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A Case Study of Extra-Curricular Activities of Korean College Students: Focused on Meteorological Satellite Summer-Camp Program

Seak-Zoon Roh[1], Eunmi Chang[2] and Kyeong Park[3*]

[1]*Sungshin Women's University*
[2]*Ziin Consulting*
[3]*Sungshin Women's University*
[1]*szroh@sungshin.ac.kr*, [2]*emchang21@gmail.com*, [3]*kpark97@sungshin.ac.kr*

Abstract

The purpose of this study was to investigate the motivation and satisfaction for meteorological satellite summer camp extra-curricular activity as a case study in order to suggest effective ways to enhance college-based extra-curricular activities. Survey data from 127 college students who participated in the summer camp operated from year 2011 to 2014 were collected. Frequency analysis, t-test, and ANOVA test were conducted to analyze the data. The results were as follows; First, the highest participation motive on extra-curricular activity of the summer camp program participants was 'to improve the capacity for the major,' and this was the same for male and other major college students than atmospheric sciences major every year. Second, regarding participation satisfaction, the participants appeared to be largely satisfied. Regardless of the year of activity participation, gender, and major, there were no significant differences on the participants' responses toward two questions: "I participated actively in the lecture" and "I will recommend the Camp to other students". Third, in terms of operational satisfaction, the summer camp program participants thought it quite satisfactory.

Keywords: *Extra-curricular Activities, Korean College Students, Meteorological Satellite Summer Camp Program*

1. Introduction

Students learn and acquire many things in educational institutions during their school years. However, it is almost impossible for students to obtain all the necessary knowledge, skills, and competencies exclusively from school or other formal educational institutions to resolve problems throughout their school years. Recently, there have been efforts made among elementary and secondary schools to combine relevant subjects together to provide convergence education, but these efforts are still feeble. In universities, academic courses have a tendency to segment into narrow and specific topics more than ever before, and many universities are adjusting their required credits for graduation from 140 to 130. Some universities have even reduced the required credits to 120. Therefore, it is quite difficult for students to acquire sufficient knowledge and competencies in their academic field.

Companies these days are looking for human resources with expertise in their professional fields. However, most universities are still lacking practical teaching-learning methods to fulfill the needs of the students in accordance with companies' requirements, making students realize the deficiencies in their academic courses. In addition, the current university curricula do not meet essential conditions because of insufficient time, high costs, and a lack of space for high-tech equipment.

*Corresponding Author

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Adding extra-curricular activities to the current university curriculum has become an alternative to overcome the limitations of contents, teaching-learning methods, time, and space. An extra-curricular activity is defined as a formal or informal teaching-learning activity beyond the regular curriculum or educational program. For example, it is impractical to include hiking, golf, skiing, etc. into the regular physical education curriculum due to lack of access to the physical environment. In science or mathematics, things like club activities, special lectures, seminars etc. can be included in the extra-curricular activities for computer programming, astronomy, or earth science.

Previous studies on extra-curricular activities are related to the following topics such as their effectiveness and influence on learners' creative thinking, academic achievements, social skills, dropout rates, delinquency. Themes are also spread out throughout various fields like P.E, science, mathematics, legal education, after-school hands-on activities, *etc* [1-11]. In addition, there have been studies comparing extra-curricular activities in Korea to those of other countries [12-14]. Those studies laid the emphasis on students ranging from elementary to secondary school, yet, there are few studies on university students.

This study looks into university students who participated in summer camps for meteorological satellite studies as an extra-curricular activity from 2011 to 2014, and who wish to commit themselves to the meteorological satellite industry in the future. The study aims to investigate the participants' motivation toward the program and their level of satisfaction afterwards. Furthermore, it examines the ways to expand and stimulate extra-curricular activities for university students and their development.

To address the goals above, the detailed research questions are as follows:

1. What is the motivation that attracts university students to participate in the summer camp program for meteorological satellite studies? Does motivation vary by year and learners' individual factors such as gender and major?
2. To what extent are participants satisfied with the summer camp for meteorological satellite studies? Does satisfaction vary by year and learners' individual factors such as gender and major?

2. Literature Review

Kim [1] pointed out "the official curriculum based on pre-existing formal subject matter has successfully contributed to the implementation of legal education in schools, yet its teaching-learning contents and methods have been limited by time and physical environment" (p.2). In order to cultivate legal knowledge through legal education effectively, Kim claims that extra-curricular activities in school should be more stimulating. Extra-curricular activities that remain relatively uncommon include inviting guest speakers, organizing special lectures on law-related anniversaries, club activities, field trips and visiting relevant agencies, running peer mediation without a teacher or adult involved, teen court and class court, and other types of after-school extra-curricular activities.

