Critical Thinking in Nursing and Learning Styles

Belgin YILDIRIM

PhD, RN, Research assistant, Aydın School of Health, Adnan Menderes University, Aydın, Turkey

Şükran ÖZKAHRAMAN

PhD RN, Assistant Professor, Faculty of Health Science, Süleyman Demirel University, Isparta, Turkey

Abstract

It is possible for any researcher to come across with numerous definitions of critical thinking. "Critical thinking is a composite of attitudes, knowledge and skills that include:Attitudes of enquiry that involve an ability to recognise the existence of problems and an acceptance of the general need for evidence of the nature of valid abstractions, and generalisations in which the weight or accuracy of different kinds of evidence is logically determined; Skills in employing and applying the above attitudes and knowledge". Nursing education has recently placed increasing emphasis on critical thinking as a response to the need for independent learning styles in the clinical setting. Nursing educators have called for a change in nursing curricula and teching methods and learning styles to provide fort he development of critical thinking skills. Learning styles are the way individuals concentrate on, absorb, and retain new or different information or skills.

Key Words: Critical Thinking, Critical Thinking in Nursing, Learning Styles

CRITICAL THINKING

The critical thinking movement in the United States began in the early 1980s. This is due in part to a graduation requirement instituted in the California system of higher education. Since the early 1980s, there has been a proliferation of material on critical thinking. The main authors in the field of critical thinking generally agree on its core definition. However, they differ in regards to the generalizability of critical thinking. Critical thinking is also identified by different names. Creative thinking, critical spirit, critical attitude, problem solving, problem-based learning, reflective thinking and judgment are just a few examples. Although critical thinking as a concept developed rapidly during the 1980s, it continues to be a crucial concept today, and its very beginnings can be traced back to Socrates and Aristotle. Paul (1985) states that 2,400 years ago Socrates "discovered a probing method of questioning that many of the authorities of his day could not justify on rational grounds their confident claim to knowledge". Meyers (1986) traces the development of critical thinking abilities to Plato's Academy. He further states that Aristotle's *Logic* and principles of rhetoric were essential for a professional education. Thus, various forms of argument, syllogisms, and prepositional reasoning were necessary to produce graduates with keen thinking abilities.

Had humankind adhered to this view of thinking and reasoning the emphasis on critical thinking and the attainment of these skills in school would be different today. However, the founders of the United States stifled any form of critical thinking very early. For example, in 1671, Virginia's royal governor Sir William Berkeley said with pride "... there are no free schools, nor printing in Virginia, for learning has brought disobedience, and heresy ... into the world, and printing has divulged them... God keep us from both!" (Paul, 1985). This belief combined with rote memorization and recitation characteristic of the colonial period, hardly encouraged an atmosphere of critical thinking. Had the colonial schools been influenced by the writings of St. Augustine, St. Thomas Aquinas, Rene Descartes, and Immanuel Kant, there may have been more emphasis on the attainment of critical thinking skills (Paul, 1985). As America grew, and after the two periods of Enlightenment, education began to expand. The main reason for this expansion was the increased use of machinery, increasing cultural diversity with more non-Anglo-Saxon immigrants, and the rapid expansion of technology (Paul, 1985). This educational expansion continued to focus on memorization and repetition, even in higher education. Higher education graduates went into farming, business, medicine, law, or the clergy. "Their 'civic' education was not fundamentally liberal but nationalistic, not fundamentally emancipatory but provincial" (Paul, 1985).

In 1933 John Dewey wrote a landmark book on reflective thinking entitled, *How We Think.* In the book Dewey began to shape and define critical thinking. Some view this book as the early stirring of the paradigm shift in education.

Dewey defined reflective thinking as "the kind of thinking that consists in turning a subject over in the mind and giving it serious and consecutive consideration" (Dewey, 1933). In the late 1980s, the building momentum to list critical thinking as a core educational outcome provoked the National Governor's Association to incorporate critical thinking as a recommendation for national educational goals (Facione, 1995). This reform agenda has been incorporated into the Department of Education's "National Education Goals for the Year 2000". Central to the achievement of this goal is the explicit objective to assess the ability of college graduates to think critically, to communicate effectively, and to solve problems (NLN, 1997).There are several major authors who have contributed to the growing body of literature on critical thinking: John McPeck, Robert Ennis, Richard Paul, and Peter Facione. All of these authors have their own definition of what critical thinking is and these definitions are very similar. These authors differ in how they see critical thinking being taught. Some state it is subject specific and others see it as generalizable. Each author's view of critical thinking will be reviewed. These some authors definitions followings:

