation.

3- The Arabic and English questionnaires were submitted to ten experts in the field of Educational Psychology to determine its content validity. Reliability test was done for inter–item correlation and the test re-tests method with four weeks interval on the same students.

4. Pilot study: A pilot study was carried out on 30 students selected randomly from the different academic years to check and ensure the clarity of the Arabic questionnaire, identify obstacles and problems that may be encountered during data collection and to estimate the time needed to complete the questionnaire items. Based on their opinions few statements were rephrased.

5. Data collection: Data were collected from all undergraduate nursing students at the Faculty of Nursing, Alexandria University to determine critical thinking dispositions among them. Students were approached while in classrooms, library or at break time. Needed instructions were given before the distribution of the questionnaire. The data collection took a period of four months, from 20/4/2001 to 20/8/2001.

6. Statistical analysis:

A- Reliability measures:

Cronbach’s alpha was used to measure the inter-item correlation. It is based on correlations of items on a single scale. It is a measure based on the internal consistency of the items.\(^{(12)}\)

b. Guttmann split-half reliability was used to measure the reliability of the overall test.\(^{(12,13)}\)

c- Data was organized, computerized, tabulated, and analyzed using quantitative and qualitative approaches.

I. Quantitative Analysis:

1- The mean score and standard deviation for each of the seven characteristics were measured. The ANOVA (F test) was used to compare the significant difference of means for the seven dispositional characteristics and the overall CCTDI score, with level of significance \(P > 0.05\) \(^{(13)}\).

2- Follow-up univariante analysis of variance with post-hoc scheffé test to determine where the significant difference lies.\(^{(13)}\)

The t-test was used to compare the sample means to judge whether an observed difference is as a result of chance or as a result of significant difference\(^{(12,13)}\).

II. Qualitative Analysis:

Data were expressed as number and percent of each character according to its level [strong (> 60), ambivalence (30-40), weak (< 30)]. While the overall score was expressed as follows: [outstanding (>310)
strong (280-309), ambivalence (210-279), opposed (210)]. A comparison of the significant difference of frequencies was carried out using the “chi-square test”(X2), with level of significance P>0.05.\(^\text{(12,13)}\)

**Results:**

Table 1 shows that the educational background of the majority of nursing students was secondary school certificate compared to those with technical health institute diploma. The distribution of the students with secondary school certificate were: **100%** of the first academic year, **88.3%** of the second academic year, **86.1%** of the third academic year, and **87.7%** of the fourth academic year. While the students with diploma constituted **11.7%** for the second, **13.9%** for the third and **12.3%** for the fourth years.

Table 2. points out that the mean score was the highest among the first academic year in relation to the dispositional characteristics specifically **Open-mindedness** 34.9±4.07, **Analyticity** 42.52 ± 4.55, **Systematicity** 38.7 ± 5.74, **Self-confidence** 39.48±5.32, **Inquisitiveness** 51.61 ± 4.74, and **Maturity** 38.26±6.03. Meanwhile, the mean score was the lowest in relation to **Truth seeking** 31.49±6.59, 30.56±6.06 among first and fourth years, **Open-mindedness** 33.73±4.03 among the third year, **Systematicity** 36.01±5.45, 34.31±5.16 among second year. A statistical significant difference was found in relation to most of the dispositional characteristics between the academic years' mean scores namely **Truth Seeking** F=83.78, **Open-mindedness** F=2.7, **Analyticity** F=4.77, **Systematicity** F= 7.77, **Inquisitiveness** F=32.45, **Maturity** F= 2.58

Table 3 shows that **34.2%** of the nursing students of the third year compared to **6.7%** of the students of the fourth year got strong dispositional level toward "Truth seeking". On the other hand, **46.2%** of the fourth year students, **41.8%** of the first year students got a weak toward "Truth seeking". Moreover, most of the students in all of the academic years had an ambivalent disposition toward "Truth seeking".

Table 4 points out that **13.3%** of the students of the first year compared to **4.8%** of the students of the third year got a strong of **Open-mindedness**. Furthermore, **14.4%** of the third year students were at weak of **Open-mindedness** as compared to the other academic years namely: first year **9.7%**, fourth year **10.8%** and second year **11.2%**. Additionally, more than two third of the students in all of the academic years had an ambivalent disposition toward **Open-mindedness**.