Lee and Paek [2] study students of racial minorities in the U.S during attempts to enhance their performance ability and interest in science and mathematics. They divided the students into two groups: those who participated in after-school research activities, writings, field trips, and family support programs, and those who did not do so at all. Between the two groups, the researchers analyze their academic achievements, self-concept, and evaluation on project activities. As a result, science scores from those who participated in such activities were significantly higher than

those who did not. Also, the former group was more positive towards project activities, and their self-concept significantly increased during the project.

Lee and Kang [3] investigated a middle school that runs an after-school science club that includes creative hands-on activities. The research took two semesters and examined two different groups: a control group that has only regular science classes, and an experimental group where students are taught to enhance their creative and critical thinking and experience STEAM (Science, Technology, Engineering, Art and Mathematics) teaching strategies over 6 different topics in 18 periods. When compared to the control group which had only regular science classes, the experimental group had a significantly higher result on fluency and originality among creative thinking, and the subcomponents of critical thinking in problem-solving: the ability to be aware of issues, establish hypotheses, control variables, analyze and convert data, draw conclusions, and generalize conclusions. However, flexibility in critical thinking did not significantly improve statistically.

Kim [4] employs the reading section in PISA (Programme for International Student Assessment) of the OECD (Organisation for Economic Co-operation and Development) 2009 to analyze the influence of curricular activities on students' ability to explain the text, find information in the text, identify the relationship between texts, learn knowledge relevant to the text, and memorize the text. The influence of the following extra-curricular activities on the PISA result was examined: drama, musical, making school yearbooks or newspapers, reading or debate clubs, special lectures from writers or journalists, and cooperation with local libraries and newspaper companies. The result showed that curricular activities considerably had both positive and negative effects on the PISA results, but extra-curricular activities had not much influence on the PISA result.

Le [9] investigates the effects of extra-curricular activities in Australia: whether Australian adolescents' taking part in sports and art activities reduces misbehavior (smoking, alcohol, drugs). The finding indicated that the effects of adolescents participating in extra-curricular activities on misbehavior depend on activity types, gender, and socioeconomic status. Among those who participated in extra-curricular activities other than sports or art, both male and female subjects reduced alcohol and drug abuse on a weekly basis. Among those who participated in art activities, only female subjects' weekly alcohol and drug abuse decreased. Among those who participated in non-organized sports activities, only male subjects' regular smoking and drug abuse decreased.

Darling, Caldwell, and Smith [6] apply the panel data carried out in 9 different high schools in the states of California and Wisconsin from 1987 to 1991 to study the influence of extra-curricular activities in the schools on the participating adolescents' alcohol use, drug use, academic performance, learning attitude, and learning atmosphere. The analysis showed that there was a statistically significant difference between the two groups: those who participated in school extra-curricular activities and those who did not. Students who took part in extra-curricular activities had higher academic scores, a more positive attitude toward school, and created a better learning atmosphere in class, but there was no positive effect on decreasing alcohol and drug use.

Fleming *et al.* [8] examine the relationship between after-school activities and misbehavior and delinquency in school among students ranging from the sixth grade of elementary school to the first year of high school based on a social development model. The finding indicated that anti-social behavior had no significant relationship to after-school activities in which they participated during the transition from middle to high school, whereas participating in non-organized activities in the first year of high school had a positive effect in deterring criminal acts.

To summarize the analytical results of the previous studies, most studies on extra-curricular activities targeted students ranging from elementary to secondary schools, and it is necessary to run extra-curricular activities as a complementary action to regular curricular activities. Moreover, extra-curricular activities in general (more or less different from the variables) had a positive influence on cognitive and affective development. Despite the difference in cognitive and affective aspects among elementary school, secondary school, and university students based on such results, it is rational to say that extra-curricular activities for university students may also have a positive influence on their cognitive and affective development.

3. Methods

3.1. Participants

As part of the 'service business in construction of training systems for the empowerment of meteorological satellite application', the KMA (Korean Meteorological Administration) runs summer camps for meteorological satellite studies. These programs had been held by the National Meteorological Satellite Center and Ziin Consulting, a collaborative research institute in the field of educational training, in order to extend a pool of professionals in the meteorological satellite industry, and to improve the use of information through satellite images.