McPeck (1981) "Critical thinking involves a certain scepticism, or suspension of assent, towards a given statement, established norm or mode of doing things. This scepticism might ultimately give way to acceptance, but it does not take truth for granted. Instead, it considers alternative hypotheses and possibilities". Enis (1985) thought critical thinking was rational reflective thinking concerned with what to do or believe. Paul (1992) stated that critical thinking is the art of thinking about thinking while you are thinking so as to make your thinking more clear, precise, accurate, relevant, consistent, and fair. It is the art of constructive criticism; the art of identifying and removing bias, prejudice, and one-sidedness of thought; the art of self-directed, in depth, rational learning; and thinking that rationally certifies what we know and makes clear where in are ignorant.

Facione's (2006) definition of and approach to critical thinking offers a core of critical thinking skills that includes analysis, interpretation, inference, explanation, evaluation, and self-regulation. Interpretation occurs when the individual comprehends the meaning of a variety of experiences, and includes categorizing, decoding, clarifying, recognizing a problem without bias, and distinguishing the main idea from subordinate ideas. Analysis is when the learner identifies the intended and inferential relationships among statements, and includes the examination of ideas, the analysis of arguments and the ability to examine alternative approaches to a problem and identify any unstated assumptions. Evaluation includes the learner's ability to consider the credibility of assumptions and to compare strengths and weaknesses of alternative views or beliefs. Inference refers to a person's ability to construct meaning and to identify the implications of a particular position.

Yıldırım (2011), critical thinking is "the process of searching, obtaining, evaluating, analyzing, synthesizing and conceptualizing information as a guide for developing one's thinking with self-awareness, and the ability to use this information by adding creativity and taking risks".

Critical Thinking in the Health Professions

Critical thinking is of specific interest in the nursing profession. The National League for Nursing's (NLN) accreditation process requires documentation of critical thinking as an outcome. This outcome reflects the students' skill in reasoning, analysis, research, or decision making relevant to the discipline of nursing. The NLN proved to be a fore-runner of the national agenda when they required the demonstration of critical thinking in nursing graduates (Facione, 1995). The American Association of Colleges of Nursing (AACN) agrees with the NLN by stating "the diversity and complexity of nursing practice make it necessary to prepare nurses who can think critically and creatively, and who have a sound education in nursing, science, and the humanities" (Schank. 1990).

Koch-Parrish (1992) investigated the perception of baccalaureate nursing faculty and baccalaureate students regarding the definition of critical thinking. Toth (1996) utilized an experimental approach to examine the effectiveness of various instructional strategies on developing critical thinking abilities in freshmen nursing students in a diploma program. The researcher utilized teaching strategies such as case studies, large group discussions, small group interactions, role-playing, questioning, and computer assisted instruction (CAI). The researcher divided the students into four groups. Group one served as the control group and completed CAI unrelated to critical thinking. Group two completed CAI in an area of decisionmaking/critical thinking. Group three received lecture/discussion utilizing critical thinking techniques and completed CAI unrelated to decision making/critical thinking. Group four received lecture discussions utilizing critical thinking techniques and CAI in an area of decision making/critical thinking.

Statistical significance was found in the group that received the greatest number of critical thinking strategies. From this, the researcher concluded that critical thinking could be accomplished at the freshman level. Utilizing a variety of instructional strategies within the classroom was also found to facilitate higher order/critical thinking.

Although there are no current dissertations exploring critical thinking and learning style utilizing the Hanson-Silver Learning Style Inventory for Adults and the California Critical Thinking Disposition Inventory, some were uncovered which used different instruments. Clocklin (1995) explored the relationship between critical thinking skills and learning style in first year nursing students. For this study, the Kolb Learning Style Inventory (KLSI) and the Watson-Glaser Critical Thinking Skills Test were used. Clocklin surveyed licensed practical nursing students, associate degree nursing students, and baccalaureate nursing students. A significant relationship is reported between critical thinking and preferred learning style. Individuals identified as divergers on the Kolb LSI had lower mean composite scores on the critical thinking skills test. Assimilators, accomodators, or convergers, as identified by Kolb, had higher critical thinking scores. Overall, convergers scored the highest on the critical thinking skills tests. Patterson (1994) used a longitudinal study to explore critical thinking and learning style in baccalaureate nursing students. Again, the Kolb Learning Style Inventory and the Watson Glaser Critical Thinking Appraisal were used. The purpose of this study was to correlate the learning styles with the critical thinking abilities. Patterson's (1994), Nathan (1997) investigated learning style and critical thinking in two classes of nursing students during an academic year.

