

Preferred Educational Strategies and Critical Thinking Dispositions among Nursing Students

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Abstract: Thinking dispositions are characterological in nature, and like many human character traits, they develop in response to immersion in a particular cultural milieu. The cultural milieu that best teaches thinking dispositions is a culture of thinking environment that reinforces good thinking in a variety of explicit ways. The effective program for teaching thinking dispositions, therefore, should create a culture of thinking in the educational system. Critical thinking is a desirable outcome; so to develop and practice critical thinking; educators need to re-consider course content and curricular strategies used to develop critical thinking. The study aimed to determine nursing students' preferences of educational strategies and their critical thinking dispositions. This study was conducted at the Faculty of Nursing, University of Alexandria. The subjects of this study consisted of (50%) of the total number of students of each academic level comprising 630 students. The students' total score of critical thinking dispositions had significant relation with nine preferred educational strategies out of twenty four. They strongly preferred the following educational strategies: role play, demonstration, portfolio computer assisted instruction/e- learning and panel discussion. While they moderately preferred the following educational strategies: interactive lecture, case study, questioning and nursing round. Finally, they never preferred written assignment. Based on the finding of this study annual assessment of students' CTDs using the CCTDI is carried to select educational strategies that reinforce the positive dispositions and change the negative and ambivalent ones towards the positive inclination.

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1. Introduction:

Critical thinking dispositions are the affective components of critical thinking. These dispositions are coupled with cognitive skills as essential components of ideal critical thinker. Critical thinking disposition is consistent willingness, motivation, inclination and drive to be engaged in critical thinking while reflecting on significant issues, making decision and solving problems. The Delphi project concluded that critical thinking (CT) as "Purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation and inference as well as explanation of the evidential conceptual, methodological, and contextual considerations upon which that judgment was based. The Delphi study reports that CT includes the dimensions of skills and dispositions. Accordingly, The ideal critical thinker is, habitually inquisitive, well-informed, honest in facing personal biases, prudent in making judgments, willing to consider, clear about issues, orderly in complex matters diligent in seeking relevant information, reasonable in selection of criteria, focused in inquiry and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit". (Chenoweth,1998; Giancarlo &Facione ,2001)

The concepts of CT and CTDs become a catchphrase among nurse educators today and increasingly important in nursing because it shapes goals in nursing education as well as practice. These concepts are considered as indicators in higher education, the Commission of Collegiate Nursing Education (CCNE) strongly indicated that the development of CT and CTDs should be the top curricular priority in baccalaureate nursing programs. (Rannoevacho ,2000 ; Cauig,2001)

The Joint Commission of Accreditation of Health Care Organizational Standards (JCAHO, 1994) reported that critical thinking is accompanied with quality improvement. Enhancing patient care is a trade mark of the nursing profession and. Surveyors from JCAHO envision that nurses do more than documentary passive observations. Nurses need to take action based on patients' conditions in such a way that management of care involves all facets; exemplify reasoned considerations, constructive thinking and incorporate a particular disposition that leads to favorable outcomes. The process of critical thinking will enhance the ability of nurses to identify clinical indicators, assess their significance and discuss areas for improvement. Both CTDs and continuous quality improvement are seen as never ending processes and outcomes. Hence, a harmonious

relationship exists between the importance of CTDs and how to promote it through a conducive learning environment and the use of educational strategies and the effective quality improvement initiatives. (Bandman & Bandman, 1995; Facione et. al, 1994; Alfaro, 2004)

There are three sets of factors that may affect students' dispositions toward critical thinking; characteristics of teachers, characteristics of learners and the educational strategies that both teachers and learners apply. Critical thinking is a desirable educational outcome; so to develop and practice CT; educators need to re-consider course content and curricular strategies used to develop CT. (Lee et. al, 2000; Girot, 2000; Seymour et.al 2003; Kawashima & Petrini, 2004)

Gilmartin(2001); Banning(2004) stated that critical thinking is a salient feature of the facilitative methods of teaching and learning. Nurse educators who teach nursing need to be familiar with and encourage the use of facilitative methods of teaching and learning, in particular creative educational strategies and the adoption of these teaching and learning approaches can encourage the use of process oriented teaching methods. This will add to the creation of a teaching and learning programme that reduces the dichotomy between professional knowledge and university knowledge.