Table 5 shows that most of the students in all of the academic years had a strong dispositional level toward **Analyticity**. Besides, **1%**, **2.1%**, **2.6%** of the second year, the third and fourth years students were at weak dispositional levels...
of Analyticity respectively, and none of the students of the first year were found at this dispositional level. This table also revealed that 24.2%, 38.5% 32.6% and 36.9% of the first, second, third and fourth year students respectively got an ambivalent dispositional level toward Analyticity.

Table 6 shows that 47.3% of the students of the first year compared to 25.4% of the students of the second year got strong of Systematicity. On the other hand, 11.7% of the second year students were at weak of Systematicity as compared to the other academic years namely: of the 10.8% fourth year, 8.6% of the third year and 6.1% of the first year students, the table also revealed that 62.9% of the second year students as compared to the other academic years namely: third year 61%, fourth year 58.5% and first year 46.7% were at the ambivalent level.

Table 7 points out that more than half of the students of the third and first years 55.6% and 52.1% respectively got strong of Self-confidence. Furthermore, 8.7% of the fourth year students were at weak of Self-confidence as compared to the other academic years namely: second year 7.8%, third year 7% and first year 3.6%. In addition, 52.7% of the students of the second year had an ambivalent disposition toward Self-confidence.

Table 8 illustrates that nearly all of the students of the first year 98.8% compared to 93.2% of the students of the second year, 87.7%of the fourth year and 86.6% of the third year students got strong of Inquisitiveness. In addition, the minority of students among the four academic years were at weak of Inquisitiveness i.e., 2.1% of the third year, 1.5% of the fourth year and 0.5% of the second year, besides none of the students of the first year were found at this. This table also revealed that 11.2% of the third year students were at ambivalent of Inquisitiveness compared to the other three academic years namely; fourth year 10.8%, second year 6.3% and first year 1.2%.

Table 9 points out that that 44.2% of the students of the first year compared to 31.2% of the students of the second year got strong of "Maturity". On the other hand, 11.8% of the third year students as well as fourth year students were at weak of "Maturity" as compared to the second and first years 8.3%, 6.7% respectively. Moreover, nearly half of the students among all of the academic years had the ambivalent disposition toward Maturity

Table 10 Shows that the highest percentages of the dispositional level were devoted to ambivalent level among the four academic years namely; first year 55.2%, second year 63.5%, third year 61.0%, and fourth year 73.8%.
Discussion:

Nursing educators in response to the rapidly changing healthcare environment have emphasized the need for critical thinking in nursing education. Accordingly, the development of critical thinking among undergraduate nursing students has become a vital educational goal and the focus of research on undergraduate education.

Results of this study revealed that nursing students in the majority of the dispositional characteristics regardless of their academic years showed ambivalent disposition towards critical thinking. The same was reported by Bers et al (1996). This findings also go with Wan et al (2000) findings. who noted that students who choose nursing in tertiary education are usually not on the top grade and regarded as 'average students'. Moreover, the admission interview conducted at the faculty of Nursing, Alexandria University to new applicants includes a written aptitude test and an English language test in addition to an oral interview for examining the new applicants' general appearance, social status and general knowledge. However, it does not include an assessment tool, which aims to assess critical thinking disposition for the new applicants. As to Facione et al (1997), with the CCTDI as an assessment tool, teaching staff will be able to have research-based discussion about students’ weaknesses in relation to critical thinking and how this weakness may limit their ability to make sound judgment.

Nursing students' mean scores were high in Analyticity and Inquisitiveness. This finding is consistent with the findings of Wilson (1998), May et al (1999), Blair and Nighbor(2000), and McCarthy (2001). This may indicate that the majority of nursing students have the disposition of being alert to potential problematic situations, anticipate possible results and prize the application of reason and the use of evidence.

Nursing students were considerably low in Truth Seeking and Open mindedness. These results are in accordance with Facione et al (1998) who affirmed in his study that the majority of individuals are not disposed to seek the truth courageously. They also added that although there are exceptions and individual pattern differences, most of those many thousands of individuals' surveyed appear to be inclined to discount evidence, which argues against their fixed idea, and not to engage in questions or problem where the solutions might be disturbing.

In analyzing the critical thinking dispositional characteristics among the nursing students of all academic years, it was surprising to find that the mean scores of the first year students were the highest in all of the dispositional characteristics except in Truth Seeking.
The explanation could be related to the system of admission to the Egyptian Universities which depends on the policy of the Supreme Council of Universities; the total grade the student acquire in the secondary education. So students of the first academic year may have got higher grades than their colleges of the other academic years. In this respect, Giancarlo (1996) indicated that the disposition toward critical thinking positively correlates to the academic success indicators (25).

