EVIDENCE OF CRITICAL THINKING FROM REFLECTIVE WRITING

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ABSTRACT

RESEARCH PAPER: Evidence of Critical Thinking from Reflective Writing

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Critical thinking is essential for nursing practice but test results of critical thinking have been inconsistent. It has been established that reflection is linked to critical thinking and is a teaching strategy to foster critical thinking. However, a valid and reliable tool is needed to measure reflective writing (Kennison 2006). The purpose of this study is to evaluate the Critical Thinking Scale (CTS) (Kennison, 2006) as a measure of reflective writing and to establish reliability and validity of the tool. This is a replication of Kennison’s (2006) study. The conceptual framework is the definition of critical thinking in nursing (Kennison & Messelwitz, 2002). The study includes a convenience sample of all graduating senior baccalaureate students enrolled in clinical courses at a Midwestern college. All of the students who are about to graduate will be asked to complete written descriptions of their thoughts, feelings, and happenings about a significant practice experience. The California Critical Thinking Skills Test (CCTST) will measure cognitive skills. Findings of this study will provide information for nursing faculty that can be used to evaluate critical thinking skills of students.
Chapter 1

*Introduction*

*Introduction*

Florence Nightingale developed a view of the nurse as a person who dealt with all facets of the patient. She devoted her life to the study of nursing and helped to change the nurse from simple care giver to a trained professional. Tanner (2006) concluded that Florence Nightingale firmly established that observations and their interpretation were the hallmark of trained nursing practice. Critical thinking is an essential skill for the modern nurse (Tanner, 2006). The modern nurse is an active participant in care giving, analysis, treatment, and effectiveness of the treatment for patients.

The nurse has evolved from a basic occupation as care giver to a profession requiring cognitive and relation skills (Martin, 2002). The skills needed for the novice care giver are basic abilities and the innate nature of the person. The development of the nursing professional is important to the safety and health of the patients. In her study, Martin determined that critical thinking was vital to nursing practice. She found that for nurses to progress from novice to expert, they gain experience, knowledge, and critical thinking skills.

The art of thinking critically and making clinical judgments can mean life or death with regards to patient care. Etheridge (2007) found prior research that revealed
new nursing graduates are not competent with making clinical judgments and that
students lacked understanding about their role as nurses to make clinical judgments. The
nursing education system developed methods of reflection to improve critical thinking in
students. However, the ability to measure the effectiveness of the teaching methods and
performance of the student has been more difficult. The Critical Thinking Scale (CTS)
was developed as tool to effectively and reliably measure the critical thinking of the
student (Kennison, 2006).

Background and Significance

The need for critical thinking has been concluded in multiple research projects.
Etheridge (2007) found prior research revealed new nursing graduates were not
competent with making clinical judgments, and students lacked understanding about their
role as nurses to make clinical judgments. Mangena and Chabeli (2005) confirmed
critical thinking was an essential element of the problem solving and knowledge base of
the need for the critical thinking abilities of new graduate and experienced nurses. The
researchers also referred to a National Advisory Council for Nursing Education and
Practice report which had shown the ability of nurses to provide competent care for their
patients required critical thinking skills, problem solving skills, and the ability to
communicate clearly.

Zygmont and Schaefer (2006) found many nurse educators relied on teaching
methods that fostered rote memorization of facts rather than the process of thinking.
Many researchers have promoted reflection with documentation as a viable teaching
method for critical thinking skill development. Taylor-Haslip’s (2010) study found
consistent evidence that reflective guided journal assignments improved performance of nursing students in the clinical area. Reflective journaling was thought to enable the students to become insightful as they recorded their thought processes and made a connection between the rationales of their decision making and actions in the clinical setting. Reflective journaling had been used successfully as a teaching strategy with undergraduate and graduate nursing education. Langley and Brown (2010) found journaling was a tool for facilitating reflective practice and could be used to connect theory with practice.

Shirrell (2008) found critical thinking was often identified as the key to success in nursing practice since accurate clinical decision-making is essential for patient safety. Many standardized tests had been used to evaluate critical thinking in a variety of higher education venues, including nursing education. The researcher found a number of standardized tests had been used for evaluation critical thinking skills. However, the researcher found that the accuracy and validity of these standardized tests had been questioned in assessing the critical thinking of nursing students.

This previous research confirmed the significance of identifying a tool to accurately and reliably measure critical thinking. Kennison (2006) stated the Critical Thinking Scale was developed as a teacher-accessible tool for evaluating rich data of students’ reflective writing about practice experiences during the course of a nursing program. The tool was developed to objectively evaluate critical thinking by evaluating nursing students’ reflective writings. This tool has been tested and refined to evaluate nursing students’ reflective writing for evidence of critical thinking.
**Problem Statement**

A reliable tool is needed to judge reflective writing across academia. An effective tool will allow educators to evaluate and develop teaching methods which increase the critical thinking skills of the nursing professional.

**Purpose**

The purpose of this study was to establish interrater reliability of the Critical Thinking Scale (CTS), a teacher-accessible tool designed to measure the critical thinking of baccalaureate nursing students as evidenced in their reflective writing about their practice experiences. This is a replication of Kennison’s (2006) study.

**Research Question**

1. Are there interrelationships between critical thinking and teacher rating with the Critical Thinking Scale (CTS)?

**Theoretical Model**

The Critical Thinking Scale was developed as a teacher assessable tool which could objectively evaluate critical thinking by evaluating nursing students’ reflective writings (Kennison, 2006). Reflective writing had long been regarded as effective in promoting critical thinking. However, educators were divided in how to best evaluate reflective writings for evidence of critical thinking (Kennison & Misselwitz, 2002).

Kennison and Misselwitz (2002) defined reflection as the purposeful contemplation of thoughts, feelings, and happenings that pertain to recent experiences. The thoughtful reflection allows the student to challenge initial thinking and feelings about the experience. The student can also reflect on the outcome and clarify the personal meaning of the experience.
Writing is a useful mechanism to promote reflection of a situation, explore relations, discover relationships, and make new meanings to past experiences. The written reflection allows students to describe the significant events as they understood them and explore their responses to the situations. Burrows (1995) proposed three basic questions to guide the written reflection: What have I learned from this experience? How would I behave given a similar situation? In what ways do nursing and related theories explain the situation?

Kennison (2006) evaluated The Critical Thinking Scale (CTS) results with the California Critical Thinking Skills Test (CCTST) and validated a positive relationship. The Critical Thinking Scale was found reliable, but extensive training of the rater was necessary. The researcher, Kennison identified that teachers with different areas of expertise may rate practice experiences differently. Teachers with practice experience rate differently than those without experience in practice. Thus, the purpose of this study was to establish interrater reliability of the Critical Thinking Scale (CTS).

*Definition of Terms*

*Critical Thinking: Conceptual*

Critical Thinking is defined as; “a skillful application of knowledge and experience in making discriminating judgments and evaluations” (Shirrell, 2008, p. 131).

*Critical Thinking: Operational*

In this study, critical thinking would be measured using the Critical Thinking Scale. The Critical Thinking Scale (CTS) was developed as tool to objectively evaluate critical thinking by evaluating nursing students’ reflective writings (Kennison, 2006).
Limitations

Because a convenience and small sample size from one institution was used, the results may not be generalizable.

Assumptions

The following assumptions were made in this study:

- “Critical thinking and reflective writing have an inextricable, albeit elusive, relationship that is difficult to describe and measure”. (Kennison, 2006, p. 272).
- “Teaching strategies to foster critical thinking and reflection have been used in isolation, and educators have been unable to consistently predict results of educational interventions”. (Kennison, 2006, p. 269).

Summary

Nurses today are an active participant in the caring and comfort of the patient, the analysis and treatment of the disease, and the resolution of the treatment and disease on the patient. Mangena and Chabeli (2005) confirmed that critical thinking was an essential element of the problem solving and knowledge base of nursing practice. Critical thinking refers to the ability to analyze, infer, evaluate, and use inductive and deductive reasoning (Zygmont & Schaefer, 2006). The purpose of this study was to establish inter-rater reliability of the Critical Thinking Scale (CTS), a teacher-accessible tool designed to measure the critical thinking of baccalaureate nursing students as evidenced in their reflective writing about their practice experiences. The approach of this research used a nonexperimental, descriptive correlational study to address the problem of consistency and fairness in evaluating student nurses’ reflective writing for critical thinking evidence (Kennison, 2006). The significance of the research was to further improve the reliability
of the Critical Thinking Scale as a teacher-accessible tool for evaluating critical thinking skill based on reflective writings.
Chapter II

Review of Literature

Introduction

Critical thinking is essential for nursing practice but test results of critical thinking have been inconsistent. It has been established that reflection is linked to critical thinking and is a teaching strategy to foster critical thinking. However, a valid and reliable tool is needed to measure reflective writing (Kennison, 2006). The ability to accurately and reliably measure reflective writing would provide an accurate and reliable measure of critical thinking of the nursing professional.

Purpose

The purpose of this study was to establish interrater reliability of the Critical Thinking Scale (CTS), a teacher-accessible tool designed to measure the critical thinking of baccalaureate nursing students as evidenced in their reflective writing about their practice experiences. This study is a replication of Kennison’s (2006) study.

Organization of Literature

The literature review to support this study was divided into four sections: (a) conceptual framework; (b) critical thinking skills; (c) reflective writing; and (d) critical thinking and reflection. The chapter concludes with a summary.
Conceptual Framework

Critical thinking and reflection are inextricably linked in nursing practice (Kennison, 2006). These concepts have been studied as related to nursing practice; however, there has been little research on their relationship to each other. Teaching strategies to improve critical thinking and reflection have also been developed; yet, the ability to accurately predict results has been unsuccessful.

The Critical Thinking Scale was developed to be a reliable evaluation tool for reflective writing and the effectiveness of the teaching strategy. The pilot study found inconsistency in how the CTS was used by faculty. The Kennison (2006) research was conducted to establish interrater reliability for this tool. Kennison’s (2006) research used archival data of reflective writings and the California Critical Thinking Skills test results.

