

The Effects of Team-Based Learning(TBL) Education on Critical Thinking, Interpersonal Relationships, Self-Leadership and Academic Major Satisfaction

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Abstract : This study was conducted to develop and evaluate the effects of the Team-Based Learning (TBL) education program, in the college course “Theory of Nursing Process, on critical thinking, interpersonal relationships, self-leadership and academic major satisfaction among nursing college students.

The methodology used in this research is an experimental study of a group of pretest-posttest design, which was designed to check for differences before and after the intervention through the TBL education program to the treatment group. The participants in this study are second-grade nursing students at H University in J city, South Korea. From March 24, 2019, to June 15, 2019, the TBL education program was applied to “Theory of Nursing Process” classes for a total of 10 weeks, 2 hours per week. The collected data were analyzed with descriptive statistics and paired t-tests using the SPSS WIN 21.0 Program.

The effects of the TBL educational program on critical thinking ability, interpersonal relationships,

self-leadership and satisfaction toward the nursing major were statistically significant, as follows: critical thinking ability($t=-4.09, p=.000$), interpersonal relationship($t=-3.35, p=.001$), self-leadership ($t=-3.48, p=.001$) and major satisfaction($t=-2.47, p=.016$). The above findings confirm that the application of team-based learning in nursing education can positively affect critical thinking, interpersonal relationships and self-leadership among nursing students, and increase academic major satisfaction. After the intervention of the TBL training program, a correlation between variables was found. Critical thinking and interpersonal skills ($r = .382, p = .002$), critical thinking and self-leadership ($r = .360, p = .003$), critical thinking and major satisfaction ($r = .534, p = .000$), Interpersonal Skills and Self Leadership ($r = .861, p = .000$), Interpersonal Skills and Main Satisfaction ($r = .627, p = .000$), Self Leadership and Main Satisfaction ($r = .654, p = .000$) showed a significant positive correlation.

The results above confirm that applying team-based learning to nursing education can have a positive impact on critical thinking, interpersonal, and self-leadership among nursing students and increase academic satisfaction. It can be seen that critical satisfaction correlates with critical thinking, interpersonal ability, and self-leadership.

Keywords : TBL, Critical Thinking, Interpersonal Relationships, Self-leadership, Academic major, satisfaction.

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1. Introduction

1.1 Need For Research

A major function of universities is to cultivate men of ability with knowledge-based training for satisfying the needs asked in their society. Furthermore, the goal of nursing education is to foster nurses who can deal with complicated and diversified situations by enhancing the ability to make decisions by themselves, and use critical thinking as a tool to solve problems that one may face in the clinical field. To achieve this goal, training nurses' capabilities to perform their duties successfully in the clinical field is the main agenda in education nursing.

Team-based learning (TBL) is an academic instruction strategy for maximizing the performance between an individual and team by promoting interpersonal interaction before learning, and stimulating communication with team members in problematic situations [1]. TBL is an educational methodology to encourage students to learn effectively and enthusiastically by co-working within a small group, especially via team effort and continual individual learning. This method can offset the shortcomings of instructor-led training borne by unilateral knowledge delivery and rote learning [2]. TBL can help students enhance their capabilities within the complicated and diversified clinical field [3].

In this context, "critical thinking" is defined as the ability to think clearly and reasonably about information or opinions, and, if necessary, to seek more advanced opinions or alternatives considering comprehensive context [4]. The need for critical thinking is worth emphasizing in a knowledge-intensive information society. In the Republic of Korea ("South Korea"), the importance of critical thinking in the area of education has increased throughout history. The concept of critical thinking was introduced as a basic refinement in the early 1990s and adopted as an academic liberal art subject in South Korea. The Korean accreditation board of nursing education recommends Critical Thinking as one of the 12 academic fields to study for a bachelor's degree [5].

