

Relationship among necessity, importance of creative teaching methods, and strengthening core competencies

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[Abstract]

This study was conducted to find out the relationship between the perception of the necessity and importance of creative teaching methods and core competencies in universities. A total of 142 people who voluntarily agreed to participate in the study were selected and surveyed using the Naver online questionnaire. It was found that the necessity and importance of creative teaching methods was related to the sub-factors of core competencies such as practical field competency, problem-solving competency, convergence competency, communication competency, job ethics, community consciousness. University education should actively introduce and apply creative teaching methods such as action learning and PBL, focusing on improving core competencies, which are actual abilities to be performed in the field.

▶ **Key words:** action learning, core competencies, creative teaching methods, problem-based learning, University education

[요 약]

본 연구는 대학에서 창의적 교수법의 필요도와 중요도에 대한 인식과 핵심역량과의 관련성을 알아보고자 실시하였다. 네이버 온라인 설문지를 이용하여 자발적으로 연구 참여에 동의한 총 142명을 최종 연구대상자로 선정하여 조사하였다. 창의적 교수법의 중요도, 핵심역량의 하위요인인 현장실무역량, 문제해결역량, 융복합역량, 의사소통역량, 직업윤리, 공동체의식과 창의적 교수법 필요도와 관련성이 있는 것으로 나타났다. 대학교육은 현장에서 실제 할 수 있는 능력인 핵심역량 향상에 초점을 맞추어 액션러닝, PBL 등과 같은 창의적 교수법을 적극적으로 도입하여 적용해야 할 것이다.

▶ **주제어:** 대학교육, 문제중심학습, 액션러닝, 창의적 교수법, 핵심역량

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I. Introduction

The World Economic Forum report stated that the Fourth Industrial Revolution fundamentally changed the nature of universities, such as an explosive increase in the total amount of knowledge and acceleration of knowledge convergence[1]. In addition, the Global Industry-Academic Cooperation Forum, hosted by the Ministry of Education, emphasized the need for creative talents with self-learning and problem-solving skills[2].

According to the trend of the times, university education should cultivate the talent needed in the industrial field. Since uniform memorization education cannot respond to the era of the Fourth Industrial Revolution, it is necessary to focus on education that develops the power of thinking and problem-solving skills. At this point, educating talented people with future capabilities has become an important duty of universities[3], and universities are expanding learner-centered class operations such as project learning that emphasize student participation and communication.

Competency-based education in preparation for the 4th Industrial Revolution is an education that strengthens the connection with the highly socially suitable vocational field and can teach students integrated future competencies so that students can solve problems in specific situations[4].

Since creative teaching methods are learner-centered education, they can actively draw students' learning and increase their learning effects in terms of academic achievement and problem-solving approaches compared to cramming methods. In university education, it is necessary to identify and analyze what core competencies are required by the industry, and to cultivate future talents by applying appropriate teaching methods.

In order to help students perform their duties perfectly in the industrial field of their major, thinking and practicing creative teaching methods that can improve learning motivation and learning competency has become essential in the educational field[5].

In creative teaching methods, action learning refers to the process in which participants as a whole team or an individual form a learning team to draw a solution of existing task that one must solve with a learning coach and learn the content of the task and task solving process through knowledge acquisition, questioning, feedback, and reflection[6].

Problem-based Learning(PBL) is one of the small group-level cooperative learning that learners clarify the difference between necessary knowledge and the knowledge one already possessed to solve the problem by activating the knowledge already had and attempts to solve problems through critical thinking[7].

The difference between action learning and problem-based learning is that action learning is based on current problems for educational and management purposes, and learners choose problems themselves, but problem-based learning (PBL) is for student education purposes only, so professors construct real problems or hypothetical problems and provide them to learners[8].

Recently, in the field of health majors, interest in the necessity and importance of creative teaching methods is increasing[9], and learner-centered teaching methods are being studied as a way to effectively acquire and improve the quality of learning. In order to strengthen their capabilities, activity classes that strengthen students' active participation activities and interactions are needed. It has to be with teaching methods that can promote creative thinking and critical thinking with curiosity. To do those activity classes well, it is necessary to diagnose students' prior knowledge and needs, design systematic and clear educational content, and develop various teaching methods.

In future education, it was emphasized that competencies such as creativity, problem-solving skills, critical thinking skills, collaboration skills, and communication skills should be cultivated[10].

Considering these points, it is necessary to explore the necessity and importance of the operation of creative teaching methods to strengthen core competencies

cies. And how to teach these competencies is more important in universities.