Critical Thinking Skills

Nursing curriculum is designed to produce beginning practitioners who are able to make clinical judgments that will ensure patient safety. The art of thinking critically and making clinical judgments can mean life or death with regards to patient care. In the review of the literature, Etheridge (2007) found prior research revealed new nursing graduates were not competent with making clinical judgments, and students lacked understanding about their role as nurses to make clinical judgments. Findings from reviewed studies often reported that students saw themselves as a “help-mate” to the physician, merely taking and following orders. Seeing themselves as problem solvers was a surprise for many nursing graduates.

Etheridge (2007) examined new nursing graduates’ perceptions of learning to make clinical judgments and the beliefs about their role in making such judgments. The
purpose of this study was to study the meaning of making clinical nursing judgments. A goal of this qualitative, phenomenological study was finding strategies to evaluate the ability of new graduates to transition from students to critical thinking registered nurses. New nursing graduates who were working on adult medical-surgical 200-500 bed units in acute care institutions in Western Michigan were chosen for the study. The sample was females between the ages 22-26 who were nursing baccalaureate degree graduates from two 4-year colleges. All had passed the NCLEX exam on the first attempt. These nurses had also participated in nurse intern programs after graduation and were no longer working with a preceptor (Etheridge, 2007).

A descriptive, longitudinal, phenomenological study using semi-structured interviews was used to examine the meaning of making clinical judgments. Use of these methods of study sought to examine students’ lived experiences and identify the strengths and weaknesses of nurses’ ability to think critically (Etheridge, 2007).

The study was introduced by the researchers to the participants, confidentiality was assured, and written consent was obtained. New nursing graduates participated in taped interviews three times in 9 months; within one month after the end of the preceptor experience, 2-3 months later, and approximately 8-9 months after the first interview. The question asked of all participants was “what are the perceptions of new nursing graduates about clinical nursing judgments and the education involved in learning how to make such judgments?” (Etheridge, 2007, p. 25). The researcher also questioned graduates’ beliefs about their need to make clinical nursing judgments, which encouraged reflection of their experiences. Journals were not used in this study to cite reflective thoughts; however, students verbally expressed their views to their instructors and peers.
Findings showed that research participants initially had difficulty with the phrase “making nursing clinical judgments”; however, when the phrase was changed to “think like a nurse,” the connection was made by graduates that the two ideas were one and the same. Analysis of the data suggested that participants saw the transition from being a student nurse to working as a staff nurse as the time they learned to think like a nurse. The ability to think like a nurse was characterized by the emergence of confidence, acceptance of responsibility, the changing of relationships with others, and the ability to think more critically within about one’s work. To think like a nurse required an awareness of one’s self and belief in one’s ability for competence and accountability, characteristics that take time to develop and improve. New graduate nurses lacked confidence with knowing the right information and making a decision based on that knowledge. After 9 months of clinical experience, practicing nurses expressed a new sense of confidence in making complex decisions on their own (Etheridge, 2007).

By participating in this study, Etheridge (2007) found new graduates gained awareness of the amount of responsibility expected of them as practicing nurses, as compared to their experience as student nurses. New graduates recognized that taking responsibility was a significant part of being a nurse and felt that this understanding came with the experience of interaction with patients and their families, and other health care professionals. New graduates’ lack of confidence and inability to trust their own decisions caused them to seek answers from other authority figures. With repeated clinical experience, new graduates appeared to be more confident in their ability to think like a nurse and provide safe patient care. The clinical setting provided the correlation of classroom learning when actual practice occurred.
Etheridge (2007) acknowledged the study was limited because the findings were based largely on interpretation and quality of the interviewer’s interaction with the subjects. The researcher also indicated that a larger sampling using similar questions would validate the findings of this research. New graduates viewed faculty as role models and expected faculty to ask them questions, and challenge them to think like nurses. The implications of the study pointed to the need for educators and preceptors to assist learners, not by answering their questions, but by providing the opportunity for reasoning and critical thinking.

Etheridge (2007) concluded that the students had no conception of the amount and types of clinical nursing judgments that were required of nurses. She also concluded that the question remained on how best to foster the learning of critical thinking skills, whether through more hands-on experience, more instructor or peer intervention, or increased support systems, all of which were positive forces in the study group. However, it appeared that the ability to think like a nurse was gained in the clinical setting with patients. New nurses benefitted from being with patients because it helped all of their training and skills to come together in practice.

In a review of the literature, Shirrell (2008) found that critical thinking was often identified as the key to success in nursing practice since accurate clinical decision-making was essential for patient safety. Many standardized tests had been used to evaluate critical thinking in a variety of higher education venues, including nursing education. However, the researcher found that the accuracy and validity of these standardized tests had been questioned in assessing the critical thinking of nursing students.
This purpose of this retrospective quantitative research study was to identify if a predictive relationship existed between critical thinking and success in nursing; success being defined as passing the NCLEX-RN exam on the first attempt. The study also explored the relationship between critical thinking as measured by the Collegiate Assessment of Academic Proficiency (CAAP) critical thinking test scores and grade point average (GPA) in nursing and science courses (Shirrell, 2008).

The theoretical framework for this study was McPeck’s Critical Thinking Theory. The inference of this framework was that “critical thinking demands a skillful application of knowledge and experience in making discriminating judgments and evaluations” (Shirrell, 2008, p. 131). From the perspective of the framework, nurses must have knowledge of nursing, the arts, and sciences and must also be able to apply this knowledge to make judgments and evaluation in providing patient care.

The sample population for the study was all students who graduated with an associate of applied science degree in nursing from a private Midwestern college. The sample included all graduating nursing students (n=173) from 2001-2006 who had taken the NCLEX-RN exam. Data was collected from the college database, with respect to anonymity, review of nursing students’ GPA from all science classes in the nursing program, pass-fail data, and test scores on the CAAP critical thinking test (Shirrell, 2008).

There were three research questions for the quantitative study. The first question investigated if the CAAP critical thinking score of each student in the sample was predictive of passing the NCLEX-RN exam. The second question explored any relationship between CAAP critical thinking test scores and the students’ final GPA in
their nursing courses. The third question explored any relationship which existed between
the CAAP critical thinking test scores and the nursing student’s final GPA in science
courses (Shirrell, 2008).

Data was analyzed using descriptive and inferential statistics via the Statistical
Package for the Social Sciences. The level of significance for this study was set at .01.
The analysis began by defining the dependent variable as success in nursing as passing
NCLEX-RN on the first attempt, a 1=pass and 0-fail. A multiple linear regression model
was used to analyze the first question. The Pearson product-moment correlation
coefficient analysis was used on the second and third questions between each of the
independent variables, which confirmed past correlation predictions of success in nursing
based on GPA of nursing and science courses and critical thinking (Shirrell, 2008).

The nursing GPA for the sample population ranged from 1.9 to 4.0 with a mean of
2.72 (SD=.4381); science GPA ranged from 1.8 to 4.0 with a mean of 2.89 (SD=.5576);
critical thinking scores ranged from 52 to 72 with a mean score of 62.23 (SD=4.888).
Multiple regression analysis was used to corroborate the findings. Pearson product-
moment correlation analysis showed a correlation of .372 (p < .0001) between nursing
GPA and critical thinking scores (Shirrell, 2008).

According to Shirrell (2008), a model containing critical thinking, GPA in
nursing, and GPA in science courses had been predictive of success in nursing.
However, the results of this study showed that critical thinking, as measured by the
CAAP test alone, was not a good predictor of passing the NCLEX-RN exam. Being a
good critical thinker in one subject did not guarantee such positive results in other
subjects. Another significant finding of this study was that for every increase in GPA of 1.0, the student was 34 times more likely to pass the NCLEX-RN.

Shirrell (2008) reviewed limitations of the study. This study used a convenience sample of associate nursing graduates from only one Midwestern college. The results, therefore, would not be indicative of all associate degree nursing students. The researcher also concluded that other uncontrolled variables; such as illness, fatigue, motivation and anxiety should be taken into account with regards to scores on the critical thinking test and the student’s ability to pass the NCLEX-RN.

Shirrell (2008) concluded that even though the results of this study showed that critical thinking alone was not a good predictor of success, critical thinking skills are essential to the practice of nursing. The students’ nursing GPA was a significant predictor of success on NCLEX-RN and should be closely monitored by the student and advisor to prompt remediation as needed. The nursing GPA was the only significant predictor of passing the NCLEX-RN. For example, as previously mentioned, for every 1.0 increase in GPA, the odds of success in passing the NCLEX-RN increased by 34 times. The researcher pointed out that these study results were similar to an earlier study by Yin and Burger comparing overall GPA and success on the NCLEX-RN.

Shirrell (2008) advocated that future research should seek collaboration between nursing programs because samples of convenience have typically been used in past studies. The researcher also concluded that additional research was needed to further understand the relationship between critical thinking and nursing, with emphasis on establishing a reliable instrument to evaluate critical thinking skills specific to nursing.
In their review of the literature, Mangena and Chabeli (2005) confirmed that critical thinking was an essential element of the problem solving and knowledge base of nursing practice. Prior research had shown nursing duties were often routine and lacked any critical thinking ability. However, an identified goal of nurse educators should be the development of graduates with higher-order critical thinking skills.

The purpose of this research study was to describe strategies to overcome the obstacles in the facilitation of critical thinking in nursing education by exploring the perceptions of nurse educators and students. The design of the study was qualitative, exploratory, descriptive, and contextual (Mangena & Chabeli, 2005).

A purposeful sample of nurse educators and fourth year nursing students was taken from two colleges. The sample was seven educators from a population of 95 and 12 nursing students from a population of 145 (Mangena & Chabeli, 2005).

Focus group interviews were used to collect data from the two groups and a qualitative and quantitative approach was used to analyze the data. The interviewees explored and described their perceptions of obstacles in the facilitation of critical thinking in nursing education. The following research questions were used in the interviews: “What are the obstacles in the facilitation of critical thinking in nursing education? and How can the obstacles in the facilitation of critical thinking be overcome?” (Mangena & Chabeli, 2005, p. 292). With permission from each participant, the interviews were recorded and notes taken by the researcher. Tesch’s descriptive method of open coding was used both by the researcher, as well as an independent coder, to verify the accuracy of the data analysis. Trustworthiness of the study was assessed with criteria such as credibility, transferability, dependability, and conformability.
The findings of the interviews were recontextualised to formulate strategies to overcome five identified obstacles in the facilitation of critical thinking. The first obstacle was the educators’ lack of knowledge. Examples of participant’s comments included: “One cannot teach critical thinking if one is not a critical thinker;” “We have to move out of our comfort zone of teacher-centered education;” and “We need to keep abreast with what is going on in nursing education” (Mangena & Chabeli, 2005, p. 293). The researcher concluded these comments indicated the participants recognized that educators must embrace lifelong learning to resolve this obstacle. Strategies formulated to overcome this identified obstacle included reading research articles and participation in seminars, workshops and conferences on critical thinking.