As regards Truth seeking the mean score of this dispositional characteristics were the highest among third year nursing students. This is understandable as third year nursing students are mainly concerned with pediatrics and obstetrics in which students as females have the interest and motive to know more in relation to these areas for their won self and for significant others. More over, multi media such as television and radio programs play an important role as a source of information, which increases their interest to compare and evaluate what is given in the multi media, based on the scientific information they have been taught. These results are consistent with Tappen (1995) who emphasized that when some kind of evidence, fact or opinion is given to support a point of view, truth seekers evaluate this evidence in terms of its accuracy, consistency, linkage and relationship to other ideas (26).

On the other hand, truth seeking were found to be less among nursing students of the other three academic years which may be due to the teacher-student relationship in which students are not encouraged to ask questions.

Concerning open-mindedness, results showed that open-mindedness mean score were lower among nursing students of the second, third, and fourth years than those of the first year. This may be due to the inappropriate application of the discussion and role-play as teaching strategies which may revert to the large number of nursing students in relation to number of teaching staff, and lack of time. In addition, during lectures nursing teachers are concerned to provide the content in time. Paul (1995) necessitated for the use of role play as teaching strategy in which students assume the roles of the others, usually spontaneous interactions that are observed by others for analysis and interpretation (27). Palzer et al (2000) illustrated that discussion is useful in which students listen to each other actively and share their different view point in a manner which enable them to believe that there was not right or wrong answer to a particular problem (28). Bassiouni (1995) found that the competencies included in this strategy such as: writing objectives of the discussion, identifying learning needs and problem areas in students and maintaining group control during the
discussion were not displayed by the clinical teachers\(^{29}\).

According to Paul (1990), without scrupulous care, teachers may pass on to students their own close mindedness\(^{30}\).

In relation to Analyticity, results denoted that the mean score of these dispositional characteristics were lowest among nursing students of the fourth academic year, although "methods of research" and "statistics" courses are taught in this academic year which are expected to promote the analytical skills among them. Teague and Michael (1995) confirmed that assignment which challenge students to develop themes which require them to synthesize and analyze material are better suited to develop analyticity\(^{31}\).

As regards to Systematicity, results revealed that nursing students of second and fourth years got the lower mean scores than nursing students in the first and third years. This may be due to the inconsistent use of the suitable instructional strategies as case studies .Hawke (2000) indicated that nursing educators would need more tools such as case studies to teach students the ability to organize their thoughts in a clear and accurate manner. She added that the use of case studies in the most effective strategy to find out how the learner designs care \(^{32}\). This is parallel with Myers et al (1991) who stated that the teaching student learn how to obtain, organize, and use to solve complex problems is an empowering activity that prepare them for lifelong learning\(^{33}\).

As to self-confidence, findings of this study revealed that nursing students of the second, third, and fourth academic years are less confident in themselves than first year students. This may be due to the negative interpersonal relationship with clinical instructors, hospital staff, patients and visitors. King (1995) recommended the use of questions in the classroom in two ways: Reciprocal Peer Questioning: in which students following the lecture, students write questions about the lecture material, then they ask each other these questions and afterwards the whole class discuss some of the questions written from each small group The Reader’s Questions: in which students are required to write questions on the assigned reading and ask them at the beginning of the class. The teacher then selects some of these questions as impetus for the class discussion \(^{34}\). This stands with Marton (1987) who illustrated that quality of instructor-student interaction impacts directly in students' self-confidence. Scolding or Warning in front of others leads to further embarrassment and decreased self-confidence and constructive criticism should be the rule \(^{35}\). Reizan (1978) mentioned that when a students' self image is reinforced by the teachers, this will increase students feeling of self-confidence, dignity and self-respect \(^{36}\).

Also, nursing students of the second, third and fourth academic years are required to perform unfamiliar nursing
procedures with which require close supervision and time to be performed safely. Walsh and Hardy (1999) pointed out that low levels of confidence among nursing students may relate to many critical decisions which must be made and any mistake could be costly.\(^{(6)}\)

Also, the evaluative strategies used by clinical instructors may be less helpful in building the students' self-confidence as a nurse. The same was reported by Nabawy et al (1989), who added that evaluative strategies are too often based on what is wrong or omitted rather than what is correct. In these situations, nursing students are likely to feel threatened by the instructor rather than assisted\(^{(37)}\).

