Exploring the Relationship of Structural Empowerment and Critical Thinking in Student Nurses’ Learning Environment

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Abstract

The importance of developing critical thinking skills in pre-licensure nursing students is commonly recognized. Critical thinking skills are crucial in nurses’ ability to process information, problem solve and make clinical judgements. Empowered nurses are better equipped to make decisions, take action, perform under pressure, and work through dilemmas than nurses who do not experience empowerment. The Institute of Medicine in a hallmark paper [1] declared that the quality of patient care is directly associated with the degree to which nurses are empowered to act in their patients’ behalf.

Nurses are patient safety advocates. They are vital in prevention of medication and procedural errors, reducing nosocomial infections, and spending more time with patients than any other caregiver in today’s hospitals. Nurses’ empowerment is critical to the future of not only the nursing profession, but the stability of the overall health care system. If new nurses are to succeed in this increasingly complex health care system, nursing education needs to create and maintain an empowered learning environment so that a graduate nurse will be strong enough to act in the patient’s best interests. An empowering learning environment allows critical thinking to thrive. Consider that an empowering learning environment must first explore the perspectives of nursing students’ themselves. This study examined student nurses’ perceptions of empowerment and these perceptions’ relationship with critical thinking performance as measured by the Health Sciences Reasoning Test. Because prior health care experience may influence critical thinking, one year or more experience was included as a covariate.

Background

Empowerment

An environment that creates a sense of empowerment is more likely to promote personal and professional growth. An assumption is that, if student nurses’ learning environment engenders a sense of empowerment, students are: more likely to grow personally and professionally, and more likely to practice with confidence, competence, and autonomy. As Laschinger and many others have established in seminal research on application of Kanter’s theory to working nurses, staff nurse and nurse manager perceptions of structural empowerment are positively correlated with job satisfaction, productivity, organizational commitment, intent to stay, quality of care, patient safety, and several other desirable work and personal behaviors [2, 3, 4, 5, 6, 7, 8]. These relationships have been well-documented in hospital nurse settings over many years. However, the structural empowerment theory has been under-studied in the student nurse education setting.

The current study proposes that student nurses within their learning environment are analogous to hospital nurses within their work environment. If certain characteristics of a work environment promote positive work outcomes, then it is deduced that certain characteristics of a learning environment can promote positive learning outcomes. One of these positive learning outcomes is critical thinking, the dependent variable in this research. Nurses must be critical thinkers. Students must learn to “think like a nurse.”

Structural Empowerment Theory

Structural empowerment within the work environment is operationalized by Kanter’s theory as: 1) access to information; 2) access to resources; 3) support for the work; and, 4) opportunity for growth and development [9]. Kanter’s theory has been tested over and over again with working registered nurses.

Kanter’s first construct, information, refers to the technical knowledge and expertise required to function effectively in one’s position, as well as awareness of what goes on in the larger organization. The second, access to resources, means having the necessary tools, channels, and processes to effectively accomplish one’s work. Access to opportunity, the third construct, refers to the chance not only to advance and be promoted but also to learn and grow personally and professionally. The fourth construct is support: the ability to make decisions, and to also be encouraged, receiving constructive feedback about one’s activities. Kanter defines structural empowerment as being outside the individual, i.e. in the environment and affecting the individual [9]. Kanter also theorized that both formal and informal power within the organization can facilitate empowerment. Kanter developed an instrument to measure structural empowerment called the Conditions of Work Effectiveness Questionnaire (CWEQ). In the mid-1990’s, Laschinger et al (1993) added the Job Activities Scale (JAS) and the Organizational Relationships Scale (ORS) to the CWEQ to further explore perceptions of formal and informal power among nurses [10, 11]. Siu et al. (2005) adapted the CWEQ for assessing students, entitling...
Making it more applicable to the student environment. See Appendix A. Perception of power in the learning environment may
be experienced differently so Siu et al. condensed the JAS and ORS, making it more applicable to the student environment.