The second identified obstacle was teaching and assessment methods not facilitative of critical thinking. One study the participant educator said, “There is a need to teach critical thinking as a subject;” and a student participant said, “Instead of lecturing and writing notes from transparencies, we could be given a scenario or real patient to comprehensively assess” (Mangena & Chabeli, 2005, p. 294). In indicating strategies to overcome this identified obstacle, the researchers proposed the provision of thought-provoking and engaging learning tasks which could facilitate critical thinking.

The third identified obstacle from the data analysis was negative attitude and resistance to change by the educators. One student commented, “Educators need to be open to challenge by the students and stop feeling threatened;” and another student said, “The tutors must stop assuming that the students do not know what they are talking about” (Mangena & Chabeli, 2005, p. 295). The researchers proposed transforming the teacher-student relationship from a power relationship to a peer relationship would
promote a teaching-learning partnership with emphasis on a student centered approach to learning.

The fourth obstacle was student selection and educational background. An educator commented, “We need to find selection criteria that will specifically test for foundational critical thinking that we can build on;” and another educator said, “Need to have a reading comprehension skill program to assist the students” (Mangen & Chabeli, 2005, p. 295). The researchers concluded it was necessary to design special intelligence, aptitude, and attitude tests to measure various characteristics and motivation. The researchers also recommended including mathematics, physical science, and biology courses which form a basis and facilitate critical thinking in the student’s profile.

The last obstacle which was identified was socialization, culture, and language. One educator participant commented, “There is a need for the educator to create a culturally non-threatening environment in the classroom and clinical setting;” and a student participant said, “During group discussion when they should be engaged in constructive debate and discourse they are most of the time busy trying to translate” (Mangen & Chabeli, 2005, p. 296). The researchers concluded learners should be engaged in activities which explore culture differences in perceptions, belief, and values in order to identify culture-related problems. Results seem to indicate that culture could either facilitate or hinder the thinking process, since different groups reacted differently to group interaction. The researchers suggested that educators need to create a climate conducive for group interaction, and the culturally sensitive educator should encourage peer tutoring, comparing, and contrasting viewpoints. It was concluded that identifying
and acknowledging the different cultural backgrounds of learners would facilitate learning and critical thinking.

There were several recommendations from the study to improve the critical thinking skill of nurses. Mangena and Chabeli (2005) believed educators must continuously renew their knowledge skills and strive to engage in on-going learning to ensure they are abreast with the current nursing education. It was recommended that nurse educators not become rote in their thinking and teaching capabilities. The learning institution, educator, and learner all must take responsibility to achieve the goal of improving critical thinking of nurses. The learning institution should review the curricula to ensure critical thinking is developed from the beginning and becomes entrenched in the learners. The nurse educators need to review their teaching and assessment methods, create an environment, and encourage learners to take ownership of their critical thinking skills. The researchers also advocated that classrooms needed to provide a supportive environment for teaching and learning skills. The students should take ownership of their education and strive to develop critical thinking skills. Reflective journal writing and debates were proposed as examples of modalities that could be introduced to encourage students to analyze, interpret, and synthesize situations. A final recommendation proposed further research to see if nurse educators themselves are critical thinkers, as one cannot teach what is unknown.

Mangena and Chabeli (2005) concluded that critical thinking was an essential dimension in nursing education. The researchers stressed that the nursing profession cannot afford to produce practitioners who just perform routine work. The art of nursing must also incorporate a high-level of reasoning, problem solving, and critical judgments.
The results of the study added to prior findings that the education of critical thinking nurses must begin with educating critical thinking educators.

In their review of the literature, Fero et al. (2009) substantiated the need for the critical thinking abilities of new graduate and experienced nurses. An earlier international survey had revealed between one-quarter and one-third of patients with health problems across the world had experienced medical, medication, or testing errors. Such prior studies confirmed the importance of an investigative focus of identifying critical thinking needs of nurses to help in preventing such errors in healthcare practice. The researchers also referred to a National Advisory Council for Nursing Education and Practice report which had shown the ability of nurses to provide competent care for their patients required critical thinking skills, problem solving skills, and ability to communicate clearly.

The purpose of this study was to identify the critical thinking learning needs of new and experienced nurses who had varying levels of experience and education. Although the literature review indicated there was no accepted definition of critical thinking in the field of nursing interpretation, analysis, evaluation, inference, explanation, and self-regulation were noted components. The researchers’ stated their hypothesis as: “. . . nurses having more years of experience and those prepared at the baccalaureate level would have a higher rate of meeting expectations on the Performance Based Development System Assessment (PBDS)” (Fero et al., 2009, p. 141). The PBDS was designed to identify critical thinking learning needs of nurses. Results from the assessment might be used by the healthcare agency staff to help formulate an individualized plan of action to better prepare the nurse for safe clinical practice.
The theoretical framework for this study was Benner’s Novice to Expert Model. Benner’s model was developed with descriptive research incorporating the Dreyfus Model of Skill Acquisition that identified five levels of competence. The researchers describes Benner’s five basic levels as: (a) novice, a new nursing graduate who operates in a limited and prescribed way; (b) advance beginner, performs at a marginally acceptable level; (c) competent, is able to determine which aspects of a situation are considered more relevant; (d) proficient, begins to perceive the meaning of a situation through reflection on previous experience, and often modifies plans based on the response to the event; (e) expert, has an intuitive grasp of a critical situation and understands deeply what is needed to ensure resolution (Fero et al., 2009).

A consecutive sample of 2144 newly hired nurses in a university affiliated healthcare system completed the PBDS assessment which consisted of 10 videotaped vignettes depicting change in patient status. The objectives that the researchers wanted to address in the research study were: (a) the overall rate at which nurses meet expectations on the PBDS assessment; (b) the relationship between meeting PBDS expectations and years of nursing experience controlling for preparation level; and (c) the relationship between meeting PBDS expectations and nurses’ preparation level (diploma, associate, baccalaureate) controlling for years of nursing experience (Fero et al., 2009).

The sample population included newly employed nurses from the same university healthcare system. The healthcare system included 19 acute care systems, specialty, community, and regional hospitals in southwestern Pennsylvania. Analysis was retroactive to January 1, 2004 through September 30, 2006. All nurses were assessed using the PBDS at the time of employment (Fero et al., 2009).
Data obtained from the education department of the healthcare system included the number of nurses who took the PBDS assessment, years of experience, level of preparation (diploma, associate, or baccalaureate), and PBDS scores. The study design was a post hoc retrospective analysis of PBDS assessment data collected during the first two weeks of employment at the hospital. Nurses taking the assessment were given a preset amount of time to watch a series of 10 videotaped vignettes of common clinical problems and then asked to write their responses. Nurse raters (n=15) held master’s degrees, had more than 10 years of clinical experience, and had completed 9-12 months of PBDS rater training. Assessments were performed annually to ascertain interrater reliability and validate competence of the rater (Fero et al., 2009).

Statistics were calculated using SPSS, version 14.0, of descriptive data for the entire sample, which included years of experience, academic preparation (diploma or degree), and overall assessment rating. The chi-square test and Pearson chi-square were used to analyze differences in years of experience and level of preparation (Fero et al., 2009).

Fero et al. (2009) found nurses with more years of experience rated higher on the PBDS assessment. The data also revealed differences related to level of preparation; nurses with more experience who were prepared at the baccalaureate or associate level scored higher on the assessment than experienced nurses with diploma level preparation.

The difference due to level of preparation was not consistent with previous PBDS research results; which according to Fero et al. (2009), found no consistent difference in clinical judgment ability based on education and experience. Of the newly hired nurses, the majority (74.9%) met expectations on the PBDS assessment. Nurses who did not
meet expectations totaled 539, of whom 97.2% did not initiate proper nursing interventions, 67.0% did not differentiate urgency, 65.4% did not report essential clinical data, 62.8% did not adhere to relevant medical orders, 62.6% did not understand their decision rationale, and 57.1% were unable to recognize problems. Nurses with the least experience had the highest rate of not meeting expectations while those who had the most experience had the lowest rate (Fero et al., 2009).

Fero et al. (2009) concluded that previous research studies had confirmed critical thinking, problem solving, and expert communication skills were a vital part of nursing practice and these skills needed to be incorporated into nursing education. Prior research had also shown that many nurses with one year or less of experience failed to meet expectations on the PBDS assessment. This current study found 25% of newly hired nurses were deficient in critical thinking ability, problem recognition, reporting of clinical data, and making nursing judgments. New graduates were also less likely to meet assessment expectations compared with nurses with 10 years experience or more.

The researchers indicated this research posed a number of limitations. Analysis was limited to data collected at the time of PBDS assessment (level of preparation and years of nursing experience). Personal information, such as age, gender, prior healthcare experience in addition to nursing, employment, location, and length of employment, was unavailable, and such variables might have altered the results (Fero et al., 2009).

Regardless of the limitations, Fero et al. (2009) believed assessments, such as the PBDS, could assist with learning needs and aid in individualized orientation of the nurse. The researchers concluded research was needed to identify specific areas of critical thinking deficiency and test objective, educational strategies to foster critical thinking in
nurses. According to the researchers, improving critical thinking skills of nurses has the potential to contribute greatly to the advancement of nursing practice and safe patient care.

