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Enhancement of critical thinking in curriculum design and delivery: A randomized controlled trial for educators

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Abstract

Critical thinking is an important outcome criterion of higher education in any discipline including nursing. If nursing programs envisaged preparing graduates who are equipped with critical thinking, then the educators who plan and deliver the programs must exhibit higher level thinking in their teaching practices. This paper presents finding of the 1st phase of a National level research study that aims to assess, develop and enhance educators' critical thinking capacity.

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Keywords: Critical thinking; Pakistan; curriculum delivery; higher education; BScN Program.

1. Introduction

Critical thinking (CT) is considered a fundamental cognitive process for knowledge development and utilization; and it is applicable to problem solving and decision making in any context whether it is social, clinical, ethical, managerial, or political (Simpson & Courtney, 2002). Since CT is useful in analyzing complex data, evaluating situations and actions, and implementing the most appropriate actions; it is a requirement for effective problem-solving and decision-making in all walks of life. In view of these characteristics, enhancement of CT is regarded as a valuable outcome for any program in higher education including nursing (Ku, 2009; Maudsley & Strivens, 2000; Mundy & Denham, 2008; Profetto –McGrath, 2005; Spencer, 2008; Staib, 2003). Therefore, most academic departments in higher education expect their faculty to incorporate teaching and learning and assessment strategies that promote CT skills (Brookfield, 1987; Biggs, 1999).

Developing the ability to think critically is influenced by many factors, including the learning environment and the instructor's competence and approach to teaching (Simpson & Courtney, 2002). And, above all, educators must recognize the value of CT and be prepared to promote it. For teachers to prepare students with higher level cognitive thinking, "they must first emulate higher level thinking in their instructional practices" (Ball & Garton, 2005, p. 59). Facione and Facione (1996) emphasize that CT needs to be demonstrated, and that demands constant metacognitive

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reflection on “what one is doing and why” (p. 133). Thus, the educators’ role modeling and mentoring are necessary to promote CT. Contrary to the required teaching practices, didactic teaching and rote learning are still prevalent in most teaching institutions and disciplines in Pakistan, and nursing education is no exception (Davies & Iqbal, 1997; Kamal, 1999; Khalid & Khan, 2006). The entitled study is underway to develop and enhance CT skills of nurse and non-nurse educators who teach in a Bachelor of Science in Nursing (BScN) program at nursing schools/colleges in Pakistan. This paper reports findings from an assessment phase of the study.

2. Literature Review

Numerous authors have underscored the significance of CT for nurses (Brooks & Shepherd, 1990; del Bueno, 1992; Ford & Profetto-McGrath, 1994; Miller & Malcolm, 1990). . Since CT is considered to be a fundamental competency required of nurses; most undergraduate programs in nursing identify CT as one of their required educational outcomes (Boland, 2005; Daly, 1998; Profetto-McGrath et al., 2004).

The teaching and measurement of CT is a continuous challenge for educators and researchers, especially because there is no single definition of CT. Although there is no one right way to teach or assess CT; literature reveals that teaching strategies that actively engage students in their learning process and foster a CT disposition (self-confidence, inquiry, analytical abilities, reasoning, and open-mindedness) can be useful to infuse CT as a habit of the mind. Teaching strategies such as reflections, questioning and self-directed learning, which ask for active engagement of students in their learning, are proven to be effective in developing and promoting CT skills and dispositions (Angel, Duffey, & Belyea, 2000; Beeken et al., 1997; Chenoweth, 1998; Colucciello, 1997; Cravener, 1997; Di Vito-Thomas, 2000; Elliot, 1996; Rossignol, 1997; Schell, 1998).

Active learning requires students to think about what they are doing (Van Amburgh, Devlin, Kirwin, Qualters, 2007). Empirical evidence suggests that both cognitive and non-cognitive factors (social and physical) influence the learning environment, and consequently the students’ thinking (Gloria, Castellanos, & Orozco, 2005). Fitz Patrick, Wenyi, and Younghoon (2000) describe a learning environment as the milieu where students experience learning by being involved in authentic activities that are pertinent to a certain profession. Although the physical environment of the classroom is less important than its social environment for students’ learning, they are interlinked because the physical environment can affect students’ thinking directly and indirectly. Physical characteristics such as class size, noise level, seating arrangement, room temperature, and distance between students and faculty could impact the social interaction among them. Likewise, some of these factors such as comfort and noise level can directly affect the individuals’ thinking and concentration ability.