### Structural Empowerment and Student Nurses

An extremely small amount of published research has been conducted concerning structural empowerment of nursing students; several thorough paper presentations and dissertation studies are available regarding the topic. Kanter’s theory has potential applications to nursing education settings. There have been no research publications since 2005. Siu et al. (2005) tested the theory by comparing differences in nursing students’ perceptions of structural and psychological empowerment between a problem-based (PBL) and a conventional lecture learning (CLL) program. Analysis of data collected with the Conditions of Learning Effectiveness Questionnaire (CLEQ) showed that students in the PBL program perceived their learning environment to be more structurally empowering and psychologically empowering than students in the CLL program [12].

In a dissertation, Livsey (2007) examined 1) student perceptions of structural empowerment in the clinical learning environment; 2) student self-efficacy; 3) student perceptions of nursing leadership provided by clinical faculty; and, 4) self-reported professional nursing practice behaviors. A path analysis was done to test the model, which proposed that “self-efficacy mediates the relationship between structural empowerment and professional practice behaviors, and that the presence of nursing leadership moderates the strength of the relationships between the other variables” (p. 52) [13]. Livsey’s study found a direct relationship between student perceptions of structural empowerment in the clinical learning environment and self-reported professional nursing practice behaviors.

Beauvais et al. (2014) [14] studied graduate level nurses and found significant relationships between total emotional intelligence, resilience, and psychological empowerment and academic success. Psychological empowerment (intrinsic) is slightly different from structural empowerment (extrinsic), but the finding of psychological empowerment being related to academic success strengthens a hypothesis of structural empowerment being related to critical thinking.

### Critical Thinking

Critical thinking is acknowledged as a vital component to nursing practice. Nurses are decision-makers for patient care. They must constantly recognize, interpret and synthesize new and rapidly changing information about their clients, making decisions about interventions, consultations of other disciplines, and evaluation of outcomes. These are fundamental skills required of nurses that have not changed over time.

The definition of critical thinking varies. The American Philosophical Association defined critical thinking as “purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (p. 3) [15]. This definition is what informs this study. It has guided other studies as well. Pitt et. al (2015) studied entry and exit critical thinking scores of nursing students enrolled in a three-year bachelor of nursing program in Australia, exploring entry critical thinking scores in relation to demographic characteristics, students’ performance and progression through the program. It found that entry critical thinking scores significantly correlated to academic performance and predicted students’ risk of course failure and ability to complete timely progression through the program. Students also had a significant increase in critical thinking scores from entry to exit of the three-year program [16]. The purpose of the current study was to explore students’ perceptions of structural empowerment within their learning environment and determine how these correlates with levels of critical thinking.

There is no research published about the relationship between structural empowerment in the learning environment and critical thinking. It is imperative to study the learning environment of nursing students because this is where foundations are built. Educators need to be aware of tested relationships among factors in the learning environment so that improvements can be made. Critical thinking is an important outcome for nursing programs. The learning environment is important and can be modified, once they are assessed.

### Methods

Institutional Review Board approval was obtained. Fifty-three (53) pre-licensure nursing students first took the Conditions of Learning Effectiveness (CLEQ) survey, then took an exam measuring critical thinking called the Health Sciences Reasoning Test (HSRT) from Insight Assessment (www.insightassessment.com). This exam was purchased through a Middle Tennessee State University grant (Murfreesboro, Tennessee, USA). Permission to use the CLEQ was obtained from Dr. Heather K. Laschinger. The CLEQ items were inserted into Survey Monkey, and a link to the survey, with instructions, sent to potential participants. The instructions included notification to the participant that completion of the survey indicated informed consent.

### Sample

Convenience sampling was used. The study population was baccalaureate nursing students in traditional pre-licensure, nursing programs in the United States. The schools from which to contact participants were identified from the publically available online list of schools that are accredited by the American Association of Colleges of Nursing - Commission on Collegiate Nursing Education (http://www.aacn.nche.edu). Once the email soliciting participation was received by the deans/directors, they decided whether or not to distribute the surveys to their students. If they did send the email regarding this research invitation on to their students, the students then chose whether or not to participate. Schools were not included in the sample if they were post-licensure baccalaureate, associate degree, or distance learning programs. Students who did participate received a certificate of completion for the CLEQ and a personal copy of their HSRT results from Insight Assessment.