Advanced cognitive skills are needed in the health care environment, including the ability to engage in reflective thinking, use metacognitive strategies, and apply the nursing process. The question remains on how best to provide these skills in nursing education. Zygmont and Schaefer (2006) suggested the answer may be a combination of essential ingredients consisting of an education that encourages critical thinking, work experience, and mentoring. In their review of the literature, the researchers found many nurse educators rely on teaching methods that foster rote memorization of facts rather than the process of thinking. Rather than engaging students in the learning process, faculty focuses on the transmission of knowledge. Educators use program-specific definitions for critical thinking for both graduate and undergraduate programs but only use standardized testing to evaluate the students’ progression.

The purpose of this study was to determine critical thinking skills of nurse faculty and explore the relationship between their epistemological position and critical thinking. Critical thinking (CT) refers to the ability to analyze, infer, evaluate, and use inductive and deductive reasoning. Epistemology is referred to as one’s understanding of knowledge: static, absolute, relative, or situational. The framework for this study was based on Duldt’s proposal that current faculty members came from an educational system that did not teach critical thinking. This proposal questions the ability of nurse faculty to foster and develop critical thinking skills with students (Zygmont & Schaefer, 2006).
The sample for this study consisted of 300 full time faculty from the National League for Nursing (NLN) member schools. The sample was a randomized national sample which included all types of nursing education programs, with the exception of doctorate programs. Exclusions from this study included faculty who had completed the California Critical Thinking Skills Test (CCTST) or the Learning Environment Preferences (LEP) in the past or administered these tests in their nursing programs (Zygmont & Schaefer, 2006).

The sample included 75 percent of females with a mean age of 50.66 years (SD=6.61). The majority of the sample (78.4 percent) had no education in CT, and 18.9 percent had attended CT educational programs. Most faculty (81.1 percent) were responsible for both classroom and clinical instruction. A small percentage of the sample (2.7 percent) taught exclusively in the classroom or clinical setting, and 8.1 percent of participants were involved in a combined-faculty/administrative position (Zygmont & Schaefer, 2006).

The researchers sent five packets with the CCTST, LEP, demographic questionnaire, return envelope, and a response card noting the willingness to be interviewed to the director or chair of a random sample of 60 schools of nursing. Since response rates were low, additional packets were mailed to a convenience sample of 50 schools, not necessarily NLN member schools. Zygmont and Schaefer (2006) used a descriptive correlation design, with a combination of quantitative and qualitative methods. There were three instruments used in this study. The CCST was used to measure the CT skills of faculty and to evaluate their skills of analysis, inference, evaluation and reasoning. The LEP was used to assess the learning environment.
preference, which was an indication of epistemological position. There was also a demographic questionnaire.

The CCTST measured critical thinking ability based on a 34-item multiple choice instrument. Reliability was established with a Kuder Richardson value of 0.68 to 0.75. The CCTST reliability coefficient was 0.86 for the study. The LEP engaged faculty in a series of questions with responses of ‘not at all significant’ to ‘very significant’ based on four-point Likert scale. Overall reliability for the LEP was 0.79. The researchers also developed a demographic questionnaire to identify age, gender, years of experience, and level of critical thinking education. Data were also collected by telephone interviews lasted about 60 minutes. The interviews were audio taped and transcribed verbatim. Each researcher reviewed the transcripts independently (Zygmont & Schaefer, 2006).

Analysis of the CCTST indicated that faculty varied considerably in their ability to think critically. The mean score on the CCTST of 19.14 (SD=6.76) revealed that most faculty were considerably more skilled at CT than a senior college student; 70 percent achieved a total score of 19 or greater. When comparing findings of students enrolled in a graduate nursing program, the mean scores were similar. This led the researchers to believe critical thinking occurs over time, CT skills may include not only education, but time and experience, and there may be a relationship between the ability of nurse faculty to exhibit critical thinking skills and the ability of the student to learn critical thinking (Zygmont & Schaefer, 2006).

Zygmont and Schaefer (2006) found no correlation among scores of the total CCTST and the subscales. However, positive correlations were noted between the total score and the inference, evaluation, induction, and deduction subscales. Most faculty
examples of analysis, evaluation, and inference were from the clinical area with only three examples from the classroom. When analyzed for correlations between the CCTST and the demographic questionnaire, a low, negative correlation was found between age and the evaluation subscale \((r=-.289, p .04)\). LEP results suggested that participants had not yet reached the intellectual level required for critical thinking, with negative correlations found with years of graduate teaching \((r=-.389, p < .04)\). Zygmont and Schaefer (2006) suggested that faculty transfer their ability to engage students in critical thinking in the clinical setting to the classroom settings. The research found that benchmarks can be established on the ability of faculty to engage in critical thinking.

According to the researchers, the study was limited by the small convenience sample and by the LEP design, which favored classroom teaching. However, in this case study, the LEP was significant because all but three of the examples were clinical. Unfortunately, the LEP results suggested faculty have an understanding of critical thinking in the clinical setting but have not made the transition to incorporate critical thinking in the classroom setting. Faculty and non-faculty expressed the need to repeat this study using a larger sample size. Comments, such as “This study has been needed for a long time;” suggested faculty had the potential to be more receptive to being critically reflective. Zygmont and Schaefer (2006) concluded the challenge remained as to how best to transfer the ability to foster critical thinking in the clinical area into the classroom.

*Reflective Writing*

In the review of the literature, Taylor-Haslip (2010) found consistent evidence that reflective guided journal assignments would improve performance of nursing
students in the clinical area. Reflective journaling was thought to enable students to become insightful as they record their thought processes and make a connection between the rationales of their decision making and actions in the clinical setting. Prior research had shown reflective journals stimulate students’ thinking about theoretical and clinical concepts. The guided reflective journal writing had helped the student progress beyond academic learning to improved practical experience.

The purpose of the study was to examine the correlation between the use of guided reflective journals and student academic success when evaluating student progress on examinations and clinical performance over the semester course time span. The thought was if students reflected on their own actions through guided reflective journals, they would be more successful in the clinical setting and on examination performance. The conceptual framework for the study was based on Hatton and Smith’s operational definition of levels of reflective criteria. The levels were progressive, beginning with descriptive writing, descriptive reflection, dialogic reflection, and ending with critical reflective writing. The researcher contended that learners needed to be aware of their attitudes towards learning and that reflection allows students to see the big picture, thus enabling better clinical experiences. It was proposed that reflection could guide the student to areas of strength and weakness and direct them to improve their performance. The author asserted reflective writing via a guided journal would allow students to focus on what they have accomplished in the clinical setting in direct correlation with how much knowledge they have attained (Taylor-Haslip, 2010).

The sample for this study included 28 women and 2 men who worked mother-baby and pediatric clinical rotations at a major municipal hospital. Students ranged in
age from the mid 20s to mid 50s, and most of the participants were both working and attending school. Students were required to keep a journal of their learning experiences and reflections over the entire semester. They were to cite any references used to support the rationale of their decisions and actions during the clinical experience. Instructions were clearly written and provided to students on the first day of class along with verbal instructions given on the process of journal writings and the expectations of each assignment. Students were admonished to establish a personal clinical goal for each clinical day and then reflect on the process of achieving this goal. To better perform in the clinical settings, students were advised to research areas where they felt more knowledge was needed and to reflect on their readiness to perform. Finally, students were asked to reflect on what they would do differently to improve circumstances in order to reach their designated goals. Confidentiality of journal contents was assured, and students met with their instructor weekly during the entire semester (Taylor-Haslip, 2010).

Evaluation of the students’ reflective writings was based on Hatton and Smith’s levels of reflective writing criteria. Students were able to demonstrate each type of reflection except critical reflection, which was absent in all journal writings. Students’ initial journal entries revealed descriptive writing, which basically recorded events without describing why actions were taken or feelings about the accomplishment. However, with feedback from the instructor, students were able to engage in reflective writing, which explained students’ reasons for their actions based on personal judgment or literature review. This level of reflective writing remained consistent throughout the course. Very few students were able to incorporate dialogic reflection, conversation with
themselves, questioning their decisions, explaining possible outcomes, or revealing evidence of their use of judgment about clinical situations in their writings. The fourth level of reflective criteria, critical reflective writing, reveals awareness and rationale for one’s actions based on the content of their experience. No students demonstrated this level of reflective writing during this study (Taylor-Haslip, 2010).

Evaluations of the journals were done during the first week of the assignment with verbal and written feedback provided by the instructor, after which, a higher level of reflection was demonstrated in the journal entries. At the end of the semester, journals were again evaluated based on the criteria of Hatton and Smith operational definitions. Findings revealed 3 students had engaged in descriptive writing, 14 used descriptive reflective writing, and 13 students demonstrated dialogic reflective writing. When evaluating student progress on examinations and clinical performance over the course of a semester, a comparison was made between the use of guided reflective journals and student academic success. Findings of this study showed a strong correlation between higher exam scores and reflective writing, although the researcher noted an unexplained decline during week 8 of average examination scores, depicting a need for further investigation (Taylor-Haslip, 2010).

Based on the research findings, the author asserted that a moderate to high level of reflection is necessary for students to be successful, both in the classroom and clinical environment. The author believed students must exhibit self-consciousness and be fully aware of their capabilities and limitations, with regards to decision making and patient care. Beginning students were proficient in reporting events. Taylor-Haslip (2010)
concluded that guided reflective writing involving self-inquisition helped the student develop higher levels of critical thinking and decision making skills.

In their review of the literature, Baxter and Rideout (2006) confirmed that decision making has been recognized as the cornerstone and a defining characteristic of the nurse and the nursing profession by many researchers. The literature review only yielded a few studies which contrasted experienced nurses and nursing students and that compared clinical judgment abilities of baccalaureate and non-baccalaureate graduates. These studies focused on the progression of a nurse from novice to expert. Some other studies researched the development of critical thinking during the baccalaureate programs. These studies found a relationship between critical thinking and decision making, which were contrary to other studies which discovered no relationship between critical thinking and decision making. A larger number of studies focused on the factors that influence decision making, such as experience, knowledge, control, and confidence. Although a variety of studies have been done, the researchers stated, “There is also a lack of understanding regarding the types of decisions students are making, how they determine the need to make a decision, and how they respond when a patient care decision is required” (Baxter & Rideout, 2006, p. 121).