Carroll (2007) suggested a set of criteria for assessing how well an instructional approach might be expected to teach thinking dispositions. Their view is based on the idea that thinking dispositions are learned through a process of enculturation, rather than direct transmission. Thinking dispositions are characterological in nature, and like many human character traits, they develop in response to immersion in a particular cultural milieu. The cultural milieu that best teaches thinking dispositions is a culture of thinking environment that reinforces good thinking in a variety of explicit ways. The effective program for teaching thinking dispositions, therefore, should create a culture of thinking in the educational system. Such a culture will have the following four elements.

1. It should provide models of good reasoning behavior and providing opportunities for teacher to model reasoning so, students are provided with exemplars of what thinking dispositions look like in practice.
2. The program should provide direct explanations about the purpose, concepts and educational strategies that promote CTDs.
3. A program for teaching CTDs should provide plenty of opportunities for active, reflective and collaborative learning experiences.

4. Lastly, the program should provide plenty of opportunities for formal and informal feedback around thinking dispositions through teacher feedback, peer feedback and self feedback students should learn about the strengths and weakness of their reasoning behavior. Feedback is one of the most powerful ways a culture teaches and expresses its values.

Stewart and Dempsey (2005) identified, benchmarks and guiding principles for best practices that promote CTDs; encourage contact between students and faculty, develop reciprocity and cooperation among students, uses active and reflective learning techniques, give prompt feedback, emphasize time on task, communicate expectations and learning outcomes, respect diverse talents and ways of learning. Moreover, Stewart and Dempsey (2005) identified students' independent learning and self autonomy as the most important guiding principles for promoting CTDs, they identified independent learning as a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes'. They added that educator's role as a facilitator of the learning process is very important.

So, this study aimed to determine the relationship between critical thinking dispositions of the nursing students and preferred educational strategies.

2. Material and Methods

Materials

Research design:

This research is a descriptive correlational design.

Setting:

This study was conducted at the Faculty of Nursing, University of Alexandria.

Subjects:

The subjects of this study consisted of 50% of the total number of students of each academic level comprising 630 students. First year, n=161; Second year, n=135; Third year, n=144; Forth year, n=190. Subjects were selected using the systematic random sampling method

Tools:

Tool I: California Critical Thinking Disposition Inventory (CCTDI):

The California Critical Thinking Disposition Inventory (CCTDI) (*Facione & Facione, 1992*) was used to determine students' critical thinking dispositions or habits of the mind. The CCTDI is a 75 items likert format tool, each subscale assesses one of the seven dispositions of critical thinking, namely; truth seeking (12 items), open-mindedness (12 items), analyticity (11 items), systematicity (11 items), self confidence (9 items), inquisitiveness (10 items), and cognitive maturity (10 items).

Scoring system:

For each of the seven subscales a student's score on the CCTDI may range from a minimum of 10 points to a maximum of 60 points. Scores are interpreted utilizing the following guidelines. A score of 40 points or higher indicates a positive inclination or affirmation of the characteristic; a score of 30 or less indicates opposition, disinclination toward the same characteristic. A score in the range of 31-39 points indicates ambivalence toward the characteristic.

An overall score on the CCTDI can be computed by summing the seven subscale scores. Overall CCTDI scores may range from a minimum of 70 points to a maximum of 420 points. Similar interpretative guidelines are used when looking at overall CCTDI scores: a total score of 280 points or higher indicates a positive overall disposition toward critical thinking, whereas a total score of 210 or lower indicates the negative disposition towards critical thinking. A score in the range of 211-279 indicates ambivalence toward critical thinking.

Each of the 75 items includes a forced choice six point likert scale ranging from strongly agree (1) to strongly disagree (6). A reversed scoring is allotted to negative statements.

Tool II: Preferred Educational Strategies Questionnaire Schedule (PESQS):

This tool was constructed by the researchers after reviewing the related literature *Gardner (2004)*; *Lierman (2004)* to determine the degree of preference of each strategy by every study subject. It constitutes a list of 24 educational strategies in a likert format and a simple description of each strategy. Each of the 24 educational strategies includes a forced choice 4- point likert scale that are categorized and coded as follows; always preferred (4), often preferred (3), sometimes preferred (2) and not preferred (1).