Until now, many case studies have been conducted on class satisfaction[11], analysis of the needs of change to enhance competency[12][13] applied to subjects in relation to creative teaching methods, but not many studies have explored the need and importance of creative teaching methods to strengthen core competencies. Considering that creative teaching methods can have a significant impact on students' competency content, it is necessary to study the relationship between recognition of the necessity and importance of creative teaching methods and core competencies.

In addition, research on the necessity of creative teaching methods and relevance between sub-factors of core competencies such as practical field competency, problem-solving competency, convergence competency, communication competency, occupational ethics, community consciousness and creative teaching methods, should be conducted.

This study aims to investigate the relationship between core competencies and the perception of the necessity and importance of creative teaching methods to strengthen students' problem-solving skills and core competencies. Focusing on improving core competencies required by industries, creative teaching methods such as action learning and PBL are actively applied to analyze the effects on students' problem-solving ability and self-directed learning ability, and review the expansion and application of creative teaching methods through research results.

II. Study Methods

1. Study Subjects

The study used convenience sampling method for students and graduates from some universities in Daegu. In the Naver form online questionnaire, the purpose of the study was posted to the subjects, and only the subjects who voluntarily agreed to participate in the study filled in questionnaire by self-writing method

ng method

The survey was conducted from 31 March to 13 April 2021, using G*power 3.1.3 (Faul, Erdfelder, Lang, & Buchner, 2007) based on Cohen's Power Analysis, and the minimum sample size required under the condition of 5% significance level(both sides), power 95%, and effective size 0.05 was 138 people, but the total 150 questionnaires was distributed. For the final analysis, 142 copies were finally analyzed, excluding the questionnaire where the answer to the questionnaire was omitted.

2. Research method

A structured self-entering questionnaire was used to collect the data of this study, and the general characteristics were composed of three questions: gender, grade, and age.

The creative teaching method questions were six questions: whether problem-solving learning (PBL) and action learning teaching methods were recognized, whether they had experience and class satisfaction taught with creative teaching methods, and efficient subjects and teaching methods.

In addition, the need and importance of creative education, and 8 questions of strengthening six core competencies were allowed to be answered on the Likert 5-point scale, and the higher the score, the higher the need and importance, and the higher the score of the core competency reinforcement.

In the cronbach's α coefficient of this study, the necessity and importance of creative education was 0.945 and the core competency reinforcement was 0.977.

3. Data analysis

The study used the SPSS version 26.0(IBM Corp, Armonk, USA) statistical program, and the significance level was tested at 0.05. Frequency analysis and descriptive statistical analysis were used for the general characteristics and the awareness and experience of creative teaching method of the subject, and χ^2 -test were conducted on the relationship between variables.

In addition, t-test, one way ANOVA were used for

differences in the need and importance of creative teaching methods, differences in help of core competency reinforcement, and the post-test was analyzed by Scheffe test. Correlation analysis was used to confirm the necessity, importance, and relationship with core competency reinforcement of creative teaching methods.

III. Results

1. Recognition and experience of creative teaching methods according to general characteristics

<Table 1> shows the results of PBL cognition, action learning cognition, class experience, efficient subjects, and class methods according to the general characteristics of the study subjects. There was a significant difference in the grade ($t=7.908, p<0.05$) for PBL recognition.

There was a significant difference in the age for whether they have experience in creative teaching methods or not ($t=19.552, p<0.001$). In addition, there was a significant difference in an efficient subject, according to grade ($t=25.776, p<0.001$), age ($t=9.186, p<0.05$), in an efficient teaching method, according to grade ($t=17.864, p<0.01$), age ($t=12.489, p<0.01$).

2. The satisfaction, necessity, and importance of creative teaching methods and strengthening core competencies according to general characteristics

<Table 2> shows the results of satisfaction, necessity, and importance of creative teaching methods and core competency enhancement according to the general characteristics of the study subjects. In the grade, graduates showed the highest results in the need and importance of creative teaching methods ($p<0.01$), and as a result of post-analysis, there was a statistically significant difference in graduates than in the second grade. Depending on the age, it was found that the lower the grade, the less important it was to the importance of creative teaching method ($p<0.05$).