The purpose of this study was to explore the decision-making activities of baccalaureate nursing students during their second year of a 4 year program. The study was designed to discover how second-year baccalaureate nursing students determined the need to make a clinical decision, how they responded to a pending clinical decision. The study also aimed to discover the types of decisions nursing students make and explore the factors that enhanced the decision making process. This qualitative, intrinsic study
followed the approach of studies by both Merriam and Yin because of the opportunity for an in-depth search of various information-rich sources (Baxter & Rideout, 2006).

The researchers used purposeful sampling to obtain 12 student nurse participants and two faculty tutor participants for this study. Each participant received a letter of introduction to the study and assurance that all results would be anonymous. Written consent was obtained. The participants were second-year-nursing students enrolled in their first clinical rotation on one of two inpatient units at a large teaching hospital in Ontario as well as the faculty tutor on each of the units with the students. The students in this study provided direct patient care under supervision of a clinical tutor for 7 hours per week for a 12 week term. The role of the clinical tutor was to provide support, facilitate learning, and offer feedback to the students (Baxter & Rideout, 2006).

Data was collected using student journals and unstructured interviews to explore the student’s ability to make in-depth decisions. The students were provided with guidelines for keeping journals during the clinical day for a period of 2 weeks. They were given guidelines for reflection and asked to describe, elaborate, analyze, and reflect on their clinical experiences, as well as how they could improve on their decision-making choices. Students were expected to write in their journals at the end of each clinical day for a period of 2 weeks, as the journals were to be used for discussion in the upcoming interviews. The journals were reviewed by the researchers. This journal review provided the basis for the unstructured interviews with the students. Semi-structure interviews were conducted with the two tutors. The interviews were audio taped and transcribed verbatim (Baxter & Rideout, 2006).
Inductive data analysis was used to compare students’ encounters with patient, nursing staff, and clinical tutor. The data revealed students were challenged when faced with making sound, independent decisions. The most complex was the patient encounter because the greatest number of clinical decisions were recognized and responded to. Student’s responses were both emotion-based and knowledge-based. The emotion-based originated from the student’s lack of confidence and fear. Lack of confidence had a negative influence on the student’s ability to make a clinical decision and to act independently. When the students identified that a clinical decision needed to be made and were unsure what to do, they did quickly seek advice from a nurse and were able to meet the patient’s needs. Students’ knowledge-based responses enabled them to feel that they could independently make safe clinical decisions. Also, the knowledge allowed students to determine the need for a clinical decision (Baxter & Rideout, 2006).

The nursing staff encounter was primarily to seek assistance in determining the need for a clinical decision, what decision needed to be made, and to seek information or support. The documented students’ responses were all emotion-based on respect for the staff, fear of upsetting, or angering the nursing staff. However, when unclear about a situation, students were quick to engage the advice of a nurse, and at no time did they fail to meet their patient’s needs. The tutor encounter received the least amount of attention from the students. The students described the clinical tutor as someone who helped them determine the need for a clinical decision, influence their response to a clinical decision, and provide them with support. Students’ knowledge base, level of confidence, and fear all factored in with their ability to make clinical decisions. Baxter and Rideout (2006) found students in the study made decisions based on the needs of the patients.
The findings from this study supported the suggestion that the clinical setting is very stressful for nursing students. The researchers concluded that curriculum developers and clinical tutors must prepare their students for their clinical experiences through laboratory sessions. These sessions will help to address intimidation, fear, role of the nursing student, patient, and nursing staff to better prepare the novice students for the actual clinical setting. The research findings also suggested that students need to be taught of the potential sources of conflict and strategies to manage such conflicts and strategies when in the clinical settings. Communication and conflict resolution skills should be taught prior to and ongoing during the clinical rotations. This research reinforced the need for clinical tutors to become more engaged with making sound clinical decisions. Baxter and Rideout (2006) concluded more research is needed to fully understand how students make clinical decisions and how nurse educators can facilitate this ability.

One of the greatest challenges for nursing students while in the clinical setting is the ability to make independent clinical decisions. The findings of the researchers revealed that student encounters with the patient, tutor, and nurse influenced their decision making abilities. This helped educators understand whether student decisions were knowledge based, emotional, or both. The need to provide a safe, supportive clinical learning environment where students feel confident, less frightened, and less intimidated was reinforced in this study and was deemed necessary to impede the decision-making process (Baxter & Rideout, 2006).

In a review of literature, Murphy (2004) discovered previous studies that failed to definitively correlate critical thinking measures with critical thinking necessary for
nursing practice. As Murphy (p. 227) stated, “…clinical reasoning is expected to be a better measure of skills nurses must possess in the health care setting”.

The framework for Murphy’s research (2004) was based on several propositions. The use of focused reflection would promote the development of clinical reasoning. Written or verbal articulation of thoughts would facilitate the development of clinical reasoning. And reflection and articulation that focuses on connecting new experiences to existing knowledge would enhance the development of clinical reasoning.

The purpose of this study was to ascertain whether instruction using focused reflection and articulation would enhance the development of clinical reasoning. Based on the literature review, previous research had failed to definitively correlate critical thinking measures with critical thinking necessary for nursing practice. As Murphy (2004) stated, “…clinical reasoning is expected to be a better measure of skills nurses must possess in the health care setting” (p. 277).

The researcher used three propositions. The first proposition consisted of the use of focused reflection to promote the development of clinical reasoning. Research had indicated that reflection decreased error rates, correlated with self-regulation and affected learning positively. The second proposition was written or verbal articulation of thoughts would facilitate the development of clinical reasoning. Research had shown the positive effects of using written and verbal reflective exercises as a means of articulation. Reflection and articulation focused on connecting new experiences to existing knowledge would enhance the development of clinical reasoning. Researchers had found that attention to learning improved theory to practice integration in nursing student when they focused on reflection and articulation (Murphy, 2004).
The sample for the research study included four volunteer clinical groups of first semester nursing students (N=33) and their instructors (N=4) from a community college nursing program. A two-hour workshop emphasizing use of focused reflection and articulation to connect clinical experience to classroom content was held at the beginning of the semester and reinforced throughout the semester. The comparison group did not receive the instruction or reinforcement. Students and instructors were randomly assigned to control groups, which were located at different campuses (Murphy, 2004).

To determine whether instruction in the use of focused reflection and articulation would enhance the development of clinical reasoning, Murphy (2004) developed two research questions for the study. The questions were:

To what extent is there a difference in clinical reasoning as measured by: a) ability to assess and analyze patient data, and b) domain-specific knowledge of assessments between nursing students who received explicit instruction in the treatment methods (i.e., focused reflection and articulation) and students who did not receive instruction in the treatment methods?

In what ways did students with high clinical reasoning scores and students with low clinical reasoning scores differ in relation to: a) use of focused reflection and articulation, and b) perception of how their use of focused reflection and articulation affected their learning? (Murphy, 2004, p. 227)

Students’ written assessments were evaluated by the clinical instructors by means of the Assessment and Analysis Instrument (AAI), which was designed by the researcher based on Gordon’s Functional Patterns to evaluate students’ analytical ability. Assessments were rated on comprehensiveness, priority, and accuracy of nursing
diagnoses. Using the 5-point Likert scale, each point was prorated to the percent-observed to reduce error variance among raters. By measuring internal consistency, reliability of the instrument was found to be acceptable. Unit test exams which consisted of 31 and 34 multiple choice questions respectfully were used to assess knowledge of nursing assessments and analysis. Students kept a record of the frequency and perceived effectiveness of the use of focused reflection and articulation in their clinical settings, which were then checked by the researcher-developed Reflection and Articulation Inventory (RAI). Scores of assessment and analytical ability were assessed during weeks; 7, 15, and end of the semester. The results were used to identify students who used reflection and articulation without prior instruction. Qualitative data obtained from the interviews revealed differences between high and low scorers with regards to clinical measures (Murphy, 2004).

The analyzed data did not show a significant difference in scores of clinical reasoning; however, there was a significant difference on the practice measure of clinical reasoning (d=1.22, t=3.33, p<.01). The results of one study proved there was no difference in knowledge measures of clinical reasoning. The value of using focused reflection and articulation to promote clinical reasoning was supported by the interviews of the high and low clinical reasoners. The high clinical reasoners described their clinical experiences and feelings in detail, but the low reasoners’ comments were less informative (Murphy, 2004).

The evidence the researchers provided proved that focus on the application of theory in the classroom enhanced reasoning skills. When students learned to incorporate classroom learning and clinical experience, the clinical reasoning connection could be
made. Faculty then had the ability to focus, guide, and direct students in the practice setting in the art of reflection and articulation. According to the researcher, nurse educators need to focus more on process-oriented methods of instruction rather than evidence-based curriculum, which focuses on content (Murphy, 2004).

Murphy (2004) believed the results of this study would play a role in how nursing education was conducted. Nursing students should reflect on clinical practice and articulate their reflection through journal writing and/or oral dialogue. Nurse educators should focus on links between clinical practice, and the use of instructional methods that promote expertise rather than academic success. The researcher concluded health care was an ever-changing process that requires nurse educators to place more emphasis on evidence-based, process-oriented teaching and not solely focus on nursing content if a high level of reasoning practitioners were to be produced (Murphy, 2004).

Reflective learning journaling (RLJ) has been used successfully as a teaching strategy with undergraduate and graduate nursing education. In their review of the literature, Langley and Brown (2010) found journaling was a tool for facilitating reflective practice and could be used to connect theory with practice. Their review indicated reflective journaling had been found to be effective in traditional classroom and clinical settings. Research has found journaling built students’ sense of empowerment through personal clarification of opinions, beliefs, and feelings. Journaling has established the groundwork for the development of personal philosophies and codes of ethics. However, the result of prior research was unclear regarding the learning effectiveness of reflective journaling with online classes. It was unclear if results would be comparable with online educational classes.
The purpose of this study was to investigate the perceptions of graduate nursing students and faculty to using reflective journaling in online education (Langley & Brown, 2010). The study used a convenience sample of 32 students and 5 faculty enrolled in an online curriculum development course at a large southeastern public university. Student participants were largely female (96%), over age 41, over 20 years of nursing experience, and currently employed at the university. The student participants were Caucasian (78%), African-American (12%), and other diverse ethnic backgrounds. Langley and Brown (2010) stated the sample was consistent with characteristics of adult learners in respect to: academic degrees; extensive life and work experience; and limited practice with reflective writing.