Clasen and Bonk (1990) posited that although there are many strategies that can impact student thinking, it is the teacher’s questioning skills that have the greatest impact; the level of student thinking is directly proportional to the level of questions asked. Research studies suggest that many teachers use factual and lower level questioning which does not promote CT (Craig & Page, 1981; Giddins et al., 2000; Nicholl & Tracey, 2007; Profetto-McGrath et al., 2004; Sellappah, Hussey, Blackmore, & McMurray, 1998). Lower level questioning related to recall of information or comprehension is important to facilitate the teaching and learning process but to foster CT, nurse educators are required to develop skills for asking higher level questioning that involves analysis, synthesis, and evaluation (Profetto-McGrath et al., 2004).

The limited research in the Pakistani context reveals that didactic teaching and rote learning are still prevalent in most teaching institutions and disciplines. In their study of teachers’ education in Pakistan, Davies and Iqbal (1997) reported that the majority of teaching was lecture based, notes were dictated to students. Some students did not take any notes, but just listened to the lectures and then used the text books to prepare for examinations. Similarly, in 1998, a nation wide study, involving 17 schools of nursing in the public and private sectors in Pakistan, was conducted to evaluate the implementation of the revised curriculum for a diploma in general nursing. This study clearly indicated that nursing students were not encouraged to think and question. This was reflected in a comment made by a student: “If we say, ‘I have not understood’, I am told, ‘No need to understand, just remember it (Kamal, 1999).

In their study of assessing the critical thinking skills of faculty, Zygmunt and Schaeffer (2006) concluded that although it is a primary responsibility of the educators to develop CT of their students, educators find it challenging if they have not learnt CT in their educational system and training. This appears to be the same in Pakistan as well. Moreover, considering the socio-cultural dimension of CT the Pakistani learners may be viewed as members of a culture that does not encourage questioning people who by virtue of their age or position, are in authority.

3. Methods

3.1 Study Design

Using an experimental design with a pre and post test approach, the entire study consists of three phases: assessment, interventions, and post assessment. As noted earlier, this paper is limited to the assessment phase.

3.2 Population and Sample

The study population comprised all faculty members who teach nursing students in BScN programs in nursing schools/colleges in Pakistan. At the time of proposal development for this study, a total of 16 nursing schools and colleges were offering BScN programs in Pakistan. Following the inclusion criteria a total of 86 full-time nurse or non-nurse educators, who were teaching in the BScN programs, were recruited for the study.

3.3 Data Collection

With the approval of the institutional review board, permission was sought from the head of each school /college to access their faculty members. With an informed consent, each faculty member was asked to provide a course grid which they had either developed or used for teaching. Moreover, delivery of their teaching session was observed for 45-60 minutes. A structured checklist was used to assess the learning environment and pedagogical skills of the teachers. The teachers' questioning skills were observed and tape recorded. To substantiate data through these methods, field notes were also taken during the teaching sessions. Demographic information of each participant faculty was obtained from them.

3.4 Data Analysis

The recorded data on teachers' questions was transcribed verbatim. Using the Bloom's Taxonomy for cognitive thinking, the teachers' questions were categorized and coded for six levels of high and low order thinking. Data from the observation checklists were coded and entered into the software of statistical package for the social sciences (SPSS) to conduct analysis through descriptive statistics.

4. Results

4.1 Participants' Demographics

Of the 16 educational institutions in public and private sectors, 86 educators from 14 nursing schools/colleges opted to participate in this study. Of that, 66.2% were females and 33.8% were male. Majority of the participants (19.4%) were nurse educators; most of whom (77.5%) had completed a BScN degree (see Table 1). The participants' age ranged from 24 to 55 years; the majority of them (52.9%) were 31 to 40 years old while their teaching experience ranged from a few months to 16 years (see Table 2).

Table 1. Distribution of Sample by Professional Qualifications

Professional Qualifications	Percentage
MScN/MPH	8.4 %
BScN (4-years/post RN)	77.5 %
Diploma in Nursing with a diploma in Teaching	8.3 %
Others - (Med, MPhil.)	8.6 %
Total	100%

Table 2. Distribution of Sample by Age and Teaching Experience

Age in Years	Percentage	Experience in years	Percentage
Up to 25	4.4 %	< 1	13.3 %
26-30	32.4%	1-1.5	19.1 %
31-40	52.9 %	2- 4	30.9 %
41-50	8.8 %	5-10	24.9 %
>50	1.5%	11-16	11.8 %
Total	100%	Total	100 %

4.2 The Learning Environment

As shown in Table 3, the size of the classes ranged from 7 to 60 students. In terms of the learning environment (Table 4), nearly 48 % of the classrooms had an excellent physical environment and were very conducive for learning while the rest of them were either not conducive (4.2%) or partially conducive (47.9%). Various factors such as a large number of students seated in a limited physical space, lack of electricity, or high level of noise due to ceiling fans or other students walking and talking outside the classroom led to these ratings. In a few observations, students were standing in the classrooms due to a shortage of chairs or they were unable to see the Overhead Projector/ Overhead Transparency (OHP/OHT) screen properly. The level of educators' social skills (facilitation, respect, responsiveness, and encouragement to students) also varied (items 2-5 in Table 3). Most of the teaching was lectured based and used either OHP or multi-media. Although the majority of the educators (82.6%) did not dictate notes to students, 8.7% did do so to some or a great extent. Likewise, in nearly 38% of the classes observed, students were not involved in taking notes, but in the rest of the sessions they were engaged in taking notes to some extent (42%) or to a great extent (18.8%).