As to inquisitiveness, the results showed that scores of the nursing students of the second, third, and fourth academic years were significantly lower than those of the first academic year. This may be due to the teaching strategies used may not be motivating for the students’ desire for learning. In this respect.

In relation to Maturity, results of this study showed that nursing students of the fourth year got the least mean score. These results were unexpected since the older the age the more mature an individual would be. Other factors that may affect the degree of individuals' maturity are experiences, and economic factors. Powel and Luzon (1987) demonstrated no relationship between age of participants and their levels of maturity. They declared that this might be due to the uniform program activities at the college or to other factors such as exposure to experiences that may be more influential in the development of maturity than age\(^{(38)}\).

**Conclusion:**

The study showed that the majority of the undergraduate nursing students at the Faculty of Nursing, University of Alexandria regardless of their academic year showed ambivalent disposition towards most of the dispositional characteristics and the overall CCTDI. They got the highest Mean Scores in the Dispositional Characteristics of Inquisitiveness and Analyticity. Meanwhile, they got the lowest mean Scores in the dispositional characteristics of Truth Seeking and Open Mindedness. Mean scores of the undergraduate nursing students for each of the four academic years in relation to each of the seven dispositional characteristics were the highest among the students of the first year in most of the dispositional characteristics. a statistical significant difference was found in relation to their mean scores of all the dispositional characteristics except for the dispositional characteristic of self-confidence. Also, there was no significant difference between the educational qualifications (secondary school certificate and technical health institute diploma the undergraduate nursing students and their mean scores of the seven Dispositional characteristics and their over all CCTDI score, except for the dispositional characteristic of analyticity.
Recommendations:

In the light of the findings, the following recommendations are suggested;

Nursing program:

1. Nursing educational programs should follow steps that systematically develop these seven dispositional characteristics among the students of the four academic years.
2. Nursing programs should include critical thinking disposition assessment tool in their assessment plans. For example using the students' CCTDI profile.
3. Nursing curricula should emphasize the development of critical thinking and progressively independent decision-making.
4. Nursing curricula should also include direct explanation of the purpose, concepts and methods of good thinking dispositions.
5. Nursing programs should include the teaching strategies that promote critical thinking dispositions and ensure the application of all of its competencies.
6. Nursing programs should offer enough free time for the students to share in the extracurricular activities provided.
7. 'Time management training' would be necessary component of a successful nursing program.

Nursing educational administrators:

1. Nursing educational administrators must play an active role in designing critical thinking workshops emphasizing the concept and the importance of critical thinking, in addition to the teaching strategies needed for the development of critical thinking dispositions in nursing students.
2. Nursing educational administrators should take steps to plan "instructional development programs" for the aim of enhancing teaching abilities of novice nursing teachers.

Nursing teachers:

1. Nursing teachers should become models of good thinking dispositions; provide historical or literary examples of good thinking.
2. Nursing teachers must demonstrate critical thinking as content is presented through: thinking aloud and allowing students to think aloud while interacting with the content, so that the teacher can diagnose the inappropriate thinking processes and provide immediate constructive feedback.
3. Nursing teachers are responsible to cultivate the "critical spirit" in their students which includes attitudes, dispositions and traits of critical thinking.
4. Nursing teachers are also responsible to motivate their students to use these critical thinking dispositions while solving problems and making decisions in their personal and professional lives.
Study Critical Thinking

5. The teacher-evaluator role should be one that reinforces the students' desire for learning.
6. Nursing teachers can empower students by creating a risk-free environment that value students' contributions, encourage expression of their opinions, exploring mistakes objectively without embarrassing the students, and promote risk-taking.

Nursing Students:

1. Develop 'good habits of inquiry" (habits that aid in the search for the truth, like always keeping an open mind, verifying information and taking enough time) to make critical thinking more automatic.
2. Replace "I do not know" and "i am not sure" with "i'll find out" which demonstrates the ability to find answers and locate resources.
3. peer interaction that involve thinking disposition, in which students think together, discuss their thoughts with one another and so on, for the purpose of bringing thinking disposition alive for the students by fixing it in meaningful interpersonal interactions.