The researchers informed the participants of the purpose, goals, and benefits of reflective learning journals as a learning strategy. Resources for journal writing were made available, approaches to journaling suggested, and a criterion for evaluation provided. However, specific examples were excluded to eliminate students’ thinking, such as this is the ‘only way’ or the ‘right way’ to journal. A minimum of one journal entry per week was expected of students, which also included their reflections on required readings. Students submitted their journals at midterm and end of the term, as journals made up 10% of students’ course grade. Student participation in this study was 62%, and consent to participate was formalized by an anonymous electronic survey. The faculty who used journaling as a teaching strategy were invited to participate in a faculty version of the survey. The five faculty members who participated were all Caucasian women, older than 51 years and more than 20 years of teaching experience (Langley & Brown, 2010).
Langley and Brown (2010) reviewed nursing and education literature for information related to the development and existence of learning outcomes for reflective journaling. Once identified, the outcomes were organized into four categories: professional development, personal growth, empowerment, and facilitation of the learning process. Graduate student and faculty perceptions were examined by using a 37 item instrument based on themes found in the reviewed literature. Participants were asked to rate the items based on a four-point Likert scale: strongly agree, agree, disagree, and strongly disagree. Validity of the instrument was not assessed, as the instrument had not previously been tested. However, content validity was assessed by faculty who had experience with the use of online reflective journal writing.

Graduate students who participated in the study reported a positive experience with reflective journaling, and felt a new awareness of self, as well as the ability to view problems from other perspectives. The journals allowed faculty to see how students were progressing with regards to their personal development skills, ability to reflect on new ideas, and heightened level of confidence. The researchers stated reflective journaling allowed for the exploration of attitudes; such as self-doubt and fear of exposure. Such findings were consistent with the literature. Analysis of the ratings showed agreement of students (88%) and faculty (80%) that reflective learning journaling strengthened understanding of the role of professional nurse educators. Ninety-one percent of participants agreed journaling helped bridge the gap between theory and practice. Students (88%) and all faculty agreed reflective journaling enabled them to gain new insight into their personal strengths and weaknesses, with 94% of students and all faculty viewing journaling as a positive experience with self-examination of their attitudes and
perspectives. Only 72% of students found journaling a positive response in addressing coping skills or providing them insight with stress management. The students in this study had a more favorable perception of reflective journaling as a vehicle that narrowed the theory-practice gap than the faculty responding to the survey (Langley & Brown, 2010).

Negative ratings were noted with regards to sociopolitical and ethical reasoning being strengthened by reflective journaling; however, students (80%) and faculty (100%) agreed that the creation of personal meaning was strengthened by RLJ. Students and faculty exhibited considerable differences with regards to self-assessment, observation and descriptive skills, and confidence building. There was agreement that reflective learning journaling did reinforce course objectives and helped promote understanding of new information; although, faculty were less favorable with the idea that RLJ assisted with integration and reflection of new ideas. Faculty agreed 100% that reflective learning journaling engaged students as active learners and improved their writing skills (Langley & Brown, 2010).

Langley and Brown (2010) concluded that the results of this study might lead to increased ethical awareness with continued reflective practice necessary to build the confidence needed to entertain complex sociopolitical and ethical issues. Reflective journaling in online education was deemed favorable by both graduate students and faculty and viewed as a worthwhile approach to role model future nurse educators. The researchers concluded since a lack of understanding of purpose, goals, and benefits of reflective journaling can inhibit student motivation to engage in reflection, exploration of methods to help students overcome these obstacles was needed. Overall, this study
revealed that graduate students and faculty perceived positive learning outcomes when using reflective journals in online education.

**Critical Thinking and Reflection**

In the review of the literature, Kennison (2006) found that reflective journaling was often used to gain insight into students’ clinical thinking abilities. In previous research, reflection was established as a teaching strategy to foster critical thinking; however, there has been no tool which could reliably predict the results of this strategy. The literature review further revealed a lack of research linking reflective writing about clinical practice and evaluation of critical thinking (CT). The Critical Thinking Scale (CTS) had been developed as a tool to evaluate the students’ reflective writing, yet inconsistencies in faculty use of the CTS had failed to produce the expected results. The researcher’s purpose for this study was to establish interrater reliability of the Critical Thinking Scale, which if successful would validate the CTS as a reliable tool for nursing educators.

This research was an extension of an earlier pilot test of the CTS. Kennison (2006) used a nonexperimental, descriptive correlational study to address the problem of consistency and fairness in evaluating student nurses’ reflective writing for critical thinking evidence. The convenience sample for the study consisted of all senior nursing students (n=57) enrolled at a small northeastern college during the 1999-2002 classes. The majority of the students were female (n=50). Students’ ages ranged from 20 to 49 with a median age of 25 years. All of the students in the sample were Caucasian and had a nursing grade point average (GPA) of 2.62 to 4.00 with a mean of 3.34.
As mentioned previously, a purpose of this study was to establish interrater reliability of the Critical Thinking Scale (CTS). The CTS is a teacher-accessible tool designed to measure the critical thinking of baccalaureate nursing students as evidenced in their reflective writing about their practice experiences. The reference instrument used to measure critical thinking of students in the study was the California Critical Thinking Skills Test (CCTST). The CCTST is an established benchmark for critical thinking at entry and exit of the nursing program. The CCTST is a 34-item multiple choice test designed to pinpoint cognitive skills of interpretation, analysis, evaluation, inference, and explanation. The researchers cited previous studies which had used the CCTST to measure the CT of students at the beginning and end of their Bachelor of Science in Nursing (BSN) program and to evaluate the relationship between critical thinking skills and clinical judgment of senior BSN students. Data was obtained in the form of reflective writings and CCTST exit scores were obtained (Kennison, 2006).

The methodology used by Kennison (2006) study was to evaluate the CCTST results with CTS results from reflective writings of students and determine if correlations existed. The graduating BSN students took the CCTST in their final week of the semester which provided a standard measure of critical thinking. The graduating BSN students also were asked to write (reflect) about their thoughts, feelings, and happenings about a significant practice experience during their last clinical course in the program. Three teacher raters, each with over 20 years experience in nursing education and critical thinking review of student work, were selected and paid to evaluate the students’ reflective writings for evidence of critical thinking. The three raters were provided one-
on-one and group training to familiarize themselves with the CTS. The three teachers used the CTS to independently evaluate the students’ writing.

Kennison (2006) calculated the interrater reliability of the 57 reflective writing samples to validate the consistent evaluation of each reflective writing sample between the three teachers. A two-tailed Pearson product-moment correlation was used to analyze the relationship between evaluation scores to see if one predicted the other. The results showed a statistically significant range (r = .407 to .702) which indicated the raters produced consistent evaluations. The squared correlation (r²) showed the proportion of variance that was explained by the relationship or strength of the relationship. The interrater reliability of .702 between raters 1 and 3 represented the highest agreement.

To assess the relationship between critical thinking based on the CCTST and mean teacher rating of the baccalaureate nursing students’ reflective writings, a one-tailed Pearson product-moment correlation was used. Results showed a significant positive relationship (r = .233, p< .05), which meant both tests indicated similar evaluations for the critical thinking competency. The r² value was .543 which showed a strong agreement between the test results. Correlations were calculated to determine the relationship of total CCTST, mean teacher rating, age, and GPA. The findings showed a significant relationship (r = 2.33, p < .05) between total CCTST critical thinking score and mean teacher rating. There was also a notable relationship between GPA and CCTST. There were no significant relationships with regards to age, CCTST, and CTS mean teacher rating (Kennison, 2006).

The interrater reliability had been a source of weakness when using the CTS as an evaluation tool. Kennison (2006) explained improvements in the interrater reliability
could result in a stronger correlation between the CCTSC and CST. Once these improvements were realized, the CTS would need to be retested to determine validity measures.

Kennison (2006) cautioned this was a convenience sample from only one institution; therefore, the results might not be generalizable. The researcher also indicated, because of the moderate interrater reliability, there was the need for further tool development. However, the study results indicated the Critical Thinking Scale (CTS) was a potentially valuable tool for the evaluation of critical thinking in nursing programs. The CTS might allow for new or improvements in teaching strategies for the development of critical thinking of students. The researcher suggested the CTS could be used with individual students to determine areas of strength and weakness for remedial development.

Kuiper, Pesut, and Kautz (2009) stated the purpose of the study was to describe research surrounding the theories on research and scholarly activities surrounding the theories and models which were united to evaluate the essential component of clinical reasoning in nursing education. Previous studies had developed evidence which suggested effective and efficient clinical reasoning was a consequence of intentional reflection supported by self-regulation. The researchers believed good thinking habits, which support clinical reasoning, were teachable skills. A student needed to master the cognitive and metacognitive thinking skills that support clinical reasoning. The other goal for the research was to help students ‘think about thinking’ (metacognition) in addition to the language, knowledge, skills, and abilities that support clinical reasoning, clinical decision making, and clinical judgment.
Critical thinking was described as a purposeful self-regulatory judgment that involved a persons’ ability to monitor, evaluate, and reinforce their behavior to achieve a desired goal. Literature confirmed metacognitive (reflective) strategies and patterns of thinking were difficult for novice nurses. The teaching and learning of executive cognitive strategies were the focus of this study (Kuiper et al., 2009).

This study tested the idea that self-regulation of clinical reasoning skills could be developed using the self-regulation theory and the Outcome-Present State-Test (OPT) model. This study used a purposive sample of baccalaureate nursing students from a South Eastern American university in a mid-sized city. The participants were recruited and voluntarily agreed to be included in this study. Clinical experiences occurred in two acute care health care institutions. The patient population consisted of critically ill patients with problems, such as multi-system organ failure, burns, multiple trauma, cardio-pulmonary diseases, and post open-heart surgery. There were 66 study participants ranging from 20 to 52 years of age and ethnicity 64% Caucasian, 35% African-American, and 1% other. The sample was 74% female, 65% single, 52% with no children, 65% with previous degree, 86% with certification, and 47% were Paramedic-BSN graduates (Kuiper et al., 2009).