LEARNING STYLES

Learning styles are unique to each student and develop in childhood (Chase, 1995). Learning style theory provides information on how individuals process information and prefer to learn (Garity, 1985). Learning styles are the way individuals concentrate on, absorb, and retain new or different information or skills (Braio, 1987). The quest for understanding learning styles of a population is not new. Research that addresses the learning styles of many populations, health professionals included (Highfleld, 1988), has existed for many years. Some of the original learning style research had its beginnings in the 1970s (Canfield, 1976; Dunn, Dunn, Price, 1979; Kolb, 1976; Renzulli Smith, 1978). Several of these learning style inventories that resulted from early research have been revised and updated (Kolb, 1985; Price, 1996; Renzulli, Smith, Rizza, 1998). Information about student learning styles provides a great deal of enlightenment about how styles can assist educators in maximizing students' potential for success and assist the student in developing additional learning strengths.

Kolb (1984), a major function of education is to shape student attitude and orientation to learning, "to instill positive attitudes toward learning and a thirst for knowledge, and to develop effective learning skills". Kolb's (1976) experiential learning is a concept that describes the central process of human adaptation to their social and physical environment. Kolb (1984) stated that lifelong learning requires learning how to learn and this involves an appreciation of and competence in diverse approaches to creating, manipulating, and communicating knowledge. Kolb also concurred that learning style is an important part of professional mentality and that it represents the learning competencies that promote accomplishment of the specific skills needed for effectiveness in the core professional role.

Learning is an interactive process that occurs in multiple environments and in multiple ways. Learning is defined "as a relatively permanent change in attitude or behavior that occurs as a result of repeated experience" (Sims, Sims, 1995). Keefe's (1987) definition is that "learning is an internal process, we know that it has taken place only when we observe a change of learner behavior of a more or less permanent nature resulting from what has been experienced." Sims and Sims (1995) further clarify learning as an active process that yields the acquisition of additional information or skills. Along these same lines. Bower and Hilgard (1981) offers a broad definition of learning. Learning refers to the change in a subject's behavior or behavior potential to a given situation brought about by the subject" repeated experiences in that situation, provided that the behavior change cannot be explained on the basis of the subject's native responses, tendencies, maturation or temporary states (such as fatigue, drunkenness, drives, and so on) (Bower, Hilgard, 1981).

Learning is both a complex concept and process, as an incredible amount of variability exists in preferences, attitudes, and talents in any group of individuals. What is meant by learning styles? A range of definitions can be found to describe learning styles. One definition states that "learning styles include the cognitive, affective, and physiological" elements of an individual's ability to learn (Bodi, 1990). Another definition holds that learning style includes both the way person masters content and skills and the way a person adapts to reality (Highfleld, 1988).

Gregorc and Butler (1984), learning styles are the "natural qualities of an individual's mind, manifested in four basic learning channels .. . through which distinctive behavior, characteristics and mannerisms" are exhibited. Dunn, Dunn, and Price (1986) have interpreted learning style to mean more than a cognitive processing of information, in that learning style is more comprehensive and inclusive. In their comprehensive approach to identifying and analyzing an adult's individuality "to produce, achieve, create, solve problems, make decisions, or learn," productivity and learning style have been used interchangeably (Price, 1996). The learning or productivity style identifies elements that are critical to a person's ability to produce and maximize individual output, and is based on a complex set of reactions that occur when a person concentrates (Price, 1996). Kingten-Andrews (1991) agree that productivity is an important element of critical thinking (p. 154). And according to Norris (1985), productivity "in the sense of conceiving alternate courses of action and candidates for belief, before critically appraising which alternative to choose," relates to the concept of critical thinking (p. 40).