Table 3. Number of Students in the class

Class Size	Percentage	Class Size	Percentage
≤10	07.2 %	31-40	17.4 %
11-20	23.2 %	41-50	14.5 %
21-30	26.1 %	>50	11.6 %

Table 4. Observations of the Learning Environment

Attributes of learning Environment	Not at all	To some extent	To great extent	Not applicable
1. Physical environment is conduciveness for learning	4.2 %	47.9 %	47.9 %	-
2. The instructor facilitates teacher-student interaction	1.5 %	42.0 %	56.5 %	-
3. The instructor demonstrates an attitude of mutual respect	-	31.9 %	68.1%	-
4. The instructor encourages students if they asked question	-	43.5 %	52.2 %	4.3 %
5. The instructor is responsive to student's concerns	-	47.8 %	43.5 %	8.7 %
6. The instructor dictates notes	82.6 %	8.7 %	8.7 %	-
7. Students are taking notes during the session	37.7 %	42.0 %	18.8 %	1.4 %

Table 5. Cognitive Levels of Questioning asked by Educators

Types of questions	Cognitive Level	Number of Questions	Percentage
Knowledge	Low	62	21.20 %
Comprehension	Low	65	22.30 %
Application	Low	41	14.04 %
Analysis	High	42	14.38 %
Synthesis	High	20	6.84 %
Evaluation	High	13	4.45 %
Vague		27	9.24 %
Others	(rhetoric, affective or probing questions)	22	7.53 %
Total		292	100 %

4.3 The Educators Questioning Skills

As summarized in Table 5, the educators asked more low level questions than high level questions. Most of the low level questions were to check the students' comprehension and knowledge (22.3% & 21.2% respectively), followed by inquiring their ability to apply the learned knowledge. Within the high level questions, more questions (14.38%) were of the analysis type than evaluation and synthesis. In addition, 9.24 % of the questions were vague while 7.53% of questions were rhetorical, affective or probing in nature. Moreover, field notes of the researchers' observations indicated that some teachers posed questions and immediately answered them instead of waiting for students to think and respond. In addition, some teachers asked a question that was written on a power point slide; however, the answer to the question was also noted on the same slide.

5. Discussion and Conclusion

The findings of the assessment phase of the study reveal that the majority of nurse educators are BScN graduates; this is unlike the developed countries which require a graduate degree to teach in a BScN Program. Observations about the learning environment of classrooms showed great variations and indicate the need for improvement. The physical environment of the class rooms requires attention to facilitate students' concentration and better thinking. Although not tested at this point, the variations in teachers' social skills may be related to their years of teaching experience which was <2 years for nearly 1/3 (32.4%) of the participants in this study. Similar to Davies and Iqbal's (1997) study, most teaching was lecture based, but the issue of dictating notes was less prevalent. Although at times ineffective, many of the educators in this study used a power point presentation instead of using a white or black board while some educators used multiple strategies.

In terms of teachers questioning skills, educators made efforts to ask questions; however, many of them used the questioning strategy ineffectively because they did not provide opportunity for students to think and respond, but instead provided the answers. Findings also indicate that the educators in this study asked more low level questions than high level questions which is similar to the findings of other studies about educators' questioning skills (Craig & Page, 1981; Nicholl & Tracey, 2007; Profetto-McGrath et al., 2004; Sellappah et al., 1998). However, unlike the findings of Profetto-McGrath et al. (2004) and Sellappah et al. (1998) findings, the percentages of vague questions were considerably high in this study which could be related to the educators' command of the English language.

In conclusion, the findings of this study indicate that the learning environment of classroom teaching in BScN programs in Pakistan is not always conducive to promoting critical thinking. Although there was some evidence that educators wished to inculcate critical thinking in their students, very little thought was given in their planning and delivery of the content that would foster critical thinking skills.

6. Recommendations

- To achieve the true goal of higher education, educators must have the knowledge and skills to integrate critical thinking in the development and delivery of the curriculum.
- Faculty members must be educated to develop their own critical thinking skills before they are expected to impart critical thinking to their students. While the new generation of faculty members may have access to learn critical thinking in their formal educational programs, others must be educated via faculty development programs.

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