Participants in this study were 127 undergraduate students; they all joined the summer camps that were run four times from 2011 to 2014 during the summer vacation, for four days and three nights each. There were some variations in each year, in training contents, and in hours, but the main questionnaires' content was nonetheless also the same.

3.2. Instruments

We distributed the survey questionnaire in the closing ceremonies of the summer camp programs in each year. It consisted of two main categories asking about the motivation of program participation: (1) Strongly interested in meteorological satellite studies, (2) Strong recommendation from my professor. They were allowed to select all the equivalent answers among five choices; only one item, however, was answered by multiple choices. In addition, the survey items (total 11 items) consisted of two factors of program satisfaction (5 items) such as "I actively participated in the class." and "I learned adequate knowledge though the lectures."; and of satisfaction with program management such as "I am satisfied with the teaching materials." and "The instructors prepared appropriate hands-on materials.". Ten items used a 5-point Likert scale, from strongly disagreed (1 point)-to strongly agreed (5 points).

3.3. Analysis

In this study, we used SPSS Statistics 21 for the analysis in order to examine the participants' motivation and the level of satisfaction with the program, and to investigate whether those variables vary by year and learners' characteristics such as gender and major. The answers on the survey items regarding the participants' motivation related to the program were processed as binary multiple responses. Frequency analysis, *t*-test, and ANOVA were carried out to analyze the responses on the rest of the items. We analyzed every data with a significance level of less than 5% ($p < .05$).

4. Results

4.1. Motivation for Participating in Summer-Camps for Meteorological Studies

As a result of selecting all the equivalent answers among 5 choices on the items in relation to participants' motivation towards the summer camp, 84 out of 127 (66.1%) respondents answered that they participated in the program in order "To increase learning ability of their majors", which was the most popular response. It is followed by "To find a job related to meteorology" (79 respondents, 62.2%), "Due to strong interests in meteorological satellites" (64 respondents, 50.4%), and "Strongly recommended from my professor" (38 respondents, 29.9%) as the least popular response (See Table 1).

Table 1. Motivation for Participating in Summer-Camps Program
(multiple response, N=127)

Participation Motivation	*n*	*%*
Due to strong interests in meteorological satellites	64	50.4
Strongly recommended from my professor	38	29.9
To increase learning ability of my major	84	66.1
To find a job related to satellite information	79	62.2
To find a job related to meteorology	45	35.4
Total	310	244.1

These findings indicate that the undergraduate students in the summer camp for meteorological satellite studies acknowledge that they can strengthen their competence in their major through the summer camp programs. Also, the results show they participated out of their own free will rather than through the recommendation of others. Even though we did not promote the program actively due to the limitations of the budget and equipment, along with a maximum enrollment of only 30 students a year, it is quite competitive showing a competition ratio of 4-to-1. We can expect that promotion of the program will be beneficial to the NSMC by its associated organizations, and there might be more suggestions for having universities run the meteorological satellite studies programs during times in which it is difficult for the associated organizations to do so.

As a result of the investigation on whether students' motivation was different depending on year and learners' characteristics (gender and major), it was found that by year, the most common answer was "To find a job related to meteorology" (18 respondents, 78.3%), followed by "Due to strong interests in meteorological satellites" (17 respondents, 73.9%) in the year of 2011. Meanwhile, in 2012, the most common answer was "To increase their learning ability of their major" (22 respondents, 78.6%), followed by "To find a job related to meteorology" (19 respondents, 67.9%). In 2013, the most common answer was "To increase their learning ability of their major" (15 respondents, 62.5%), followed by "Due to strong interests in meteorological satellites" (13 respondents, 54.2%). Finally, in 2014, the most common answer was "To increase their learning ability of their major" (33 respondents, 63.5%), followed by "To find a job related to meteorology" (30 respondents, 57.7%). Therefore, the biggest motivation in the participation of summer camp program after 2011, overall, was "To increase their learning ability of their major". It was followed by "To find a job related to meteorology." In other words, university students normally participate in the summer camp for meteorological satellite studies for the sake of increasing learning abilities in their major and cultivating competency to get a job related to meteorology, although there was a little discrepancy in ranking (See Table 2.).