Method

- Permission to conduct the study was obtained from the dean of the Faculty of Nursing; Alexandria University and the head of each

scientific department after explaining the purpose of the study.

- California Critical Thinking Disposition Inventory (tool I) was translated into Arabic and adopted to suit the Egyptian culture by the researcher.
- Preferred Educational Strategies Questionnaire Schedule (PESQS) (tool II) was developed by the researcher after extensive review of related literature. This tool used to determine the degree of preference of each strategy by the nursing students, this part of the tool was developed in the form of structured statements that describe simply each strategy. Students were asked to tick their responses in the likert format to determine the extent of preference of each educational strategy.
- Tool I and II was submitted to a jury composed of 6 experts in the field of nursing from the faculty of nursing staff members. They were asked to judge completeness and accuracy of the content of the tools.
- Reliability of the tool I and II were tested for their internal consistency using Cronbach Alpha reliability test. The coefficient values were 0.869 and 0.726, respectively.
- Subjects were selected using the systematic random sampling method by selecting the fourth name from random lists that were previously prepared by the students' affairs department.
- Pilot study was conducted by the researcher to test the clarity and applicability of the tools on 80 students (20 students from each academic level). Tools were reconstructed and put in its final form.
- The researchers explained the purpose of the study, and then assured them that their responses would be kept confidential. Student's consent to respond to the questionnaire was obtained.
- Data was collected by the researcher, using the questionnaire method over a period of 3 months from the beginning of April to the end of June 2008.

Statistical analysis:

- Data was coded and computerized and statistical analysis was conducted using SPSS version 12.
 - Descriptive statistics were done using numbers, percentages, arithmetic means and standard deviations.
 - Analytical statistics were done using:
1. ANOVA was used to determine:-

- Significance of differences of nursing students' critical thinking dispositions in relation to their academic level.
 - Significance of differences of nursing students' critical thinking dispositions in relation to their last educational experience.
 - Significance of differences of the preferred educational strategies among the nursing students of the four academic levels.
 - Relationship between critical thinking dispositions and preferred educational strategies among the nursing students.
 - The selected level of significance was $p \leq 0.05$.
2. Cronbach Alpha reliability test; to test the internal consistency of tool I and II.

3. Results

Table (1): illustrates personal and academic characteristics of the nursing students; it can be noticed that nearly one third of the students (30.1%) were in the fourth year, about one quarter (25.6%) were in the first year, while less than one quarter (22.9%) and (21.4%) were in the third and second year respectively. The majority of the students (78.1%) were females, while males constituted 21.9%.

Figure (1): shows that nursing students regardless of their academic level showed ambivalent disposition toward the total score of critical thinking dispositions and all critical thinking dispositions subscales (CTDs) except for the inquisitiveness disposition which had the positive level (42.49±6.557).

Moreover, the highest mean score was among students of the four academic levels (N=630) in the inquisitiveness disposition followed by the analyticity disposition (42.49±6.557, 39.61±5.379), respectively. Meanwhile, they got the lowest mean scores in the truth seeking and open mindedness dispositions (32.20±5.968, 35.28±5.068), respectively. Also, findings indicated also, that students of the first year got ambivalent level regarding all CTDs except for analyticity and inquisitiveness dispositions which were in the positive level (40.19±7.25, 40.88±6.55) respectively.

Results indicated the following in relation to the CTDs of the students according to their academic levels; regarding truth seeking and open mindedness subscales; it can be noticed that the highest mean scores were among the first year students (33.34±5.56 and 37.12±5.77) respectively and the differences were statistically significant (F= 6.90 and 15.57) respectively.