The majority of research on learning styles in the last three decades has been conducted in laboratory or simulated classroom settings (Witkin, 1977). In an exhaustive review of the nursing literature, De Tornay (1984) discovered that none of the studies that investigated the teaching/learning process in nursing education incorporated a particular conceptual model to examine nursing students' learning styles. Two studies were found that used the Kolb Learning Style Inventory (Kirchhoff, Holzemer, 1979; Merritt, 1983). Another model that have been used with nursing students is the Productivity Environmental Preference Survey (PEPS), that is based on a productivity model (Price, 1996). The PEPS productivity model theorizes that each individual has a biological and developmental set of learning characteristics that are unique (this is congruent with Piaget's (1977) theory of cognitive development). This productivity model reveals how an adult prefers to learn best in order to be productive, and it sets forth patterns through which the highest levels of productivity tend to occur. It is interesting to note that no studies were found that dealt specifically with perceptual and ordering abilities of nursing students based on Gregorc's Mediation Ability Learning Styles conceptual model, a model that had been commonly used in education (Gregorc, 1979). Three learning style models, which are frequently used in the literature, and particularly in education, are the Kolb learning styles inventory, the Productivity Environmental Survey Preference (PEPS), and the Canfield Learning Styles Inventory.

Kolb's Learning Style Inventory

Kolb's (1976) learning style is derived from an experiential learning model based on cognitive information processing patterns, that emphasizes the role experience plays in the learning process. The experiential learning model conceptualizes the learning process in such a way that "differences in individual learning styles and corresponding learning environments can be identified" (Kolb, 1976). Kolb's theory suggested a strong relationship between how people learn and how they problem solve. The LSI is a nine-hem self-description questionnaire that asks the respondent to rank four words in a way that best describe his or her learning style. One word in each hem corresponds to one of the four learning modes: (a) concrete experience, (b) reflective observation, (c) abstract conceptualization, and (d) active experimentation. The LSI measures the importance each individual puts on each of the four modes (Kolb, 1984).

    1. An individual's orientation toward concrete experience emphasizes feeling as opposed to thinking. This individual uses an intuitive, artistic approach as opposed to a systematic, scientific approach to problems (Kolb, 1984).

    2. Reflective observation focuses on understanding the meaning of ideas and situations by careful observations. This orientation emphasizes understanding as opposed to practical application (Kolb, 1984).

    3. An individual with an orientation toward abstract conceptualization focuses on using logic, ideas, and concepts. This orientation emphasizes thinking rather than feeling, scientific approach, and systemic planning (Kolb, 1984).

    4. Orientation toward active experimentation focuses on changing situations. This person is able to take risks in order to achieve their goals. The emphasis is on doing and seeing results (Kolb, 1984).

As a result of our heredity, past life experiences, and present environmental demands learning styles develop. Socialization experiences in family, school, and work determine our reliance on one of the four forms of knowing (Kolb, 1984). The four forms of knowing are (a) convergent, (b) divergent, (c) assimilation, and (d) accommodative.

    1. The convergent learning style relies on the dominant learning abilities of abstract conceptualization and active experimentation.

This individual's strength lies in problem solving, decision making, and the application of ideas. In this learning style, knowledge is organized through hypothetical-deductive reasoning. Convergent people control emotions and prefer technical tasks over social issues (Kolb, 1984).

2. The divergent style of learning emphasizes concrete experience and reflective observation. The emphasis here is on adaptation by observation rather than action. This person performs well when alternative ideas are needed; they are imaginative and feeling oriented (Kolb, 1984).

3. The assimilator has abstract conceptualization and reflective observation as learning style dominance. The assimilator is concerned with ideas and abstract concepts which is similar to the converger, yet the assimilator stresses the importance of the theory being logical (Kolb, 1984).

4. Accommodative learning styles emphasize concrete experience and active experimentation. This style's strengths are carrying out plans and tasks and adaptation to changing immediate circumstances.

Several studies have been conducted using Kolb's experiential model of learning inventory, which focuses on abstract and concrete learners. Cavanaugh, Hogao, and Ramgopal (1995) attempted to identify student nurses' learning styles using Kolb's learning style inventory. In this particular study, which occurred in the United Kingdom, a total of 192 students were administered the Kolb Learning Style Inventory II. Students were found to have fairly evenly distributed learning styles, with no obvious predominance for any one particular style. The percentage of students having a predominantly concrete learning style was 53.7%, while 46.3% were predominantly reflective. These findings corroborate other studies (Laschinger, Boss, 1984) which support Kolb's theoretical tenet that concrete learners tend to choose people-oriented professions. Bodi (1990) and Caine and Caine (1994) recommend the need for a variety of delivery styles with students, with emphasis on participation and experiential learning. The use of the Kolb Learning Style Inventory has received serious criticism in its application in nursing research. Instrument weakness has been cited and therefore "continued use of the Kolb LSI in nursing research or as an experiential technique is not recommended" (DeCoux, 1990).