### Measures

#### Structural empowerment

The CLEQ is rated on a 5-point Likert scale. An overall measure of structural empowerment is obtained by summing the mean subscale scores. The CWEQ has long established reliability and validity over two decades of use. The CLEQ in Siu’s study had internal consistency reliability of alpha 0.90 for the PBL group and 0.91 for the CL group [12]. The CLEQ in Livsey’s study had a Cronbach’s alpha reliability of 0.942 [13]. The CLEQ in the current study had a Cronbach’s alpha reliability of 0.88 for the 53 participants.
Critical thinking

The HSRT is in the family of critical thinking tests [17]. For use with health sciences students and professional practitioners in health sciences fields, the HSRT is a validated tool. There is a version for practicing professionals and a version for students. Questions are stated in a health sciences context, which is mainly what distinguishes it from generic critical thinking tests. Any specialized information needed to respond correctly is provided in the question itself. There are 33 multiple-choice questions from 5 critical-thinking domains categorized to match the constructs of the American Philosophical Association Delphi Consensus Definition of critical thinking: analysis, inference, evaluation, induction, and deduction. It usually takes 50 minutes to take the test. Internal reliability estimates ranges from .77 to .84. The instrument has been in use since 1994 and more widely since 2006 [17]. Total scores can be overall or percentile. The current study used percentile scores.

Covariates

Covariates in the learning environment that could possibly be related to critical thinking were also collected so that they could be controlled for. See Table 1 for study variables. The covariate of prior health care experience will also be discussed in detail in the Results and Discussion sections because there was a significant correlation found between it and critical thinking.

Results

Demographics

Data were analyzed using SPSS Version 23. All of the participants were in the United States. The majority came from Tennessee (24, 45.4%) and Pennsylvania (12, 22.6%); these two states combined represented 36 of the 53 sample size (68%). Other students came from: California, Georgia, Indiana, Iowa, Michigan, Missouri, North Carolina, New York, and Wisconsin. The breakdown of gender was 5 male participants (9.4%) and 48 females (90.6%). Table 2 shows the original age categories. The largest frequency is for the age group 21 – 29: 36 participants (67.9%). Table 3 shows the modified age categories created in order to run post hoc tests. The largest frequency is for the age category 18 – 29 (69.8%). 86.8% of the sample was Caucasian/White, 5.7 were African American/Black, 3.8% were Hispanic/Mexican, and 1.9% chose not to answer.

Semester level and GPA were collected as demographics so that they also could be controlled. The most frequent semester was third, followed by fifth and then fourth semesters. This indicates that the sample was comprised of more advanced nursing students (83%) rather than early/new students (17%). Participants displayed high GPAs with 98.1% possessing a self-reported GPA of 3.1 and greater. Whether or not the student had at least one year of prior health care experience was: 69.8% (37 students) of the sample had experience; 30.2% (16 students) did not.

To investigate whether GPA and gender were related, the GPA groups were recoded into highest GPA group (3.6 and above) and all others (below 3.6). Chi-squared (X^2) reflected no significant difference between gender and GPA. Likewise, there was no significant difference between highest GPA and healthcare experience. These factors were explored to establish that the groups were equivalent with regard to these characteristics.

Structural empowerment means

The participants perceived moderate structural empowerment within their learning environment, as shown in Table 4. All means were over 3.0 which indicates that the participants perceived “some” presence of the factor (4 “quite a bit” and 5 “a lot”). Independent samples t-tests (parametric test) and Kruskal-Wallis (nonparametric test) showed no significant differences between gender, ethnicity, age, semester level in the program, GPA, or healthcare experience, and empowerment means. A forced entry multiple regression technique was used to further test the demographic variables’ influence on empowerment, and it was not significant.