In this study, "personal relationship" refers to the ability to establish a closer relationship and maintain this interaction [6]. Effective cooperation in personal relationships can contribute to the development of

learning efficacy and social attitude [7]. These days, addiction to the Internet and smart-phones has been known to widen the interpersonal distance. Most courses in nursing colleges in South Korea are instructor-led so that these classes cannot support the development of personal relationships. In such situations, TBL methodology proposes a solution by emphasizing the importance and value of personal relationships, delivering problem-solving oriented lectures, and offering an open environment for forming personal relationships.

This study defines "self-leadership" as the ability to lead or control oneself independently. Such leadership tends to encourage an individual to set goals by stimulating the function of this self-control system, and achieve goals with intrinsic motivation. Therefore, self-leadership can affect team members' attitudes and performance positively [8]. Self-leadership is a key element that team members must have, and as such, relates to TBL, especially on the mechanism of setting common learning objectives with team members and interacting with them to cope with a rapidly changing medical environment, quality nurses can be trained using TBL [9].

In this study, "academic major satisfaction" is a set of outcomes derived by comparing participants' career expectations with their university major. College students asserting higher satisfaction toward their major tend to adapt themselves to college life and life after graduation more effectively [10]. Academic major satisfaction entails a sense of accomplishment in education, which can affect students' academic achievement, peer cooperation in class, and adaptation to different environments. [11]. As such, academic major satisfaction is a significant factor in TBL.

Precedent research on TBL shows that the self-leadership of team members who practice critical thinking is an important factor in raising team performance. Furthermore, TBL with team members' complementary interpersonal interaction shows positive results in their academic major satisfaction.

However, more researches on TBL are needed to prove these previous suggestions. The following factors are considered in existing studies of TBL, especially in nursing science: learner perceptions or academic achievement [12]; participation or satisfaction in the class [13]; academic motivation or attitude [14]; self-directed learning or interpersonal

comprehension [15]; communication skills [16]; and critical thinking and problem-solving skills [17,18]. However, previous research on TBL does not fully address the impact of TBL on critical thinking, interpersonal relationship, self-leadership, and academic major satisfaction.

This experimental research on the influence of TBL on critical thinking, interpersonal relationships, self-leadership, and academic major satisfaction in the college course "Theory of Nursing Process," a foundation subject in the nursing science curriculum, may be used to set up a methodology to lead a successful team learning and create an effective learning strategy.

1.2 Purpose Of Research

The purpose of this research is to investigate the effects of nursing students' TBL education on critical thinking, interpersonal relationship, self-leadership, major satisfaction, such as below;

- After intervention through the TBL educational program, to check the status of critical thinking, interpersonal relationship, self-leadership, major satisfaction,
- After intervention through the TBL educational program, to check the difference of status of critical thinking,
- After intervention through the TBL educational program, to check the difference of status of interpersonal relationship,
- After intervention through the TBL educational program, to check the difference of status of self-leadership,
- After intervention through the TBL educational program, to check the difference of status of major satisfaction, and
- After intervention through the TBL educational program, to check the correlation with critical thinking, interpersonal relationship, self-leadership, and major satisfaction.

2. Research Method

2.1 Research Design

This study is an experimental study of a group of

pretest-posttest designs to identify the effect of nursing course class to which was applied TBL education program on critical thinking, interpersonal relationship, self-leadership, and major satisfaction of nursing students. This study was conducted with students from the Department of Nursing at H University in J, enrolling in second-year nursing courses.

The criteria for selecting study subjects are as follows: students who have no experience in the TBL program; have no physical or mental problems in their participation in education; understand the purpose and methods of this study and agree, and sign up to participate in their research. 70 students agreed to participate in the research, and 64 students, excluding four who did not respond to the post-survey after participating in the research, were included in the final analysis.

Teaching by TBL took place once a week, two hours per session, 10 weeks in total from March 24, 2019, to June 15, 2019. The individual abilities of students, such as interest in the subject, leadership, computer utilization, and presentation skills, were investigated according to the team's survey table; and a team of seven to eight members was formed based on the survey. Before the class, students were given a range of study goals and reading assignments. The individual Readiness Test (IRAT) was presented with six questions of four different criteria for analyzing readiness and understanding based on a given reading task, and the Group Readiness Test (GRAT) was conducted through a group discussion with the same questions. In the case application phase, groups were asked to discuss the case and then present it, the professor supervised the discussion. In the last week of the team-based study, a peer review was initiated to prevent free-rides in team learning.