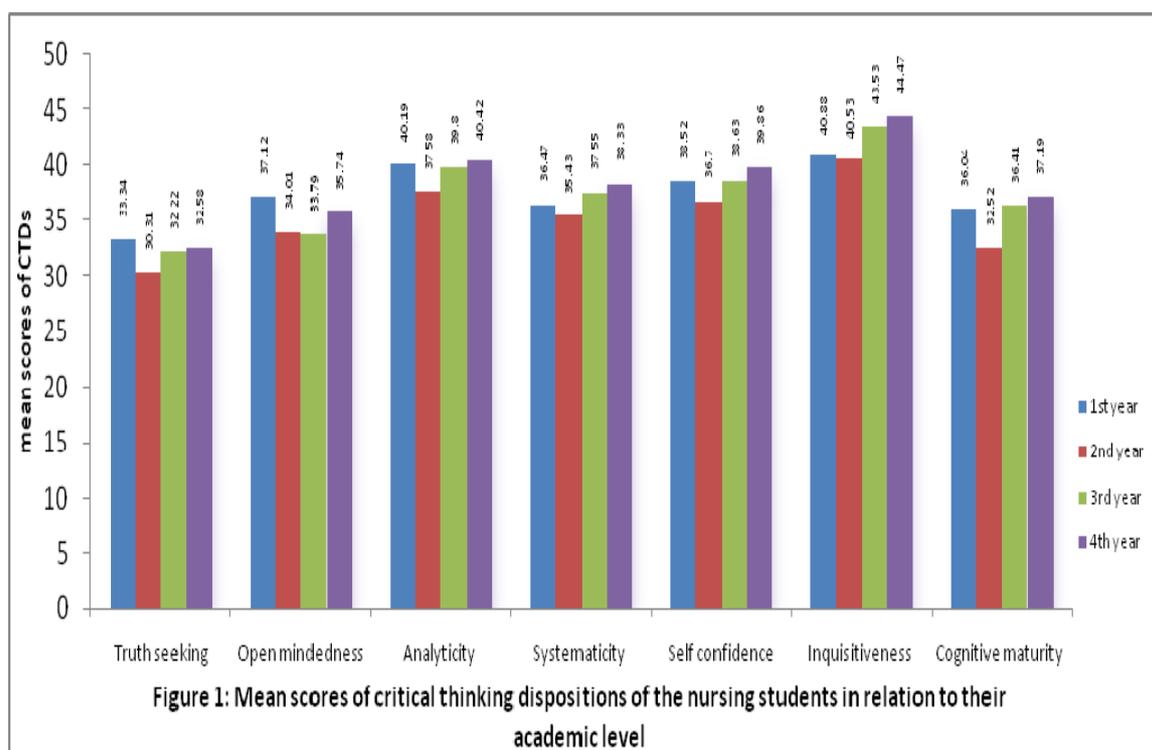
Concerning Analyticity, Systematicity, Self confidence, Inquisitiveness, Cognitive maturity subscales and the Total score of critical thinking dispositions; it can be noticed that the highest mean scores were among the fourth year students (40.42±5.63, 38.33±5.46, 39.86±5.72, 44.47±6.78, 37.19±6.88, 268.23±25.81) respectively and the differences were statistically significant (F= 8.86, 9.36, 7.91, 15.26, 14.86, 22.90) respectively and $P=0.000$ for all values.