Critical thinking means

Distribution of the HSRT mean scores are seen in Table 5. Mean score was 59.96 for 53 participants. The distribution of these 53 participants is normal but multi-modal (Figure 1). The kurtosis value of this curve is -1.17, which is acceptable. The skewness is -.37, which is excellent.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level of Measurement</th>
<th>Type</th>
<th>Operational definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceptions of structural empowerment</td>
<td>Continuous. Summed Scales</td>
<td>Independent (predictor)</td>
<td>Access to information, access to resources, support for the work/learning, opportunity for growth and development (CLEQ)</td>
</tr>
<tr>
<td>Level of critical thinking</td>
<td>Continuous.</td>
<td>Dependent (outcome)</td>
<td>Health science reasoning: analysis and interpretation; inference; evaluation and reasoning; inductive reasoning; and, deductive reasoning. Percentile score on HSRT that combines all these dimensions.</td>
</tr>
<tr>
<td>Age</td>
<td>Both Continuous and Categorical</td>
<td>Covariate</td>
<td>Year brackets</td>
</tr>
<tr>
<td>Gender</td>
<td>Dichotomous</td>
<td>Covariate</td>
<td>Male/Female</td>
</tr>
</tbody>
</table>
| Ethnicity                 | Categorical          | Covariate | 1. American Indian, Native American  
2. Asian, Asian American, Pacific Islander  
3. Black, African American  
4. White, Caucasian, Anglo-American  
5. Hispanic, Latino, Mexican American  
6. Other  
7. Prefer not to answer |
| Reported GPA              | Categorical. Grouped. | Covariate | College cumulative GPA, not just nursing GPA as reported by student participant |
| Semester in program       | Continuous            | Covariate | 1st semester, 2nd semester, 3rd semester, 4th semester, 5th semester (of Nursing program) |
| At least one year healthcare experience | Dichotomous          | Covariate | This will be up to the participant to determine what is/what is not, health-care experience, either Yes or No |

Table 1: Study Variables
The regression equation for this model is $Y = 6.108S + 22.326HE$. Healthcare experience ($b = .350, p = .010$) contributed strongest to the dependent variable of HSRT, followed by semester ($b = .264, p = .048$). All assumptions are met. There is definitely an inverse relationship between healthcare experience and critical thinking.

**Structural empowerment and critical thinking**

The subscale of *information* was not significantly related to critical thinking and accounts for little variance (8.7%). Step-wise regression was used entering all covariates into block 1 and the information mean in block 2. These participants showed a moderate degree of access to *information*, but it was not associated with higher critical thinking scores.

Using the same method and entering in the *resources* subscale into block 2, the subscales of *resources* was not significantly related to critical thinking and accounted for little variance. These participants showed

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### Table 2: Distribution original age categories before recategorized from 5 to 3 categories

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 20</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>21 - 29</td>
<td>36</td>
<td>67.9</td>
</tr>
<tr>
<td>30 - 39</td>
<td>8</td>
<td>15.1</td>
</tr>
<tr>
<td>40 - 49</td>
<td>7</td>
<td>13.2</td>
</tr>
<tr>
<td>50 - 59</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>53</td>
<td>100</td>
</tr>
</tbody>
</table>

### Table 3: Distribution of age categories after recategorized from 5 to 3 categories

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 29</td>
<td>37</td>
<td>69.8</td>
</tr>
<tr>
<td>30 - 39</td>
<td>8</td>
<td>15.1</td>
</tr>
<tr>
<td>40 - 59</td>
<td>8</td>
<td>15.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>53</td>
<td>100</td>
</tr>
</tbody>
</table>

### Table 4: Summed means, subscales of perceived structural empowerment (N = 53)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>3.75</td>
<td>.717</td>
</tr>
<tr>
<td>Opportunity</td>
<td>3.91</td>
<td>.638</td>
</tr>
<tr>
<td>Information</td>
<td>4.16</td>
<td>.624</td>
</tr>
<tr>
<td>Resources</td>
<td>3.63</td>
<td>.656</td>
</tr>
<tr>
<td>Formal/Informal power</td>
<td>3.06</td>
<td>.691</td>
</tr>
</tbody>
</table>

### Table 5: Distribution of HSRT percentile scores

<table>
<thead>
<tr>
<th>HSRT score</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSRT score</td>
<td>53</td>
<td>6.00</td>
<td>99.00</td>
<td>59.96</td>
<td>29.57</td>
</tr>
</tbody>
</table>

Pearson’s $r$ correlation showed no significance between critical thinking and age. Independent samples t-tests showed no significance between critical thinking and gender, nor ethnicity. Kruskal-Wallis test found no significance between critical thinking and GPA group. One-way ANOVA indicated no significance between critical thinking and semester in program.