This study used the quantitative methods of Z scores, percentages, Chi-Square, and t-tests to evaluate the Outcome-Present State-Test (OPT) model of clinical reasoning and nursing language content. The qualitative methods of verbal protocol analysis and content analysis were used to evaluate the reflective journals based on the Self-Regulation Learning (SRL) model to expose metacognitive awareness and thinking strategies. Written consent was collected, all data kept confidential, and results indicated
no impact on student outcomes in the course. All students were required to complete the SRL journals and OPT worksheets as routine course clinical assignments (Kuiper et al., 2009).

The reflective SRL model is a dynamic process that included observations of behaviors and self-regulation of reactions to make self-judgments of competence and areas for improvement for clinical reasoning. Self-regulation training supported the process and development of three kinds of reflection. Content reflection was thinking about the actual experience. Process reflection was thinking how to handle the experience. Premise reflection involves examining long held, socially constructed assumptions, beliefs, and values about the experience or problem. The self-regulatory strategies included monitoring, controlling and regulation of cognition, and academic behavior. Developing reflective thinking fosters self-confidence needed for rapid decision making. According to this model, students can learn to select, evaluate, revise, or abandon cognitive tasks, goals and strategies through internal communication of self-dialogue (Kuiper et al., 2009).

The OPT model provided a structure or blueprint that helps students organize the thinking involved in clinical reasoning. A client’s story is influenced by the nurse’s assessment, framing of the situation, and meaning that is given to signs, symptoms, cues and concepts connected with the patient situation. Once the essential elements of the story are written by the student, the next step in the process is to map out and visually represent the relationships between medical and nursing diagnoses. This blueprint allows the keystone issue to be identified and is the basis for defining the client’s present state, which is contrasted with the desired outcome state. The nursing student can make a
clinical judgment which requires four criteria. The first criteria is to contrast between a present and desired state; second criteria is associated with a desired outcome; third criteria is concurrent considerations of the effects and influence of nursing interventions; and final criteria is a conclusion about outcome achievement and intervention effectiveness. The thinking involved in making clinical judgments involves metacognitive awareness, critical creative, systems and reflective thinking (Kuiper et al., 2009).

The researchers collected data as weekly work sheets derived from the OPT model of clinical reasoning and journals which consisted of responses to the SRL prompts. A scoring system was developed with specific OPT model categories. Each student completed a weekly journal as an independent activity. Using standardized prompts, students were to think and write about whatever came to mind as they read the prompts and to reflect on clinical experiences. The interrate reliability for the prompts ranged from .70 to .90. Students completed assignments for 7-10 weeks to support ongoing development of clinical reasoning skills. The final data point was developed by the researchers as a survey on clinical reasoning and used for the first time in this study (Kuiper et al., 2009).

The results using the OPT rating scale aided the analysis and evaluation of the worksheets to determine clinical and reasoning progress. There were significant correlations between the sub-groups of students and the ability to frame situations over time (Pearson Chi-Square 6.84, p=0.033) and in the ability to make decisions about appropriate interventions over time (9.882, p=0.007). The researchers concluded the concept of framing was the most challenging for students to master. However, this
concept might be a key ability to assist novices to identify the larger picture and sort thorough data (Kuiper et al., 2009).

The researchers also created a clinical reasoning survey based on the thinking and reasoning elements represented in the OPT model. Used for the first time in this study, the survey consisted of 61 items grouped into sections representing the story, keystone issue, reflection, OPT model, testing, foaming, decisions and judgments of the model. The items were scaled on a Likert-type inventory which ranged from strongly disagree to strongly agree to reveal changed observations of clinical reasoning as a result of OPT model use. The results revealed significant pre to post test differences. According to the researchers, this was an implication that increased self-efficacy with clinical reasoning activities occurred over time with these students (Kuiper et al., 2009).

Kuiper et al. (2009) stated an essential component of the clinical reasoning process was the knowledge of nursing language used by the student. Evaluating nursing knowledge classifications system of NANDA-I, NIC and NOC system (NNN) language provided the content or clinical vocabulary. Students’ choice of nursing language provides insight to the reasoning about nursing diagnoses, interventions and outcomes. Results showed students stated the priority keystone problem in appropriate NANDA-I format 92% of the time. Nursing outcomes contrasted with NANDA-I diagnoses were in the correct NOC language 22% of the time, and implied in other language 72% of the time. Interventions were related to NANDA diagnoses in NIC language 61% of the time and implied in other language 39% of the time. Those students who consistently used NNN language with OPT clinical reasoning worksheets were also evaluated to be safe
practitioners by their instructors. There was no evidence that they had better clinical reasoning skills. The researchers concluded this finding required further investigation.

Kuiper et al. (2009) evaluated the Self-Regulation Learning (SRL) to discover the acquisition of clinical reasoning skills. Verbal protocol techniques are used for tracing and explaining the decision making process. According to the researchers, verbal protocol analysis (VPA) was an excellent method for investigating the decision making processes and could be divided in two components; concurrent and retrospective. Information was gathered in concurrent VPA about cue stimuli, product associations, and terminology used. VPA was the method used to examine the nature of thinking and reasoning based on statements subjects use during decision making processes to enable predictions about problem solving. Three criteria had to be satisfied if the verbal data was denoted underlying cognitive processes; relevance, consistency, and memory.

Retrospective verbal protocol analysis (RVPA) was the method used to examine the nature of students’ reasoning based on the words they used to record reflections. The journals were analyzed over a 6 month period of time using RVPA. Results showed most reflections were related to thinking strategies, environmental situations, and self-monitoring of performance. SRL strategies, coupled with the OPT model, suggested benefits of self-observation and self-monitoring during clinical reasoning activities. Areas were identified where guidance was needed for the development of cognitive and metacognitive awareness and clinical reasoning (Kuiper et al., 2009).

Kuiper et al. (2009) agreed the results supported a framework for effective teaching and learning methods to promote and document learner progress in mastering clinical reasoning skills. The researchers’ consistent use and attention to SRL strategies
and processes were likely to support new graduate nurses as they discriminate between the complexities and uncertainties of patient care situation, and learn to prioritize care, and make effective decisions. The OPT model had been shown to assist the development of clinical reasoning in students in psychiatric-mental health experiences, tested as a debriefing method following with human patient simulation, and as a measure of clinical reasoning as students use personal digital assistants at the point of care.

The researchers concluded educators who promote the combined use of the OPT model and reflective SRL strategies would assist students to use a framework that attends to structure, process, and outcomes for clinical reasoning. This framework supported and reinforced student thinking about patient outcomes, the adequacy of self-judgment and skill competence and the environmental issues that impact performance (Kuiper et al., 2009).

Demand for nurses is outpacing the supply due to the delay of professional education systems ability to prepare nurses and a shortage of nurse faculty to teach them. In an attempt to meet this demand, nurse educators are designing clinical experiences where student can practice independent metacognitive thinking strategies, or reflection on thinking, during clinical decision making. Kuiper, Murdock, and Grant (2010) evaluated the differences in thinking strategies by nursing students as a result of increasing student nurses practicum from 60 to 120 clinical hours, coupled with reflective journaling.

Kuiper et al. (2010) literature review showed the use of the practicum model, historically referred to as a preceptorship, started in nursing education more than 30 years ago. A previous study of a change from 5 week to 17 week showed 56% of programs supported precepted clinical experiences and 44% found no difference over traditional
clinical experiences in the areas of critical thinking, competence, and pass rate on NCLEX-RN exam. Another study found synthesis experience was valuable; however, a concern was the lack of control over hindering factors, such as provision of adequate experiences, too many learners in the units, and quality preceptor role models. The researchers also reviewed a study that found reflective journaling to be a powerful way to assess personal growth, as evidence for curriculum development and to show the interdependence of social, interpersonal, and professional-technological nurse characteristics.

The theoretical framework used by Kuiper et al. (2010) was the SRL model. The model was used to design the journaling prompts and as a guide for data analysis. The SRL has three components: behavior, environmental, and metacognitive. The behavior component of the model includes the intentional use of self-monitoring, self-observation, self-judgment, and self-reaction strategies. The environmental component involved structuring the environment for thinking through problems. The metacognitive component used self-evaluation strategies and correction of goals supported by self-efficacy, knowledge work, and thinking strategies. Reflection supported SRL, which supported concurrent and iterative thinking about the situation at hand. In theory, training self-regulation was likely to improve metacognitive thinking strategies that enhanced clinical decision making and supported development of competence in practice.

The researchers utilized data from clinical experiences which occurred in a tertiary level-two trauma facility in a community hospital from the southeaster region of the United States. Twenty-six baccalaureate student nurses from a group of 60 in two senior-level adult health courses volunteered to participate during two separate academic
semesters. The demographic data of the two samples had the following characteristics; average age of 23 years, mostly white women, worked in health care for approximately 3 years, course load of 14-15 credit hours per semester, and a GPA from 2.3 to 3.7 (mean=3.10 to 3.39). The researcher explained the study to students, clinical faculty, and obtained volunteers. A descriptive design was used to compare and contrast weekly reflective journals entries. The journaling was an independent activity which students were to think and write about whatever came to mind as they read prompts on their clinical experiences (Kuiper et al., 2010).

Kuiper et al. (2010) used reflective verbal protocol analysis (RVPA) to examine the nature of thinking and reasoning of the participants. Reflective journaling of the student narratives to reveal self-regulated thinking processes used for problem solving. Three criteria were evaluated to ensure the journal data supported the underlying cognitive processes of relevance, consistency, and memory. The practicum experiences were 60 hours for the first semester participants and 120 hours for the second semester participants. Both semesters clinical assignments occurred during approximately 7 weeks. Ten students were supervised by 1 faculty member and each student then independently adopted a staff nurse’s schedule. The staff nurse provided mentoring and guided the student for all clinical activities.

The researchers noted limitations of the RVPA methodology. With this methodology, procedural data, decision actions, and thoughts can often be reported in a socially desirable fashion to impress the researcher. Memory failure can result in mixed past and present experience occurring at the same time, so that participant’s choices may
be rationalized. However, the analyzing of 7 weeks of journal entries provided a trend in the thought processes for analysis (Kuiper et al., 2010).