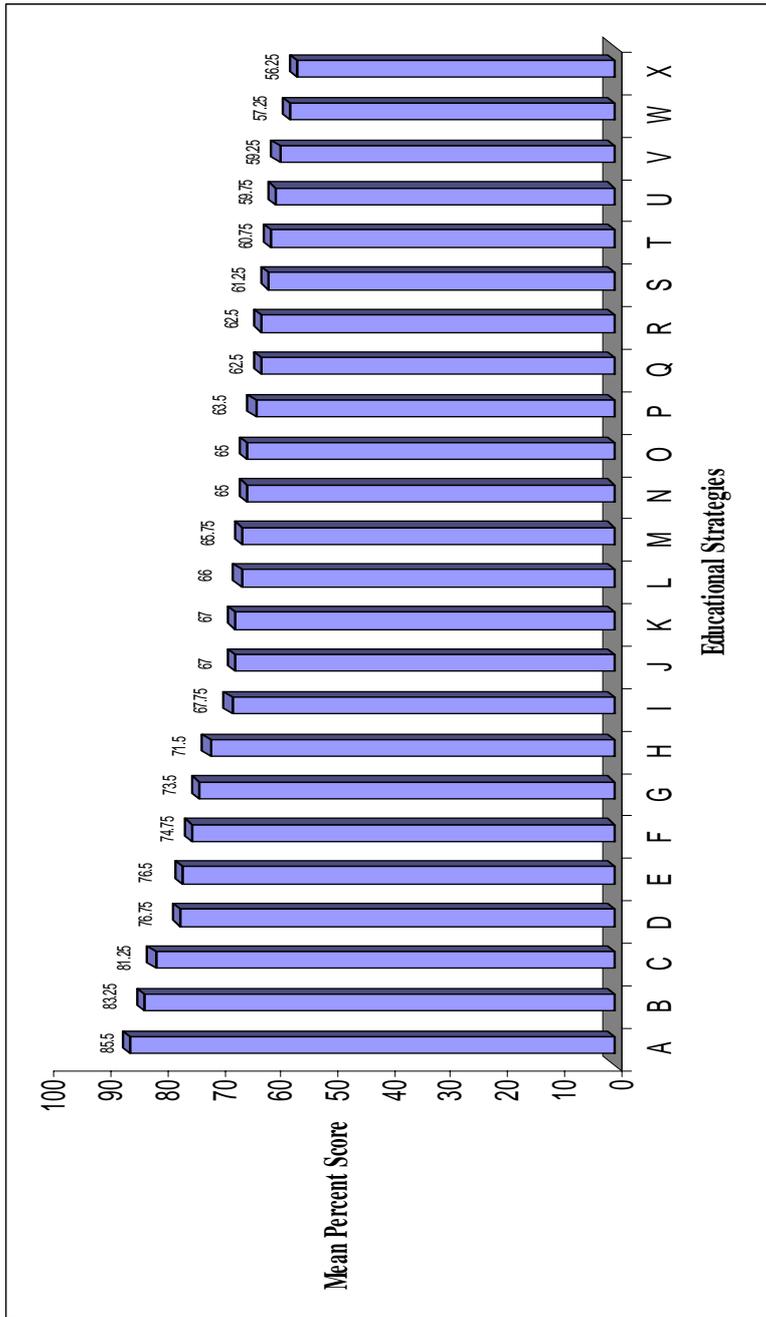
Figure (2): Presents ranking of the mean percent scores of the total nursing students' preference for each educational strategy as follows: pre clinical conference ($\bar{X} \% = 85.5\%$), nursing round ($\bar{X} \% = 83.25\%$), post clinical conference ($\bar{X} \% = 81.25\%$), mentoring ($\bar{X} \% = 76.75\%$), problem based learning ($\bar{X} \% = 76.5\%$), demonstration ($\bar{X} \% = 74.75\%$), computer assisted instruction/e-learning ($\bar{X} \% = 73.5$), learning contract ($\bar{X} \% = 71.5$), questioning ($\bar{X} \% = 67.75$), case study ($\bar{X} \% = 67$), role play ($\bar{X} \% = 67$), interactive lecture ($\bar{X} \% = 66$), seminar ($\bar{X} \% = 65.75$), debate ($\bar{X} \% = 65$), panel discussion ($\bar{X} \% = 65$), portfolio ($\bar{X} \% = 63.5$), cooperative learning ($\bar{X} \% = 62.5$), role modeling ($\bar{X} \% = 62.5$), written assignments ($\bar{X} \% = 61.25$), brain storming ($\bar{X} \% = 60.75$), concept map ($\bar{X} \% = 59.75$), reflective journal ($\bar{X} \% = 59.25$), project based learning ($\bar{X} \% = 57.25$) and traditional lecture ($\bar{X} \% = 56.25$).

Figure (3) illustrates presents mean total scores of CTDS of the nursing students as they significantly relate to the preferred educational strategies. The students' total score of critical thinking dispositions had significant relation with nine preferred educational strategies out of twenty four. They strongly preferred the following educational strategies: role play, demonstration, portfolio computer assisted instruction/e-learning and panel discussion. While they moderately preferred the following educational strategies: interactive lecture, case study, questioning and nursing round. Finally, they never preferred written assignment. F value ranged between 4.36 and 14.55 and p value ranged between 0.00 and 0.01. On the other hand, There was no statistical significant relationship between the students' total score of critical thinking dispositions and their preference to written assignment