Further studies:

1. A longitudinal study (study groups them-selves from entry to exit of the academic process) would attempt to avoid the confounding variables that potentially exist between the different groups in the present study.
2. Study the relationship between age and the development of the mind habits toward critical thinking.
3. The critical thinking dispositions and skills of the nursing teachers and its effect on the type of teaching strategies they use.
4. This study should be replicated in different faculties of nursing in order to expand and validate findings.
## Table 1: Distribution of the undergraduate nursing students among the four academic years according to their educational background

<table>
<thead>
<tr>
<th>Educational background</th>
<th>First Year (N=165)</th>
<th>Second Year (N=205)</th>
<th>Third Year (N=187)</th>
<th>Fourth Year (N=195)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N°</td>
<td>%</td>
<td>N°</td>
<td>%</td>
</tr>
<tr>
<td>Secondary school certificate</td>
<td>165</td>
<td>100%</td>
<td>181</td>
<td>88.3%</td>
</tr>
<tr>
<td>Technical Health Institute diploma</td>
<td>-</td>
<td>-</td>
<td>24</td>
<td>11.7%</td>
</tr>
</tbody>
</table>

* N= 752

## Table 2: Comparison of mean scores of the undergraduate nursing students among the four academic years in relation to "Dispositional characteristics"

<table>
<thead>
<tr>
<th>Dispositional characteristics</th>
<th>First year Mean scores ±SD</th>
<th>Second year Mean scores SD</th>
<th>Third year Mean scores SD</th>
<th>Fourth year Mean scores &amp; SD</th>
<th>DF</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truth seeking</td>
<td>31.49± 6.59</td>
<td>36.88± 4.39</td>
<td>37.71± 4.79</td>
<td>30.56± 6.07</td>
<td>3</td>
<td>83.78</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Open-mindedness</td>
<td>34.9±4.07</td>
<td>34.31±4.16</td>
<td>33.73±4.03</td>
<td>34.65±4.22</td>
<td>3</td>
<td>2.7</td>
<td>0.05*</td>
</tr>
<tr>
<td>Analyticity</td>
<td>42.52±4.55</td>
<td>41.24±4.35</td>
<td>41.27±5.26</td>
<td>40.66±4.73</td>
<td>3</td>
<td>4.77</td>
<td>0.003*</td>
</tr>
<tr>
<td>Systematicity</td>
<td>38.7±5.74</td>
<td>36.01±5.45</td>
<td>37.1±5.58</td>
<td>36.59±5.6</td>
<td>3</td>
<td>7.77</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>39.48±5.32</td>
<td>38.29±5.95</td>
<td>39.27±6.39</td>
<td>38.84±6.76</td>
<td>3</td>
<td>1.49</td>
<td>0.216</td>
</tr>
<tr>
<td>Inquisitiveness</td>
<td>51.61±4.74</td>
<td>47.66±5.36</td>
<td>46.03±6.69</td>
<td>46.68±5.97</td>
<td>3</td>
<td>32.45</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Maturity</td>
<td>38.26±6.03</td>
<td>36.81±5.72</td>
<td>36.84±6.52</td>
<td>36.6±6.51</td>
<td>3</td>
<td>2.58</td>
<td>0.052*</td>
</tr>
</tbody>
</table>

*Statistical significant difference at (P ≤ 0.05)
Table 3: The dispositional level of the undergraduate nursing students among the four academic years toward "Truth seeking"

<table>
<thead>
<tr>
<th>Truth seeking</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong [&gt;40 ]</td>
<td>10.9</td>
<td>28.3</td>
<td>34.2</td>
<td>6.7</td>
<td>20.4</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>47.3</td>
<td>67.8</td>
<td>60.4</td>
<td>47.2</td>
<td>56.1</td>
</tr>
<tr>
<td>Weak [&lt;30 ]</td>
<td>41.8</td>
<td>3.9</td>
<td>5.3</td>
<td>46.2</td>
<td>23.5</td>
</tr>
</tbody>
</table>

Table 4: The dispositional level of the undergraduate nursing students among the four academic years toward "Open-mindedness"

<table>
<thead>
<tr>
<th>Open-mindedness</th>
<th>First year N=165</th>
<th>Second Year N=205</th>
<th>Third Year N=187</th>
<th>Fourth Year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong [&gt;40 ]</td>
<td>13.3</td>
<td>8.8</td>
<td>4.8</td>
<td>12.8</td>
<td>9.8</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>77</td>
<td>80</td>
<td>80.7</td>
<td>76.4</td>
<td>78.6</td>
</tr>
<tr>
<td>Weak [&lt;30 ]</td>
<td>9.7</td>
<td>11.2</td>
<td>14.4</td>
<td>10.8</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Table 5: The dispositional level of the undergraduate nursing students among the four academic years toward Analyticity