Canfield Learning Styles Inventory

Gruber and Carriuolo (1991) reported on the Canfield Learning Styles Inventory, an instrument that focuses on assessing learning style preferences in college and secondary students. This inventory provides 16 scales based in three domains: conditions of learning, areas of interest, and modes of learning. Under the domain of conditions for learning, the scales include peers, organization, goal setting, competition, instructor, detail, independence, and authority. In the mode of learning domain, which is the preferred way of obtaining new information, the scales include listening, reading, iconic, and direct experience. There are really two instruments, the Learning Styles Inventory (LSI) for students and the Instructional Styles Inventory *(1ST)* for teachers. Scales on the ISI address the same issues from the instructor's point of view. Gruber and Carriuolo (1991) conducted three studies using the Canfield Learning styles inventory and the Canfield Instructional styles inventory. In each of the three studies, either college students or faculty, administrators, or counselors were given the inventories to complete. The results were analyzed, with detailed descriptions following each.

Merritt (1983) used both the Kolb and Canfield models of learning styles to determine the relationship between age, and age and professional nursing employment experience, to learning style preferences of basic and RN students and the differences in learning style preferences of basic and RN students. The findings of this study for both groups of learners did not support the propositions that age or length of career employment account for differences in the ways adults prefer to leam. Both the nontraditional and traditional students preferred structured environments. The RN (nontraditional) students tend not to prefer instruction that uses reading modes but compared to traditional adult learners, are more positively inclined toward the reading mode. There were significant differences in the learning style preferences between basic and RN students for the conditions and modes of learning as defined by the Canfield model. The results of this study suggest that faculty needs to consider developing different teaching-learning situations for younger versus older, experienced adult learner groups.

The Dunn/Price Learning Style Inventory

The Dunn/Price Learning Style Inventory was initially a 104 item true/false inventory designed for students in grades three through 12. A recent revision provided two formats, one for grades three through five and another for grades six through 12. There are four major categories addressed by this instrument: immediate enviornment, emotionality, sociological needs, and physical needs. From this profile a learning environment conducive to that learning style may be constructed (Karrer, 1988). According to Karrer, this is the most widely used learning style inventory in elementary and secondary schools but is being used in colleges as well.

The Hanson Silver Learning Style Inventory

The Hanson Silver Learning Style Inventory for Adults is based on Jung's theory. There are 25 items with four words that are ranked by the participant. These words describe how the participant ideally learns. After totalling the responses, the participant is able to identify the dominant learning style from four categories: Sensing-Feeling, Sensing-Thinking, Intuition-Feeling, or Intuition-Thinking. The four categories are identified as dominant, auxiliary, tertiary, and inferior. Each of these categories has identifiable goals, objectives, and evaluation strategies that are ideal for the learner. For example, the sensing-thinking (ST) learner's goal is centered on content mastery. Objectives in this category should emphasize recall, practice and demonstration. The ST learner is best evaluated with a true false test. In contrast, the intuition-feeling (NF) learner is characterized as a divergent thinker. Creative and innovative objectives should be designed for the NF learner. Encouraging the application of synthesized learning is an ideal method of evaluation in this category.

The sensing-feeling (SF) learner emphasizes personal relevance and inter/intrapersonal relationships. This learner's goal focuses on "awareness and approval of the selfs assets and liabilities" (Hanson, 1996b). Objectives in this category should enable to learner to plan and execute the assigned work. Evaluations should be designed to allow the SF to demonstrate social and academic maturity. The intuition-thinking (NT) learner is characterized as an inductive/deductive thinker. Goals for the NT should focus on understanding. Objectives for this learner should emphasize analysis, critique, conceptualization, and judgment. The NT learner prefers evaluation methods that test his or her analytical capacity.

Based on these profile instructors can categorize the objectives being taught. As stated earlier, teachers must be aware of their own learning style because it influences the teaching style. Instructors must be willing to flex or accommodate the classroom (Hanson, 1996a).

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