Table 6 illustrates mean percentile HSRT and healthcare experience. Independent t-tests indicated that the group that *did not have* at least one year of healthcare experience ($M = 73.81, SD = 18.72$) had significantly higher HSRT percentile scores than the group that *did have* at least one year experience in healthcare ($M = 53.97, SD = 11.60$), $t(45.73) = -2.84, p = .007$; Levene’s $=.002$). In other words, the less the experience, the greater the critical thinking score. This finding is counter-intuitive to what one would think.

Using a forced entry method of all 6 demographic variables, Table 7 shows that adjusted $R$ square is .103, which means that 10.3% of the variance in HSRT score is accounted for by these demographic variables. The model, however, was not overall significant. See Table 8.

Table 9 shows the beta coefficients to better illustrate the separate factors. The regression equation for this is: $Y = -8.617G + 21.273HE + 6.692S - 7.614GPA - 1.627E + .569A$. Healthcare experience ($b = .333, p = .019$) contributed strongest to the dependent variable of HSRT, followed by semester ($b = .290, p = .043$). Figure 2, P-P plot, shows a linear regression line, which is very strong for illustration of normality. Figure 3 scatterplot shows that the assumption of homoscedasticity was met as illustrated by equal distribution above and below the horizontal line.

To test another method, stepwise multiple regression entering age, gender, ethnicity, and GPA into the first block, and semester and healthcare experience entered into the second block revealed a significant model $F(2,50) = 4.942, p < .05, p = .011$ as shown in Table 10.

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a moderate degree of access to resources, but it was not associated with higher critical thinking scores.

The subscales of opportunity and of support, however, showed significant relationships with critical thinking. Surprisingly though, they were negative relationships. Support, as illustrated by Pearson r correlation of -.273 (fair strength), was significant at the .05 level (p = .017), followed next by semester in program (b = .315, p = .023), and then opportunity (b = -.286, p = .033). This model is strong and significant for predicting critical thinking.

As done with the support subscale, an additional sub-analysis was done with the opportunity scale to better understand why this inverse relationship with opportunity and critical thinking. Table 12 shows the questions in this subscale: there were two significantly related questions. These were: #5 accomplish learning goals in your own way; #6 share with others what you have learned.

Discussion

The biggest surprise finding was that the participants that did not have at least one year of healthcare experience (M = 73.81, SD = 18.72) had significantly higher critical thinking scores (HSRT percentile scores) than the group that did have at least one year experience in healthcare (M = 53.97, SD = 31.55), t(45.73) = -2.84, p = .007; Levene’s .002). Collecting this demographic was done to control for healthcare experience as a nurse’s aide or tech, thinking that someone with experience might have an advantage over another student and therefore exhibit a higher level of critical thinking. What was found was the exact opposite. This finding suggests that automatically assuming that prior healthcare experience gives a nursing student an advantage may not be correct. It also warrants further research regarding the relationship thinking. See Table 11. Once the covariates of healthcare experience (b = .322, p = .02) and semester in program (b = .267, p = .05) were added into the regression equation, support contributed b = -.250 but was not significant p = .06. Although these findings deserve further research because it was so close to being significant, the support subscale was not significantly related using multivariate methods in this study.

The opportunity subscale had a stronger association than support did, even with the other covariates inserted into the regression equation. The covariate healthcare experience contributes strongest (b = .327, p = .017), followed next by semester in program (b = .315, p = .023), and then opportunity (b = -.286, p = .033). This model is strong and significant for predicting critical thinking.
of healthcare work experience and its role in the proper development of critical thinking ability as a nurse. Perhaps there is a best time to introduce hands on care, i.e. after some theory has been learned.