2.2 Research Tool

2.2.1 Critical thinking

Critical thinking refers to a personal propensity and cognitive driving force for thinking to make decisions on one's own, with a purpose in personal or professional work[19]. To measure critical thinking patterns, a critical thinking attitude measurement tool developed by Yoon Jin [20] was used. The tool consists of five questions of intellectual passion/attention, four questions of prudence, four questions of confidence, three questions of

systematicness, four questions of intellectual fairness, four questions of sound skepticism, and three questions of objectiveness, 27 questions and seven factors in total. It is composed of 5 Likert measures from "Not at all" (1 point) to "very yes" (5 points), and the higher the score, the higher it is likely to do critical thinking.

2.2.2 Interpersonal relationships

Interpersonal relationships are a common psychological tendency of individuals to treat a person, which refers to the relationship between two people who are together and are created by acting dependent on each other in various situations or task solutions [6]. This survey used the measure of friendship between young people modified by Jang[21]. The measure consists of 25 questions and friendship is divided and measured into seven sub-regions. The sub-area consists of satisfaction, sensitivity, trust, communication, understanding, intimacy, and openness. Each question on the questionnaires is required to respond on a 5-point Likert scale, from "Not at all" (1 point) to "very yes" (5 points), and the higher the total score, the more amicable the friendship.

3.2.3 Self-readership

Self-readership is a concept that positively affects personal effectiveness by bringing about behavioral changes in the process of stimulating the fundamental human self-control system and inducing it internally [22]. Based on the questionnaire developed by Prussia et al [23] to measure self-preservation, the five behavioral strategies consists five behavior-oriented questions like "I tend to set goals in doing something," five cognitive strategy question like "I consider various alternatives in doing something," and thinking pattern strategy questions like "I act to solve problems by myself." Each question on the questionnaires is required to respond on a five-point Likert scale, from "Not at all" (1 point) to "Very Yes" (5 points), and the higher the total score, the higher the self-preservation.

2.2.4 Academic major satisfaction

Major satisfaction is the product of a judging process that evaluates the major to which one is currently affiliated [10] compared to the criteria for career or career established by an individual (Ha Hye-sook, 2000). In this study, the score was measured using the Majority Satisfaction Tool developed by

Kim & Ha [24], a total of 16 questions, It is responded by a 5 point Likert scale, from 1 point "Not altogether" to 5 points "very much." meaning that the higher the score, the higher major satisfaction.

2.3 Data Analysis

The target data for this study were analyzed using the SPSS WIN 21.0 program. The collected data were analyzed with descriptive statistics. Paired t-tests and Pearson correlation coefficient were used for the analysis.

3. Results Of The Study

3.1 General characteristics

In general characteristics, the number of female students was 43 (65.2%), the age was 21-24 years old with 56 (84.8%), and the personality was 57 positive(83.4%), motivation to apply was 20 (30.3%), and aptitude was 19 (28.8%)[Table 1].

Table 1 : General characteristics (N=66)

Characteristics		n(%) or M(\pm SD)
Sex	M	23(34.8%)
	F	43(65.2%)
age	20 or less	6(0.9%)
	21-24	56(84.8%)
	over 25	4(0.6%)
Religion	Yes	40(60%)
	No	26(39.4%)
Personality propensity	positive	57(83.4%)
	negative	9(13.6%)
Motive	High school grades	4(0.6%)
	Parent Invitation	20(30.3%)
	Employment rate	11(16.6%)
	aptitude	19(28.8%)
	Profession	8(12.1%)

3.2 Differences in critical thinking, communication ability, self-leadership, and Academic major satisfaction after applying TBL

After intervention through the TBL educational program, the average score of critical thinking ability increased by 7.58 points from 91.02±9.37 before the intervention to 98.59±11.11 after the intervention (t=-4.09,p=.000). That of interpersonal relationships increased by 7.4 points from an average of 90.45 ± 15.16 before intervention to 98.20±12.81 after intervention (t=-3.35,p=.001); self-leadership increased 4.52 points from 54±8.08 before intervention to 58.52 ±7.33 after intervention (t=-3.48,p=.001); major satisfaction increased by 3.64 points from 59.73±9.03 before intervention to 63.36±7.98 after intervention, and the difference was significant (t=-2.47,p=.016). These results indicate that the TBL education program had a meaningful effect on the participants [Table 2].