3. The necessity, and importance of creative teaching methods and strengthening core competencies according to the recognition of creative teaching methods and teaching experience

<Table 3> shows the results of the necessity, and importance of creative teaching methods and strengthening core competencies according to creative teaching method recognition and teaching experience. Knowing PBL, the need and importance of creative teaching methods were high ($p<0.001$), as for core

Table 1. Creative Teaching Awareness and Experience According to Demographic Characteristics

n=142

Division	n	PBL		Action learning		Class experience		Efficient courses			Teaching methods			
		Yes	No	Yes	No	Yes	No	Theory	Practice	Both	Remote	Face-to-face	Mix	
M±SD														
Sex	Male	6	62	74	2	4	5	1	2	3	2	2	2	
	Female	136	3	3	30	106	84	52	30	49	57	28	53	55
		t / x2	.045		.418		1.143		.177			.561		
Grade	2 nd	30	8	22	4	26	17	13	10	8	12	9	9	12
	3 rd	43	18	25	12	31	31	12	12	20	11	16	15	12
	4 th	12	7	5	3	9	9	3	6	0	6	2	4	6
	graduate	57	32	25	13	44	32	25	3	23	31	3	27	27
		t / x2	7.908*		2.210		3.913		25.776***			17.864**		
Age	≤22	58	23	35	11	47	40	18	18	23	17	20	20	18
	23-29	57	32	25	16	41	42	15	10	20	27	9	22	26
	30≤	27	10	17	5	22	7	20	3	8	16	1	13	27
			t / x2	4.143		1.673		19.522***		9.186*			12.489**	

**Statistically significant differences by x2-test at $\alpha=0.05$

Table 2. Satisfaction, Need, Importance of Creative Teaching Methods and Help in Strengthening Core Competencies According to General Characteristics

n=142

Division	N	M±SD				
		Satisfaction	Need	Importance	Help in core competencies	
Sex	Male	6	3.20±.44	3.33±.81	3.33±.81	4.17±.70
	Female	136	3.75±.74	3.61±.93	3.57±.91	4.35±1.13
	t		-1.633	-.712	-.631	-.393
Grade	2nd	30	3.58±.61 ^a	3.20±.96 ^a	3.16±.91 ^a	3.38±1.03 ^a
	3rd	43	3.80±.74 ^a	3.41±1.05 ^{ab}	3.34±1.02 ^{ab}	3.5±.82 ^a
	4th	12	3.44±.72 ^a	3.41±1.24 ^{ab}	3.41±1.16 ^{ab}	3.2±1.07 ^a
	graduate	57	3.78±.79 ^a	3.89±.72 ^b	3.87±.73 ^b	3.85±1.08 ^a
	F		.808	4.379**	5.047**	2.401
Age	≤22	58	3.67±.65	3.39±.93	3.32±.92	4.23±1.12
	23-29	57	3.69±.78	3.71±.97	3.71±.92	4.32±1.22
	30≤	27	4.14±.89	3.77±.75	3.74±.76	4.62±.85
	F		1.263	2.393	3.404*	1.123

** Statistically significant differences by t-test or one-way ANOVA test at α=.05

competency reinforcement, it was found that creative teaching methods were helpful in the group that knew PBL($p<.005$).

In addition, the group that knows action learning showed high results, showing significant differences in the class satisfaction($p<.05$), the need for creative teaching methods($p<.001$), the importance for creative teaching methods($p<.001$), and help in core competency reinforcement($p<.01$). For a group with experience in taking creative teaching classes, there was a significant difference in the need($p<.001$) and importance($p<.01$) for creative teaching method, core competency reinforcement($p<.01$), showing high results.

Table 3. Recognition of Creative Teaching Methods, the Need and Importance of Creative Teaching Methods, Reinforcing Core Competencies

Division	N	M±SD				
		Satisfaction	Need	Importance	Help in core competencies	
PBL	Yes	65	3.75±.75	3.89±.83	3.90±.78	4.65±1.07
	No	77	3.66±.71	3.35±.94	3.27±.91	4.09±1.09
t			.550	3.599***	4.401**	3.084**
Action learning	Yes	32	3.96±.74	4.09±.73	4.18±.61	4.79±1.07
	No	110	3.60±.71	3.45±.93	3.38±.89	4.21±1.10
t			2.166*	3.558***	4.727***	2.642**
Exp Class	Yes	89	3.71±.73	3.79±.81	3.71±.81	4.53±1.03
	No	53	3.26±.74	3.26±1.02	3.30±1.01	4.03±1.19
t			3.428***	2.699**	2.662**	

4. Relationship among necessity, importance of creative teaching methods, and strengthening core competencies

The correlation results with the necessity, importance of creative teaching methods, and core competency reinforcement are shown in <Table 4>. Importance of creative teaching method($r=.896$, $p<.01$), field practice ($r=.680$, $p<.01$), troubleshooting($r=.629$, $p<.01$), convergence($r=.621$, $p<.01$), communication ($r=.619$, $p<.01$), professional ethics($r=.580$, $p<.01$), community($r=.523$, $p<.01$) among the sub-factors of core competencies. They were related to the need for creative teaching methods.

In other words, there was a positive (+) relationship with the necessity of creative teaching in university education to strengthen the importance of creative teaching methods and the six core competencies, which means that creative teaching methods are necessary in university education.