Table1: Personal and Academic Characteristics of the Nursing Students

Characteristics of Nursing Students	N N = 630	%
Academic level		
First year	161	25.6
Second year	135	21.4
Third year	144	22.9
Forth year	190	30.1
Last Educational Certificate		
Secondary	432	68.57
Technical Health Institute Nursing Diploma	128	20.32
Technical Nursing Institute Diploma	61	9.68
BSc	9	1.43
Gender		
Male	138	21.9
Female	492	78.1
Age		
17-	165	26.2
19-	292	46.3
21-23	173	27.5





A=Pre Clinical Conference, B=Nursing Round, C=Post Clinical Conference, D= Mentoring, E= Problem Based Learning, F=Demonstration, G=Computer Assisted Instruction/E-Learning, H= Learning Contract, I= Questioning, J=Case study, K=role play, L=Interactive Lecture, M=Seminar, N=Debate, O=Panel Discussion, P=Portfolio, Q=Cooperative Learning, R=Role Modeling, S=Written Assignments, T=Brain Storming, U=Concept Map, V=Reflective Journal, W=Project Based Learning And X=Traditional Lecture.

Fig. 2: Ranking of the Mean Percent Scores of the Total Nursing Students' Preference for Each Educational Strategy

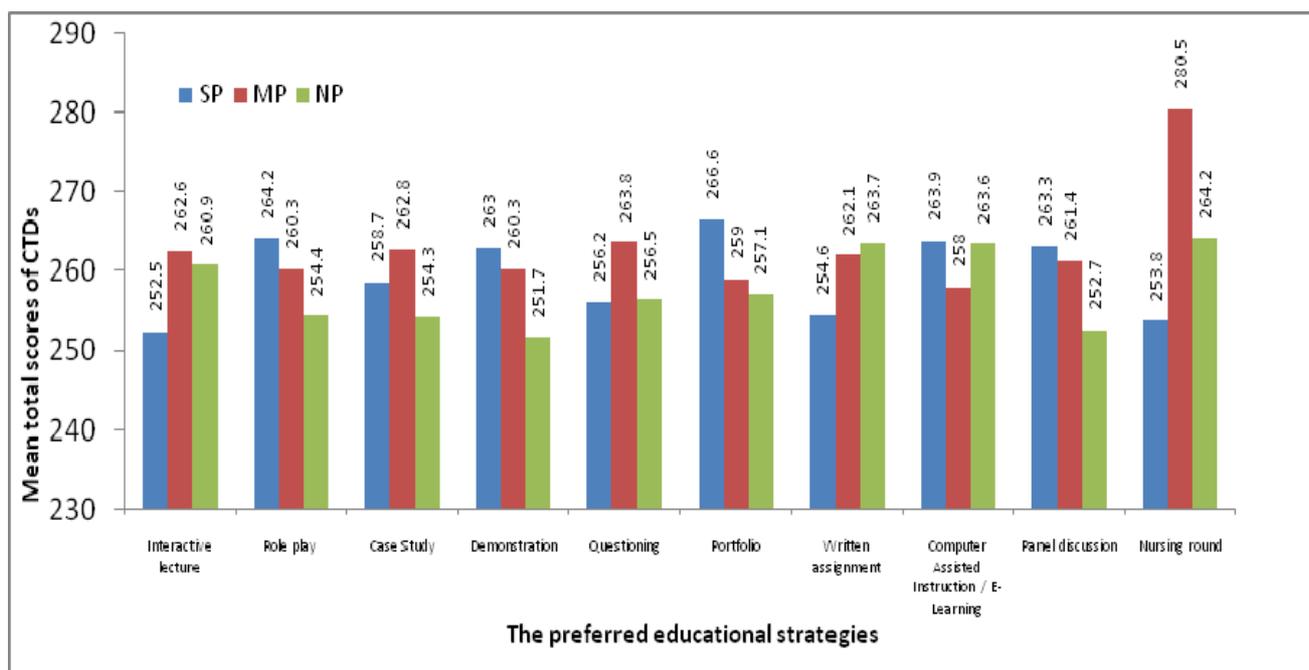


Figure 3: Mean scores of CTDs Of nursing students as they significantly relate to preferred educational strategies

4. Discussion

Nurse educators have the challenge of providing students with an education that prepares them for the future marketplace. Critical thinking is a valued educational outcome. Therefore, nurse educators agree that critical thinking is an integral component and essential competency for the professional nurse in today's ever changing health care environment.