Table 2. Motivation for Participating in Summer-Camps Program by Year, Gender, and Major
(multiple response, N=127, *n*(%))

Participation Motivation	Year				
	2011	2012	2013	2014	Total
Due to strong interests in meteorological satellites	17 (73.9)	15 (53.6)	13 (54.2)	19 (36.5)	64 (218.2)
Strongly recommended from my professor	9 (39.1)	5 (17.9)	4 (16.7)	20 (38.5)	38 (112.2)
To increase learning ability of my major	14 (60.9)	22 (78.6)	15 (62.5)	33 (63.5)	84 (265.5)
To find a job related to satellite information	18 (78.3)	19 (67.9)	12 (50.0)	30 (57.7)	79 (253.9)
To find a job related to meteorology	12 (52.2)	13 (46.4)	10 (41.7)	10 (19.2)	45 (159.5)
Total	23 (304.4)	28 (264.4)	24 (225.1)	52 (215.4)	127 (1,009.3)

Participation Motivation	Gender			Major		
	Male	Female	Total	Atmospheric science majors	Other majors	Total
Due to strong interests in meteorological satellites	26 (44.8)	38 (55.1)	64 (99.9)	39 (48.1)	25 (54.3)	64 (102.5)
Strongly recommended from my professor	20 (34.5)	18 (26.1)	38 (60.6)	18 (22.2)	20 (43.5)	38 (65.7)
To increase learning ability of my major	41 (70.7)	43 (62.3)	84 (133.0)	57 (70.4)	27 (58.7)	84 129.1)
To find a job related to satellite information	35 (60.3)	44 (63.8)	79 (124.1)	59 (72.8)	20 (43.5)	79 116.3)
To find a job related to meteorology	21 (36.2)	24 (34.8)	45 (71.0)	33 (40.7)	12 (26.1)	45 66.8)
Total	58 (246.6)	69 (242.0)	127 (488.6)	81 (254.3)	46 (226.1)	127 (480.4)

By gender, in the case of male participants, "To increase their learning ability of their major" (41 respondents, 70.7%) was the most common answer, followed by "To find a job related to meteorology after graduation" (35 respondents, 60.3%). In the case of female participants, "To find a job related to meteorology after graduation" (44 respondents, 63.8%) was the most common answer, followed by "To increase their learning ability of their major" (43 respondents, 62.3%). Although there was a slight difference according to gender, it was only the first and the second priority that were inverted, and both female and male participants had similar reasons to join the summer camps as a rule (See Table 2.).

Considering majors, in the case of atmospheric science majors, "To find a job related to meteorology after graduation" (59 respondents, 72.8%) was the most common answer. The second one is "To increase their learning ability of their major" (57 respondents, 70.4%), whereas in the case of other majors, "To increase their learning ability of their major" (27 respondents, 58.7%) was the most common answer, followed by "Due to strong interests in meteorological satellites" (25 respondents, 54.3%). Thus, it shows that there is a significant difference between the two groups in their motivation towards the summer camps. The majors of other participants included geography, geo-informatics, landscape architecture, civil engineering, etc., which are majors in which students learned such techniques as satellite imaging, aerial photograph analysis, geo-informatics skills, or climatology, and which are similar to atmospheric science. For that reason, it is interpreted that

there has been little psychological burden involved with the meteorological satellite program on students who participate in the summer camps (See Table 2.).

4.2. Satisfaction with Summer-Camps for Meteorological Studies

Satisfaction with the summer camp for meteorological satellite studies program can be divided into two factors: satisfaction with the camp participation, and satisfaction with the camp operation. Analyses on the two factors were presented respectively.

4.2.1. Satisfaction with the Camp Participation: University students participating in the summer camps for meteorological satellite studies are mostly satisfied after the camp (M = 3.99/5). In particular, they wanted to highly recommend the camp to their colleagues (M = 4.27/5), and were quite satisfied with the fact that they learned new knowledge through the classes (M = 4.19/5), however they felt a little unfortunate not to have actively participated in class (M = 3.73/5) (See Table 3).

Table 3. Satisfaction Results with the Camp Participation

Question	*M*	*SD*
I actively participated in the class.	3.73	.75
I learnt adequate knowledge through the classes.	3.78	.77
I learnt a lot of new knowledge through the classes.	4.19	.70
I am generally satisfied with the contents of the classes.	3.96	.75
I will recommend this camp to my colleagues.	4.27	.73
Total	3.99	.55

Regarding the questionnaire items “I actively participated in the class” and “I will recommend this camp to my colleagues”, there was not much difference in satisfaction with the camp participation by year. However, regarding the question items “I learned adequate knowledge through the classes”, “I learned a lot of new knowledge through the classes”, and “I am generally satisfied with the contents of the classes”, satisfaction with the camp participation varied by year. “I learned enough necessary knowledge through the classes” between the year of 2012 (M = 4.14, SD = .65) and 2013 (M = 3.58, SD=.83). “I learned a lot of new knowledge through the classes”, among the years of 2011 (M = 4.26, SD = .54), 2012 (M = 4.46, SD = .57), 2014 (M = 4.21, SD = .60), and 2013 (M =3.75, SD=.94). Then “I am generally satisfied with the contents of the classes” between the year of 2012 (M = 4.32, SD = .61) and 2013 (M = 3.54, SD = .72). Among the varied results in the questionnaire items above, satisfaction with the camp participation in earlier years was higher than that in later years (See Table 4).