Table 2: Differences in critical thinking, communication ability, self-leadership and Academic major satisfaction after applying TBL. (N=66)

Variables	Pretest M±SD	Posttest M±SD	Paired Differences M±SD	t	p
Critical thinking	91.02±9.37	98.59±11.11	-7.58±15.05	-4.09	.000***
Interpersonal Relationship	90.45±15.16	98.20±12.81	-7.74±18.80	-3.35	.001***
Self-Leadership	54±8.08	58.52±7.33	-4.52±10.54	-3.48	.001***
Academic Major satisfaction	59.73±9.03	63.36±7.98	-3.64±11.97	-2.47	.016**

unit: cm, ***: p<0.005, **: p<0.05

3.3 Difference of critical thinking after TBL education program(N=66)

After mediation through the TBL educational program, intellectual justice(t=-2.55,p=.013), sound skepticism(t=-2.16,p=.034) and systematicness(t=-3.29,p=.002) showed significant differences. There were no differences in intellectual honesty (t=.888,p=.378), objectivity(t=-.49,p=.625), and confidence(t=-.53,p=.595)[Table 3].

Table 3. Differences of critical thinking after TBL education program (N=66)

Variables	Pretest M±SD	Posttest M±SD	Paired Differences M±SD	t	p
Intellectual fairness	8.15±1.06	7.98±1.03	.17±1.53	.888	.378
prudence	13.14±1.68	13.95±1.89	-.82±2.60	-2.55	.013**
Objectivity	11.60±1.39	11.73±1.51	-.12±2.00	-.49	.625
healthy skepticism	13.70±2.27	14.55±2.36	-.85±3.19	-2.16	.034**
Systematicity	6.08±1.41	6.91±1.46	-.83±2.06	-3.29	.002***
Intellectual eagerness/Curiosity	6.85±1.42	6.88±1.54	-.03±2.05	-.12	.905
Self Confidence	7.20±1.32	7.32±1.22	-.12±1.84	-.534	.595

unit: cm, ***: p<0.005, **: p<0.05

3.4 Difference of Interpersonal Ability after TBL Education Programs

Subareas of interpersonal relationships after intervention through the TBL training program, satisfaction(t=-2.51,p=.015), sensitivity(t=-2.89,p=.005), communication(t=-2.96,p=.004), reliability(t=-2.16,p=.034), openness(t=-3.24,p=.002), comprehension(t=-3.19,p=.002) All showed significant differences[Table 4].

Table 4 : Differences of Interpersonal Ability after TBL education program (N=66)

Variables	Pretest M±SD	Posttest M±SD	Paired Differences M±SD	t	p
satisfaction	14.53±2.85	15.62±2.38	-1.09±3.53	-2.51	.015**
sensitivity	11.29±2.12	12.20±1.73	-.91±2.56	-2.89	.005**
communication	14.44±2.79	15.74±2.34	-1.30±3.57	-2.96	.004***
trust	10.73±2.26	11.5±1.93	-.77±2.90	-2.16	.034**
intimacy	11.05±2.36	11.95±1.83	-.91±2.62	-2.82	.006**
openness	13.97±2.78	15.38±2.49	-1.41±3.53	-3.24	.002***
Understanding	14.45±2.64	15.80±2.21	-1.35±3.44	-3.19	.002***

unit: cm, ***: p<0.005, **: p<0.05

3.5 Difference of self-leadership after TBL Education Programs

Subareas of self-leadership after intervention through the TBL training program, behavioral Strategy(t=-3.25,p=.002), cognitive strategy(t=-2.98,p=.004), all showed significant differences [Table 5].