<table>
<thead>
<tr>
<th>Analyticity</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong [&gt;40 ]</td>
<td>75.8</td>
<td>60.5</td>
<td>65.2</td>
<td>60.5</td>
<td>65</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>24.2</td>
<td>38.5</td>
<td>32.6</td>
<td>36.9</td>
<td>33.5</td>
</tr>
<tr>
<td>Weak [&lt;30 ]</td>
<td>-</td>
<td>1</td>
<td>2.1</td>
<td>2.6</td>
<td>1.5</td>
</tr>
</tbody>
</table>

ASNJ. Vol. 6, No. 2, 2007
Study Critical Thinking

Table 6: The dispositional level of the undergraduate nursing students among the four academic years toward *Systematicity*

<table>
<thead>
<tr>
<th>Systematicity</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Strong [&gt;40 ]</td>
<td>47.3</td>
<td>25.4</td>
<td>30.5</td>
<td>30.8</td>
<td>32.8</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>46.7</td>
<td>62.9</td>
<td>61</td>
<td>58.5</td>
<td>57.8</td>
</tr>
<tr>
<td>Weak [&lt;30 ]</td>
<td>6.1</td>
<td>11.7</td>
<td>8.6</td>
<td>10.8</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Table 7: The dispositional level of the undergraduate nursing students among the four academic years toward *Self-confidence*

<table>
<thead>
<tr>
<th>Self-confidence</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Strong [&gt;40 ]</td>
<td>52.1</td>
<td>39.5%</td>
<td>55.6</td>
<td>45.1</td>
<td>47.7</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>44.2</td>
<td>52.7%</td>
<td>37.4%</td>
<td>46.2</td>
<td>45.4</td>
</tr>
<tr>
<td>Weak [&lt;30 ]</td>
<td>3.6</td>
<td>7.8</td>
<td>7</td>
<td>8.7</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Table 8: The dispositional level of the undergraduate nursing students among the four academic years toward *Inquisitiveness*

<table>
<thead>
<tr>
<th>Inquisitiveness</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Strong [&gt;40 ]</td>
<td>98.8</td>
<td>39.2</td>
<td>86.6</td>
<td>87.7</td>
<td>91.4</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>1.2</td>
<td>6.3</td>
<td>11.2</td>
<td>21</td>
<td>7.5</td>
</tr>
<tr>
<td>Weak [&lt;30 ]</td>
<td>_</td>
<td>0.5</td>
<td>2.1</td>
<td>1.5</td>
<td>1.1</td>
</tr>
</tbody>
</table>
Table 9: The dispositional level of the undergraduate nursing students among the four academic years toward "Maturity"

<table>
<thead>
<tr>
<th>Maturity</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Strong</td>
<td>44.2</td>
<td>31.2</td>
<td>35.3</td>
<td>32.8</td>
<td>35.5</td>
</tr>
<tr>
<td>Ambivalent [30-40]</td>
<td>49.1</td>
<td>60.5</td>
<td>52.9</td>
<td>55.4</td>
<td>54.8</td>
</tr>
<tr>
<td>Weak</td>
<td>6.7</td>
<td>8.3</td>
<td>11.8</td>
<td>11.8</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Table 10: The dispositional level of the undergraduate nursing students among the four academic years toward "CCTDI score"

<table>
<thead>
<tr>
<th>CCTDI score</th>
<th>First year N=165</th>
<th>Second year N=205</th>
<th>Third year N=187</th>
<th>Fourth year N=195</th>
<th>Total N=752</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Outstanding [&gt;310]</td>
<td>5.5</td>
<td>4.4</td>
<td>6.4</td>
<td>2.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Strong</td>
<td>39.4</td>
<td>31.2</td>
<td>31.0</td>
<td>23.1</td>
<td>30.9</td>
</tr>
<tr>
<td>Ambivalent</td>
<td>55.2</td>
<td>63.5</td>
<td>61.0</td>
<td>73.8</td>
<td>63.8</td>
</tr>
<tr>
<td>Opposed</td>
<td>-</td>
<td>0.5</td>
<td>1.6</td>
<td>1.0</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Study Critical Thinking

References:


ASNJ. Vol. 6, No. 2, 2007


27. Paul RW. How to prepare students for rapidly changing world. Santa
Study Critical Thinking


34. King A. Designing the instructional process to enhance critical thinking across the curriculum; inquiring minds really do want to know, using questioning to teach critical thinking. Teaching of Psychology 1995, 22(1):13-7


Study Critical Thinking