Gardner (2004) identified that the education of good critical thinkers includes the fostering of critical thinking dispositions (CTDs), these dispositions are described as the consistent internal motivation to problem solving and decision making by using thinking.

The results revealed that the nursing students mean scores were high in analyticity and inquisitiveness, compared to truth seeking and open mindedness; these findings are consistent with (McCarthy ,2001; El Hessewi,2003). These indicate that the nursing students have the disposition of being alert to potentially problematic situations, anticipating possible results or consequences, prizing the application of reasons and the use of evidence if

the problem in hand turns out to be challenge or difficult.

Interestingly, the results showed also, that the nursing students mean scores were positive in inquisitiveness, which refers to the person's intellectual curiosity and desire for learning. The inquisitive person is eager to learn more, he/she is one who wants to know how things work and values learning even if the immediate pay off are not directly evident. These results were supported by Redding ,1999) who considered up-to-date knowledge as an important component of critical thinking .The nursing students curiosity to broaden their knowledge base become a must when evidence based practice based on standards is applied. Another reason that motivates the nursing students to look for knowledge and to strengthen their scientific base is their intense need to improve their image in the health care field as the knowledge base provides the students with sense of empowerment.

Regarding the CTDs of the nursing students in relation to their academic level; as, regards truth seeking which is the courageous desire for the best

knowledge even if such knowledge fails to support or determine one's preconceptions, beliefs or self interest. The mean score of this dispositional characteristic was the highest among the fourth year students. This finding is consistent with the finding of (Lee et al. ,2006) in their study to examine critical thinking disposition in baccalaureate nursing students.

Findings of this study was supported by those of (McCarthy et al.,1999; Bartlett & Cox ,2000, Tiwari et al. ,2003; Profetts-McGrowth ,2005;Shin et al. ,2006), these findings revealed that seniors got the significantly highest mean of the overall CCTDI. In contrast, findings of (El Hessewi, 2003 ; Brunt. 2005; Ward ,2006), where the senior level students got the lowest mean of total score of CTDs.

In relation to, the relationship between critical thinking dispositions (CTDs) and preferred educational strategies among the nursing students; numerous components of critical thinking (CT) are involved in the development of valued educational strategies. Educational strategies that promote CTDs are never simple and require careful planning. They entail highly complex performances of observation and analysis, reading and interpretation, question and answer, conjecture and refutation, proposal and response, problem and hypothesis, query and evidence, individual retention and deliberation...these educational strategies command student vigilance which in turn causes learners to feel highly visible in the educational environment and students become active, reflective, interactive and independent. Learners also are accountable not only to teachers but also to their peers in their responses, arguments, commentaries and presentation, they are also accountable to themselves through their self reflection. (Shulman, 2005)

As for the interactive lecture; findings revealed that there were significant relationships between the nursing students' total score of CTDs and the nursing students' preference of the interactive lecture. (Oerman ,2000), clarified that the interactive approach during the lecturing method encourages students' CTDs, he explained that, during the interactive lecture a combination of educational methods are used according to the nature of the topic being introduced; discussion, questioning, short case analysis, concept map, story based discussion, and book end approach.

As regards role play, case study and demonstration, as a simulation educational strategies; the results showed that there were significant relationship between the total score of CTDs. (Welthew (2004), identified role play, case study and demonstration as the most important types of simulation used to educate nursing students. (Linden

(2008) in her study of "the effect of clinical simulation and traditional teaching versus traditional teaching alone on critical thinking of nursing students" explained that simulation meets the standards for interactive, student – centered learning that stimulates CTDs. Moreover this strategy has been prescribed in nursing education as part of the education redesign.

Moreover, (Amerson ,2005; Samuel ,2006) explained that during interactive lectures, students are required to actively engage in the learning process, a great opportunity is allowed for students to discuss with each others and to explore alternate perspectives and examine different decisions to arrive at reasoned judgments. So, possessing open mindedness is a command for these interactions and collaborations.

The results revealed that there were significant relationships between the total score of CTDs, and their preference of the questioning strategy. On this track of usefulness of the questioning technique , Webber et al. (2002) stated that, nursing education builds on information from courses with proven methods that espouse learning (such as questioning and other interactive techniques which encourage the adult learner). Memorizing facts is not critical thinking, however, taking information into a global perspective by analyzing and evaluating the data, gives insight as to the nature of the problem/question that will then evoke a solution / answer.