IV. Conclusions

As the recent paradigm shift in university education and the rapid change in university education due to the COVID-19 situation, the education of vocational colleges faced a new educational environment. Universities need innovation and change to respond to rapidly changing internal and external environment

Table 4. Relationship Between the Need and Importance of Creative Teaching Methods and the Degree of Assistance in Strengthening Core Competencies

Variables	Need	Importance	Field practice	Problem solving	Convergence	Communication	Occupational ethics	Community	Average core competencies
Need	1								
Importance	.896**	1							
Field practice	.680**	.700**	1						
Problem solving	.629**	.645**	.850**	1					
Convergence	.621**	.618**	.841**	.893**	1				
Communication	.619**	.615**	.818**	.880**	.865**	1			
Occupational ethics	.580**	.597**	.824**	.807**	.818**	.832**	1		
Community	.523**	.509**	.752**	.806**	.786**	.838**	.810**	1	
Average core competencies	.657**	.663**	.915**	.943**	.937**	.943**	.917**	.899**	1

** $p < 0.01$ The data were analyzed by person correlation coefficient

ents. The representative educational innovation efforts of universities can be said to be a transition from traditional teaching methods to learner-centered creative teaching methods.

Universities are attempting to apply various teaching methods to foster talented people with core competencies required by the industrial field, reflecting changes in the educational environment through the new teaching method. Therefore, this study was conducted to find out the relationship between the perception of the necessity and importance of creative teaching methods in universities and core competencies.

The results of this study are summarized as follows.

First, the results of satisfaction, need, and importance of creative teaching methods according to the general characteristics of the study subjects showed the highest scores in graduates, and the importance of creative teaching methods was lower as the age was lower. These results are believed to show the graduates' high perception of creative teaching methods that can cultivate comprehensive thinking skills, recognizing that they need comprehensive coping skills that are not just knowledge in the process of experiencing and solving various problems in the actual industry.

In the effect of employee training of a company, action learning is a key factor in improving job problem solving ability[11], and it is reported that it has

the effect of recognizing a problem clearly and trying to find a solution for oneself[12].

In a study of social workers, it was proposed to introduce a PBL teaching method that fosters the ability to solve various problem situations and learns the value of critical thinking, communication, respect, and cooperation[13].

In this study, the results of this study can be supported in that the perception of creative teaching methods is positive, in that the results were derived by applying creative teaching methods centered on PBL and action learning teaching methods.

Second, if you have the perception of creative teaching methods such as action learning and PBL and have teaching experience, it is said that it helps to strengthen the need, importance of creative teaching methods, and core competencies.

In a study verifying the effectiveness of action learning in college, it was called action learning as a way to improve the core competencies required for employment after graduation[17]. In addition, it was said that at university classes applying action learning can be a new method as a teaching and learning method of a competency-based curriculum[18]. And PBL proved its effectiveness by presenting empirical results that it is an effective teaching-learning method for enhancing problem-solving ability, which is a core competency in the future[19]. It was said that the PBL teaching method had a positive effect on the improvement of problem-solving skills, integration skills, and com

munication skills necessary to cultivate practical competencies[20].

Compared to these preceding studies, creative teaching methods such as action learning and PBL have already been confirmed to have their effectiveness, and it seems that students who have experienced the effectiveness of these teaching methods highly recognize it is more necessary, important, and helpful in strengthening core competencies.

Third, it was found that they have relevance among the importance of creative teaching methods, the sub-factors of core competencies such as field practice competency, problem-solving competency, convergence competency, communication competency, occupational ethics, and the need for creative teaching methods.

This means that creative teaching methods are needed to strengthen core competencies in university education. In a comparative study before and after class using action learning, it was reported that the core competencies of communication ability, critical thinking tendency, creative problem-solving ability, and cooperative self-efficacy had an effect[21][22].

As a result of performing diagnosis before and after PBL education using the Core Competency Diagnosis System(K-CESA) for college students, it was said that there was a positive effect on self-management competency and interpersonal competency[23]. In addition, it was verified that PBL classes are more effective in improving learners' creative problem-solving skills than general classes[24].

Putting these results together, creative teaching methods play an important role in improving the core competencies required by the future society of college students. University education should actively introduce and apply creative teaching methods such as action learning and PBL, focusing on improving core competencies, which are actual abilities to be performed in the field. Despite the above meaningful results, this study has limitations in generalization as a cross-sectional study of some university students and graduates. In future follow-up studies,

it is necessary to investigate the relationship between various creative teaching methods and core competencies in addition to PBL and action learning, and to compare before and after the application of the creative teaching method to verify its effectiveness.

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