A Research of Fostering Pre-Service Teacher' Creativity

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1.Introduction

On considering the future of Japan that caught up with the level of advanced countries in a very short time, fostering creativity in children is one of the most important goals of education. Unfortunately enough, there is few theoretical and practical research that conducted how to foster creativity of elementary and junior-high school children through every day classes. This research, simultaneously a lecture and seminar was conducted to raise pre-service teacher's sensitivity, skills and knowledge to creativity. The term of a lecture was a semester.

2.Method

Subjects. Fourth grade of 90 Shizuoka university students who majored teacher education in elementary school.

Research year and term. From October to February in 1987-8. The number of lectures and seminar was 14 times. The name of lecture was 'Classroom Group Psychology.' The contents of the lecture were as follows:

a)The terms that describe group characteristics.

1) Group cohency. 2) Group norm. 3) Group oppression. 4) Conformity to the group. 5) group morale.

b) What is the group?

c) The traits of the class group.

d) The development of the class group.

e) The structure of the class group.

1) sociometric test, 2) sociogram.

f) The leadership in the class group.

1) The leadership of the teacher. 2) Students' leadership, 3) Democratic leadership, 4) Teacher-centered and students-centered leadership.

g)PM leadership(by Jyuji MISUMI,Kyusyu University).

h)Why does today and future Japan need creativity so much?

1) Political, economical, educational and academic situations that surrounding today's Japan.

i) What is creativity?

1) Creativity in discovering and invention. 2) creativity in arts and literature, 3) creativity in self-actualization.

j) The development of creativity in the school age.

k) What conditions elicit students' creativity?

1) Atmosphere of the class. 2) Type and style of questions that is asked by the teacher. 3) Preparation for the problem solving tasks based on interest of the student.4)Open questions to the problem.5)Divergent thinking instruction to the problem.6)Hypothetical thinking to the problem.

l) Fostering creativity by Brainstorming and KJ method.

m) Fostering creativity by Concept Mapping Method.

1)What is Concept Mapping Method ? 2)What is meaningful learning? 3)Understanding meaning and frame of a story.4)Class discussion to the maps depicted on the blackboard. 5)Discovery learning in Science and

Social-Study materials using by Concept Mapping.

Questionnaire

Seven questions were asked to the students. For each question students answered on 4 points scale. Each question were as follows:

a) Did you understand how to treat the small groups in the classroom?
b) Did you get knowledge about KJ Method before you take this lecture?
c) Did you understand how Concept Mapping concern about creativity?
d) Did you get knowledge about creativity before you take this lecture?
e) Did you understand why our recent society need creativity?
f) Did you understand the differences between intelligence and creativity?
g) Did you understand why Japanese society has difficulty with fostering creativity?

Test scores

Creativity Test Score.

Two kinds of following creativity test were used. a)Unusual use of tin-cans.b)improvement of monkey doll. Based on all data that the students described, 1)Frequency score,2)Flexibility score,3)Originality score, and 4)Elaboration score for each student were counted. In addition, adding each corespondent creativity score, total Frequency-, Flexibility-,Originality-, and Elaboration-score were computed. As a creativity test score, four kinds of total score were used.

Concept Map Application Score(C-Map score).

After the students learned the Concept Mapping Method, they were asked to think out applicable area of Concept Mapping in education and real world in order to develop students and employees creativity. Based on the number of ideas, one of 1-5 point was given to each student.

KJ Method Application Score(KJ score).

After the students learned the KJ Method, they were asked to think out applicable area of KJ Method in education and real world in order to develop students and employees creativity. Based on the contents of ideas, one of 1-5 point was given to each student.

Final Examination score (FE score).

Final examination consisted of 3 problems. First was a short description of 8 key words in the lecture. Second and third were a short statement test to the some topics included in the lecture.

Rating of each test.

In the research, students took 5 tests. They were 2 creativity tests, Concept Map Application test, Concept Map application test, and Final Examination test. Except Final Examination test, two graduate students rated each test individually. The author rated Final Examination test.

3.Results and Discussion

a) Results of the questionnaire

Fig.1-7 show that the development of knowledge and consciousness to the concept of group, thinking, creativity, and skills for fostering creativity. Each figure indicates how much percent of students agreed each questionnaire item. Alternative 1 is nothing at all or reduced. 2 is little understood or same. 3 is fairy well understood or increased. 4 is completely understood or much increased. Except Fig.1 and 3, the highest

percent were fallen in point 3 or more. Especially, concerning creativity items(Fig.3-7), more than 50%(Fig.3),more than 90%(Fig.4),more than 75%(Fig.5),more than 65%(Fig.6),more than 68%(Fig.7) of students felt they developed the concept of creativity if we add alternative 3 plus 4 percent.
In very limited hours, they learned 1)what is creativity,2)why Japanese society has difficulty with fostering creativity, 3)what method is available for fostering creativity, 4) How to treat the small groups in order to develop creativity.

Below 7 Tables show that knowledge about creativity, KJ Method, Concept Mapping are transmittable to students in limit hours.

Table 1. Did you understand how to treat the small groups in the classroom?

1.Nothing at all	2
2.Little understood	51
3.Fairy well understood	44
4.Completely understood	3

Table 2. Did you get knowledge about KJ Method before you take this lecture?

1.Reduced	0
2.Same	0
3.Increased	49
4.Much increased	51

Table3. Did you understand how Concept Mapping relate to creativity?

1.Nothing at all	5
2.Little understood	44
3.Fairy well understood	46
4.Completely understood	4

Table 4. Did you get knowledge about creativity before you take this lecture?

1.Reduced	0
2.Same	0
3.Increased	49
4.Much increased	51

Table 5. Did you understand why our recent society need creativity?

1.Nothing at all	0
2.Little understood	22
3.Fairy well understood	50
4.Completely understood	28

Table 6. Did you understand the differences between intelligence and creativity?

1.Nothing at all	0
2.Little understood	30
3.Fairy well understood	56
4.Completely understood	14

Table 7. Did you understand why Japanese society has difficulty with fostering creativity?

1.Nothing at all	1
2.Little understood	25
3.Fairy well understood	52
4.Completely understood	24

b) Correlation among creativity test score, KJ score, C-Map score, and Final Examination score.

Table 1. shows the correlational coefficients(r) among above 3 tests and Final Examination test. KJ score has relatively higher correlation to Frequency-score(r=.39), Flexibility(r=.49), Elaboration(r=.30), while has lowest correlation to Originality(r=.08). C-Map score has relatively higher correlation to Elaboration score, but has lower relations to remained three creativity scores.

KJ score and C-Map score has very high relations(r=.59).

Final Examination score has higher correlation to KJ score(r=.38),and C-Map score(r=.38). In contrast with these correlations, it has very low relation to four of creativity test score.

Table 8. Correlation among creativity test score, KJ score and C-Map score, and Final Examination score.

	Frequency	Flexibility	Originality	Elaboration	KJ score	C-Map	FE score
Frequenc	1						

y							
Flexibility	0.69	1					
Originality	0.42	0.17	1				
Elaboratio n	0.33	0.26	0.34	1			
KJ score	0.39	0.49	0.08	0.3	1		
C-Map	0.24	0.25	0.18	0.42	0.59	1	
FE score	0.08	0.06	0.1	0.12	0.38	0.38	1