The results showed that there were significant relationship between the nursing students' total score of CTDs and their preference of portfolio. These results are supported by Grant et al. (2007) who stated that portfolio enable students to gather evidence of learning via a series of tasks and the information documented arises from learner's learning experience, such students follow the reasons and evidences are truth seekers. Furthermore, Driessen & Vermunt (2003) ,clarified that the component tasks of the portfolio should be organized to meet intended learning outcomes. Students tend to use their systematic thinking in order to accomplish their tasks in the required manner. Through portfolio, the future developmental needs can be identified and organized. Tiwari et al. (2003) ; Ghallab (2008) opinions supports the relationship between analyticity and open-mindedness and portfolio. The work controlled in the portfolio provides material for the student to review their learning. It also, provides full picture on how students analyze, produce, and create. In addition, students interact on intellectual emotional and social levels with others, they listen to each other, ask their peers about their opinions in their work. Another benefit for the portfolio is raising students self confidence because it measures students progress in their accumulated work.

As for computer assisted instruction (CAI)/e- learning; the results presented significant relationships between the nursing students' open-mindedness and analyticity and their preference of this strategy. Meyer (2003) ; Ahmed (2008) stated that " as faculty members struggle to determine how to use new technologies in education appropriately; they must grapple with understanding the advantages of online or computer assisted activities. Curtis & Lawson (2001) found evidence from the literature on successful collaborative learning in online discussions. They reported in their study that, students experienced greater cognitive and explanatory learning.

The results presented that there were significant relationships between the nursing students' total score of CTDs and their preference of nursing round. These results are reasonable, Elliot and Waldock (2008) in their study "round: an approach to nursing development" reported that successful round should constitute of three basic constituents; engagement, team building and knowledge appreciation.

Furthermore, Morsy (2004) stated that nursing round demands students to possess analyticity in order to analyze the patient condition and systematicity in order to organize the communication or intervention according to the purpose of the round.

Finally, there was no statistically significant relationship between total score of CTDs and written assignment. That results explained by Fazarro et.al (2009) that the written assignments in enthusiastic design in the clinical nursing experience must be considered as nursing students spend prolonged hours in the practical sits practicing psychomotor skills and attending lecture classes and participating in seminars and clinical conferences, so after completing the schools day they become very exhausted.

From that context CTDs is a desired educational outcome; so to develop and practice CT, educators need to reconsider educational strategies that had significant relationship with the students CTDs and are in accordance with their preferences. Nurse educators need to be familiar with and encourage the use of facilitative methods of teaching and learning that not only prepare the nursing students with the substantive knowledge necessary for competent practice but also, create an environment in which students learn to think critically, practice reflectively, learn independently, work effectively in groups and access and use new information to support their practice that will in turn decrease the dichotomy between professional knowledge and university knowledge. However, such a shift in what has been traditionally revered in

nursing education creates tensions and challenges such as: students' resistance to new methods, classroom straight and role confusion, here the role of faculty arises to overcome these difficulties. In this respect the Faculty of Nursing – Alexandria University considered promoting students CT as one of the most important strategic objectives to be a unique privilege for joining the Faculty.

5. Conclusion and Recommendations

The following are the conclusions derived from findings of the present study:

The CTDs of the nursing students as arranged in descending orders are: inquisitiveness, analyticity, self confidence, systematicity, cognitive maturity, open mindedness and truth seeking.

The nursing students' total score of critical thinking dispositions had significant relation with nine of the preferred educational strategies out of the twenty four; the students strongly preferred the following educational strategies: role play, portfolio, computer assisted instruction/e- learning , panel discussion. While they moderately preferred the following educational strategies: interactive lecture, questioning case study and nursing round. Finally, they never preferred written assignment.

Based on the findings of the present study, it is recommended that; annual assessment of students' CTDs using the CCTDI is carried to select educational strategies that reinforce the positive dispositions and change the negative and ambivalent ones towards the positive inclination. Also, longitudinal study that evaluates students' critical thinking dispositions throughout the four years of the nursing program to determine the developmental process of CTDs.

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