Table 5. Differences of self-leadership after TBL Education Programs (N=66)

Variables	Pretest M±SD	Posttest M±SD	Paired Differences M±SD	t	p
Behavioral Strategy	32.20±5.39	35.06±4.65	-2.86±7.15	-3.25	.002***
Cognitive strategy	21.80±3.40	23.45±3.41	-1.65±4.50	-2.98	.004***

unit: cm, ***: p<0.005, **: p<0.05

3.6. Correlations among critical thinking, interpersonal relationship, self-leadership, and academic major satisfaction TBL Education Programs

After the intervention of the TBL education program, the correlations among the variables were found. Critical thinking and interpersonal skills(r=382,p=.002), critical thinking and self-leadership(r=.360,p=.003), Critical thinking and major satisfaction(r=.534,p=.000), interpersonal skills and self-leadership(r=.861,p=.000), interpersonal skills and major satisfaction(r=.627,p=.000), self-leadership and major satisfaction(r=.654,p=.000) showed significant positive correlations [Table 6].

Table 6. Correlations among critical thinking, interpersonal relationship, self-leadership and academic major satisfaction

TBL Education Programs (N=66)

Variables	Critical thinking	Interpersonal Relationship	Self-Leadership	Major satisfaction
Critical thinking	1			
Interpersonal Relationship	.382***(.002)	1		
Self-Leadership	.360***(.003)	.861***(.000)	1	
academic Major satisfaction	.534**(.000)	.627***(.000)	.654***(.000)	1

4. Conclusion

This study is progressed to investigate the effects of the TBL education program in the curriculum of the nursing process on critical thinking skills, interpersonal relationships, self-leadership, and major satisfaction. This study’s main discussions are such as below;

First, after intervention through TBL educational program, the average score of critical thinking ability increased by 7.58 points from 91.02 ± 9.37 before the intervention to 98.59 ± 11.11 after the intervention, and the difference was statistically significant ($t = -4.09, p = .000$). This result shows the same result suggested by previous studies [2.25]. Three basic frameworks of critical thinking ability are composed of analysis, inference, and evaluation. TBL’s methodology is the process of problem-solving by individuals’ role allocation considering their prior learning and experience and communication with team members. Repeated these processes tend to enhance critical thinking ability. According to this result, if more TBL education programs are applied in the curriculums for nursing students, these students’ critical thinking ability may be improved so that they can solve problems which they are confronted in the clinical field after graduation actively and reasonably

Second, after intervention through TBL educational program, the average score of interpersonal relationship increased by 7.4 points from an average of 90.45 ± 15.16 before the intervention to 98.20 ± 12.81 after the intervention, and the difference was statistically significant ($t = -3.35, p = .001$). This result shows the same result suggested by previous studies [26.27]. The TBL education program works positively on interpersonal relationships and improves students’ ability in interpersonal relationships, especially in respect and consideration of team members. To improve and increase the usage of the skill of interpersonal

relationships, the TBL education program may be asked to be applied to other courses in the curriculums for nursing students.

Third, after intervention through TBL educational program, the average score of self-leadership increased by 4.52 points from 54 ± 8.08 before the intervention to 58.52 ± 7.33 after the intervention, and the difference was statistically significant ($t = -3.48, p = .001$). This result shows the same result suggested by previous studies [28.29]. Self-leadership acts as a major factor to improve the team’s achievement positively by enhancing the team members’ coordination and effectiveness. To increase the team’s effectiveness by applying TBL education programs, team members are encouraged to present their self-leadership by considering each member’s personal capability during the role assignment process.