No studies have examined the relationship between prior healthcare experience and level of critical thinking. When prior healthcare experience was addressed in the literature, it was in terms of predicting success on the NCLEX exam. An older study (1997) looked at whether or not a student was previously licensed as a vocational nurse and found that being such made no significance difference on passing the NCLEX exam [16].

Recently, some nursing schools have changed admission requirements to require potential nursing students to complete nursing assistant certification prior to beginning professional nursing courses. The rationale for this is: 1) the assumption that, after completion of said course, pre-licensure nursing students would have evaluated their own comfort level with providing intimate basic care for patients; and 2) "this is a way to save curricular time by decreasing the amount of time required for the development of basic nursing skills in preliminary nursing courses" (p. 162) [19]. Stombaugh and Judd (2014) chose the dependent variable: confidence. "This does not suggest competency which is a very different concept" (p. 164) [19]. Nursing school programs should not assume that students are prepared in basic nursing care based on a nursing assistant certification. Stombaugh and Judd (2014) acknowledged that additional research is needed to explore work experience beyond a nursing assistant certification for pre-licensure nursing program admission and that self-confidence certainly does not equate to competence. They pointed out that nursing assistant certification programs are outdated and inconsistent from state to state, and that nursing programs who require certification for admission should ask themselves why. "Is it to guarantee a clinical skill set, or is the purpose to develop critical thinking and communication skills?" (p. 165) [19]. The results of the current study suggest that critical thinking is not necessarily enhanced by this kind of experience.

Results from this study show that nursing students perceive that there is little "encouragement to challenge ideas." Admittedly, nursing school is quite rigid. There is much content and so many concepts that students must learn. While nursing faculty might welcome and entertain alternate ideas from students, the requirement of a licensure exam after finishing school before one can become a registered nurse
may squelch creativity of teaching-learning practices. Perhaps a good approach to encourage challenge of ideas is via research and evidence-based practice. When a student is answering this question on the CLEQ survey, they may be thinking of challenging the faculty’s ideas versus questioning what should be best practice and how to impact improvement. Either way, the finding that this item is inversely related to critical thinking prompts the question: are faculty giving the impression to the “brighter students” (i.e. the higher critical thinkers) that their ideas are not of value and have no place in the program?

Admittedly, discovering the inverse relationship of opportunity for learning with critical thinking was disappointing. Why might higher critical thinkers perceive less opportunity? The answer is in the sub-analysis. The two items causing the significant difference were: “accomplishment of learning goals in my own way” and “sharing with others what I have learned.” The coefficients for these were -.320 and -.285 respectively, both significant at p < .05. Again, maybe faculty is not only squelching creativity but maybe also shutting down the brightest students. These findings can be helpful as schools revise curricula, as faculty create and revise course syllabi, and as new faculty are hired and on-boarded. Individual teaching philosophy should always be considered when hiring faculty.

Study Limitations

The results of this study cannot be generalized because nursing students vary from program to program, state to state, and country to country. Structural empowerment was measured with a self-report method, which can be considered by some experts as a limitation. As for the critical thinking test, there is always the possibility that individuals did not do their best. At least this possibility is equal for all participants, however, which eases this limitation.

Another limitation was use of a relatively small convenience sample. A third limitation is being too general in asking the information of what specific type – direct care or not, hospital or not, and what role. Also, knowing if a student had a prior college degree would have been informative as a covariate.

Conclusions

This study demonstrates that it is possible for nursing students to feel moderate structural empowerment within their learning environment. There may be characteristics within a learning environment that are perceived by highly capable students to be disempowering. Three of these are: 1) lack of encouragement to challenge ideas; 2) lack of opportunity to learn in one’s own way; and, 3) lack of opportunity to share one’s learnings.

An important surprise finding in this study sample was that prior healthcare experience was inversely related to critical thinking. Further research is needed in this area to better guide nursing school admission policies and advising of pre-nursing students.

References