The RVPA analysis occurred in a series of steps included: cognitive analysis to identify the extent the model represented in the narratives; referring phrase analysis to identify the vocabulary and focus of concepts; assertional phase analysis to identify the relationships between concepts that made up the epistemology for the domain being studied; and script analysis to identify the strategies used during reflection. The cognitive analysis found that behavioral, metacognitive, and environmental thinking strategies remained consistent during the study. Comparing the 60 and 120 hour practicum groups respectfully: behavioral self-monitoring reasoning strategies 42.4% vs. 32.1%, environmental structuring 35.2% vs. 33.1%, and metacognitive strategies 22.4% vs. 34.8%. The referring phrase analysis used the independent samples $t$ test to discover differences between the 60 and 120 hour practicum groups. The results indicated significant differences for thinking ($t = -14.11, p = 0.000$), environment ($t = 2.86, p = 0.013$), reactions ($t = 2.88, p = 0.013$), time issues ($t = 6.93, p = 0.000$), personnel ($t = -2.60, p = 0.022$), and self-efficacy ($t = -3.14, p = 0.008$) (Kuiper et al., 2010).

The assertional phrase analysis consisted of counting the frequency and percentage of all verbs and coding them according to verb tense. Differences between the 60 and 120 hour practicum groups showed the 60 hour group mostly used past tense verbs (57%) which indicated they relied on previously learned knowledge. In contrast, the 120 hour group used present and future tense verbs (62%) revealing a greater attention to current state information and forward reasoning. Another step of the assertional phrase analysis was to determine the type of statements used; indicative,
connotative, causal, and/or comparative statements. Indicative and connotative were considered lower-level thinking, while causal and comparative were considered higher-level thinking. Utilizing $t$-test to discover the differences between the groups showed the 60 hour group used more connotative statements ($t = 5.70, p = 0.000$), and the 120 hour group used more indicative statements ($t = -2.46, p = 0.028$) (Kuiper et al., 2010).

Script analysis was the final step. The narratives were analyzed for the overall broad descriptions and common themes unique to the data. Narratives were reread and content-analyzed for predominant reasoning processes identified as common to all participants. Interrater agreement between the researcher and faculty evaluating the journals using the SRL model concepts was adequate (Cronbach’s alpha = 0.89). The theme for the 60 hour group was role development and choice of clinical specialty. The 120 hour group themes included reevaluating performance, appropriate use of resources, and strategies for self-correction (Kuiper et al., 2010).

The researchers’ analysis concluded some important considerations for faculty planning practicum experiences. The students’ perception was that clinical competence was enhanced with the structured clinical experiences. Support of metacognitive self-evaluation was promoted through SRL journaling. Self-evaluation and self-efficacy were quantitatively higher in the 120 hour practicum group. Critical analysis of current situation and futuristic reasoning was greater in the 120 hour practicum group. Finally, comparative statements increased in the 120 group. The researchers concluded this finding showed the value of practicum experiences for students to compare and contrast situations, care plans, and performance (Kuiper et al., 2010).
The script analysis revealed the 60 hour group was concerned with behavioral self-monitoring. The researchers speculated this finding might have been due to the limited time of the students at the clinical site. The increase of practicum hours was attributed to changing the students’ focus to other-focused vs. self-focused. Students in the 120 hour practicum spent more time self-monitoring their ability to use resources and conducting patient interventions. These students focused more on planning care as well as the knowledge work needed to develop and meet patient goals (Kuiper et al., 2010).

Kuiper et al. (2010) cautioned the limitation of this study was transferability of findings. This was a small sample size with purposive sampling and selection from a singular geographical area. Another concern was the inability to control preceptor qualifications. Finally, the question remained whether these programs with practicum requirements actually produce more clinically competent critical thinking and professionally prepared nurses.

Summary

The ability to think critically is widely accepted as an essential skill for the nursing professional. Kuiper et al. (2009) described critical thinking as a purposeful self-regulatory judgment that involves a persons’ ability to monitor, evaluate, and reinforce their behavior to achieve a desired goal. The ability of the nursing educator to evaluate and measure critical thinking skills has been difficult. Shirrell (2008) found standardized tests had been used for evaluation critical thinking skills. However, the accuracy and validity of these standardized tests had been questioned in assessing nursing students.

The Critical Thinking Scale was developed as a teacher-accessible tool designed to measure critical thinking as evidenced in reflective writing (Kennison, 2006). The CTS
has a source of weakness in the interrater reliability. Kennison (2006) explained that improvements in the interrater reliability could result in a more reliable and accessible tool for the nursing educator. The Critical Thinking Scale could assist in creating new or improving existing teaching strategies for the development of critical thinking. This study was a replication of Kennison’s (2006) study.

The literature review was divided into three sections. The first section included studies related to critical thinking skills, identifying learning needs, obstacles to overcome for skill development, assessing critical thinking skills, and predicting student success. The findings of this section included: focused reflection and articulation does enhance clinical reasoning (Murphy, 2004); identified five obstacles of critical thinking (Mangena & Chabeli, 2005); 25% of new nurses were deficient in critical thinking ability, problem recognition, reporting of clinical data, and making nursing judgments (Fero et al., 2009); and critical thinking was key to success in nursing practice (Shirrell, 2008).

The second section included studies related to reflective writing, impact on decision making, perceptions of journaling, and use as a teaching strategy. The findings of this section included: decision making abilities were influenced by encounters with the patient, tutor, and nurse (Baxter & Rideout, 2006); journaling facilitates reflection which connects theory with practice (Langley & Brown, 2010); and articulation of focused reflection promotes clinical reasoning (Murphy, 2004).

The third section reviewed studies focused on critical thinking and reflection, promoting reasoning skills, and learning strategies. The findings of this section included: promoting reflective self-regulating learning strategy will improve students’ clinical
reasoning and reinforced student thinking about patient outcomes, adequacy of self-judgment, skill competence (Kuiper et al., 2009); and self-regulated learning journaling is an effective strategy which supports metacognitive self-evaluation for students to compare and contrast situations, care plans, and performance (Kuiper et al., 2010).
Chapter III

Methodology

Introduction

The development of critical thinking skills is important for the nursing professional. The ability to identify and assess a medical situation, then develop and implement a strategy to achieve success, relies on the critical thinking skills developed in the individual (Oja, 2010). The educational institutions for nursing have a common theme; to prepare nursing graduates with the skills needed to be successful. New nurses are exposed to increasingly demanding and complex environment that require the ability to think critically to provide quality patient care (Kautz, Kuiper, Pesut, Knight-Brown, & Daneker, 2005).

Educational institutions use varying teaching strategies to develop and improve critical thinking skill. However, the ability to measure the developed critical thinking has been difficult and unreliable. The Critical Thinking Scale was developed as a teacher-accessible tool for evaluating the data of students’ reflective writing about practice experiences during the course of a nursing program (Kennison, 2006). The tool has been refined; however, the variability induced by individual raters has reduced the
effectiveness of the tool. The purpose of this study was to establish interrater reliability of the Critical Thinking Scale (CTS), a teacher-accessible tool designed to measure the critical thinking of baccalaureate nursing students as evidenced in their reflective writing about their practice experiences. This study is a replication of Kennison’s (2006) study.

Research Question

Are there interrelationships between critical thinking and teacher rating with the Critical Thinking Scale (CTS)?

Population, Sample, and Setting

The population for this study will include all baccalaureate nursing students in their final week before graduating from a mid-west nursing college (N=50).

Protection of Human Subjects

Permission for the study to be conducted will be obtained from Ball State University’s Institutional Review Board and the participating college’s Institutional Review Board. Ethical standards for the research will be maintained throughout the study. Participation will be voluntary and not affect the students’ grades. The written evaluations and California Critical Thinking Skills Test scores will be maintained confidential and will be coded with names deleted. Raters will only have access to the written description.

Procedures

Baccalaureate nursing students will be asked to complete a written description of their thoughts, feelings, and happenings about a significant practice experience. At the same time, the population will take the California Critical Thinking Skills Test exit exam.
The written descriptions will be obtained during the final week of the baccalaureate nursing program and will be collected by the researcher. These documents will be controlled, coded, and names removed prior to delivery to the raters. Once the raters have completed their evaluation, then the researcher will collect the written descriptions and evaluations for data analysis. The California Critical Thinking Skills Test scores will be obtained and coded by the researcher for cross referring and data analysis.

The California Critical Thinking Skills Test will establish an excepted reference point for the evaluation. The written examples will be collected and then given to 3 previously selected raters. These raters will independently evaluate the students writing using the Critical Thinking Scale for evidence of critical thinking.

Design

This study will be a nonexperimental, descriptive, correlational design to explore the interrelationship between the variables of critical thinking and teacher rating with the Critical Thinking Scale. The descriptive, correlational design allows the study to focus on the relationship of the study variables without manipulation of the situation. This study can examine variables that have previously occurred or as in this study is occurring during the study. This study is a replication of Kennison’s (2006) study.

Instrumentation

The California Critical Thinking Skills Test is a 34 item multiple-choice test that targets the cognitive skills of interpretation, analysis, evaluation, inference, and explanation. Along with the Watson-Glaser Critical Thinking Appraisal, it is a benchmark for critical thinking at entry and exit of a nursing program (Kennison, 2006).
**Intended Method for Data Analysis**

Statistical data analysis will be used to determine various relationships. The Pearson Correlation will be calculated to determine the interrater variability. The relationship between the total critical thinking as determined by the California Critical Thinking Skill Test and the raters rating using the Critical Thinking Scale will also be evaluated with the Pearson Correlation.

**Summary**

The methodology and procedures for this study are described in this chapter. The study replicates Kennison’s 2006 study and will investigate the interrelationships between critical thinking and teacher rating with the Critical Thinking Scale (CTS).

The interrater reliability is a source of weakness when using the CTS as an evaluation tool. Kennison (2006) explained that improvements in the interrater reliability could result in a stronger correlation between the California Critical Thinking Skills Test and Critical Thinking Scale. Once these improvements are realized, then the Critical Thinking Scale will be a reliable and accessible tool for the nursing educator. The Critical Thinking Scale could assist in creating new or improving existing teaching strategies for the development of critical thinking. The Critical Thinking Scale could also be used with individual students to determine areas of strength and weakness for remedial development.
References