Fourth, after intervention through TBL educational program, the average score of major satisfaction increased by 3.64 points from 59.73 ± 9.03 before the intervention to 63.36 ± 7.98 after the intervention, and the difference was statistically significant($t = -2.47, p = .016$). In the process of the TBL education program, more satisfaction of class can be expected whenever team members show higher responsibility for preparing class material before entering the class and activate coworking with other team members. Relating to the TBL education program, the higher level of preparedness of class material can lead out more responsibility toward the team, and be immersed themselves in the class [30]. To increase the satisfaction of class participation during the TBL education program, instructors’ intervention tends to be asked to enhance the team members’ participation equally. Besides, it is asked to consider how to increase the cohesiveness of team members.

By these results, the effect of the TBL education program in the curriculum of the nursing process on the nursing students’ critical thinking ability, interpersonal relationship, self-leadership, and major satisfaction shows positive relations. In the 10-week class, especially in small group team activities, the TBL education program demonstrates the effectiveness of this program by preparing for classes, as well as a great teaching-learning method for improving students’ critical thinking skills, interpersonal relationships, self-leadership, and major satisfaction.

However, this study is carried out by a single case experiment with one university nursing student so that the result of this study is limited, especially in comparison with the control group or other teaching methods.

5. Conclusion And Suggestion

This study involved one university nursing student with applying the TBL education program in the nursing process class for 2 hours per week, 10 weeks in total. This study researched the effect of the TBL education program on critical thinking ability, interpersonal relationship, self-leadership, and major satisfaction.

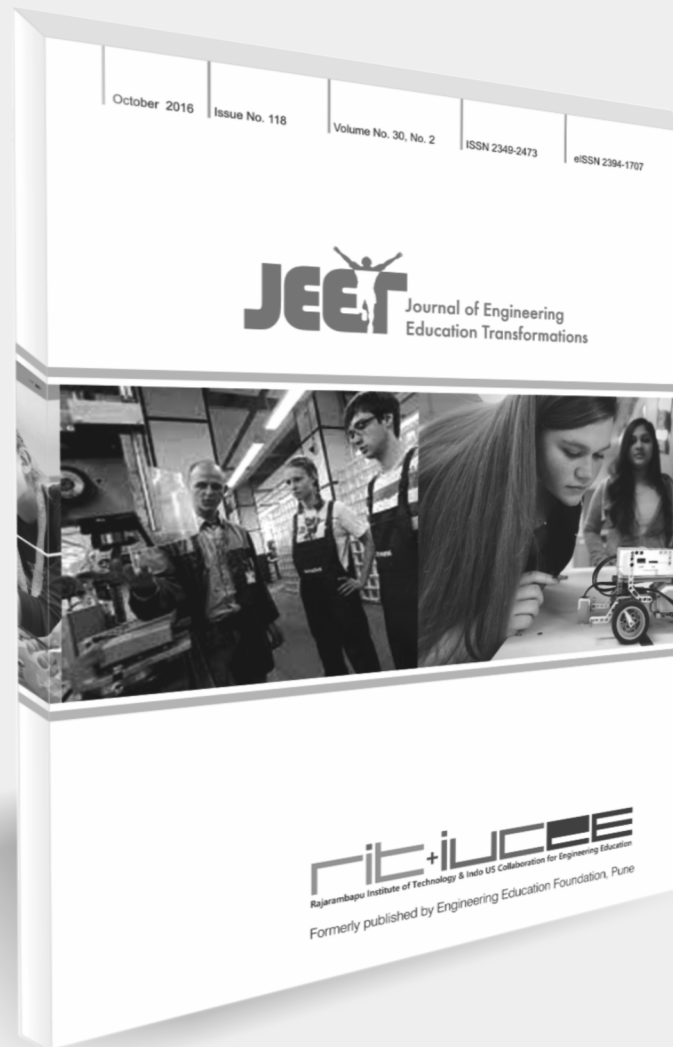
In this research, after intervention through TBL education program in the nursing process, the status of nursing students' critical thinking ability, interpersonal relationship, self-leadership, and major satisfaction shows a positive result. By these results, it is suggested to expand the TBL education program in nursing education for raising nurses' capability.

Other researches are asked to clarify the effect of the TBL education program by preparing long term experimental designs, comparing the difference with the control group, or expanding to other teaching methods.

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