Table 4. ANOVA Results of Satisfaction with the Camp Participation

Sub-item		*df*	*SS*	*MS*	*F*	Tukey Test
I actively participated in class.	Between Groups	3	.67	.22	.39	
	Within Groups	123	70.23	.57		
	Total	126	70.90			
I learnt adequate knowledge through the classes.	Between Groups	3	5.05	1.68	3.01*	*b>c*
	Within Groups	123	68.77	.56		
	Total	126	73.83			

I learnt a lot of new knowledge through the classes.	Between Groups Within Groups Total	3 123 126	6.89 54.57 61.47	2.30 .44	5.17**	*a*>*c*, *b*>*c*, *c*<*d*
I am generally satisfied with the contents of the classes.	Between Groups Within Groups Total	3 123 126	7.91 62.89 70.80	2.64 .51	5.15**	*b*>*c*
I will recommend this camp to my colleagues.	Between Groups Within Groups Total	3 123 126	3.54 63.36 66.90	1.18 .52	2.29	
Total	Between Groups Within Groups Total	3 123 126	3.31 35.19 38.49	1.10 .29	3.85*	*b*>*c*

* $p < .05$, ** $p < .01$, *a*: 2011, *b*: 2012, *c*: 2013, *d*: 2014

Regarding the questionnaire item, "I will recommend this camp to my colleagues", related to the satisfaction with the camp participation, male participants' responses were higher than those of females (male: $M = 4.41$, $SD = .67$; female: $M = 4.14$, $SD = .75$). Other than this questionnaire item, there was not much difference among other questionnaire items between genders (See Table 5.).

Table 5. *t*-test Results About Satisfaction with the Camp Participation by Gender

Gender		*N*	*M*	*SD*	*t*	*p*
I actively participated in class.	Male Female	58 69	3.66 3.80	.80 .69	-1.063	.290
I learnt adequate knowledge through the classes.	Male Female	58 69	3.90 3.68	.71 .79	1.589	.115
I learnt a lot of new knowledge through the classes.	Male Female	58 69	4.24 4.14	.70 .69	.774	.440
I am generally satisfied with the contents of the classes.	Male Female	58 69	4.05 3.88	.73 .75	1.258	.211
I will recommend this camp to my colleagues.	Male Female	58 69	4.41 4.14	.67 .75	2.099	.038*
Total	Male Female	58 69	4.05 3.93	.53 .56	1.234	.219

* $p < .05$

Among different majors, there was not much difference in the satisfaction with the camp participation, both in terms of overall satisfaction and individual items. That is, there was no difference in the satisfaction with the camp participation between the two groups: those majoring in meteorological satellite-related subjects and those who were atmospheric science majors.

4.2.2. Satisfaction with the Camp Management: Those who participated in the meteorological satellite summer camp were fairly satisfied with the camp operation ($M = 4.09$/5pts). In particular, they considered every instructor to be devoted to their class ($M = 4.26$/5pts), and the overall operation of the camp very good ($M = 4.19$/5pts) whereas they were relatively unsatisfied with the textbooks ($M = 3.94$/5pts) (See Table 6).

Table 6. Analysis Results of Satisfaction with the Camp Management

Question	*M*	*SD*
I was satisfied with the teaching materials.	3.94	.87
The instructors prepared appropriate hands-on materials.	4.04	.73
The overall camp operation was very good.	4.13	.74
Each instructor was well prepared.	4.10	.72
Each instructor was devoted to his/her class.	4.26	.65
Total	4.09	.60

Among the years (2011-2014) that the camp took place, there was a difference in the satisfaction with the camp operation in terms of both overall satisfaction and the individual questionnaire items. In other words, regarding the questionnaire item "I was satisfied with the teaching materials", there was a difference between the year of 2011 (M = 3.83, SD =.93) and 2012 (M = 4.43, SD =.50). There were also differences between the year of 2012 (M = 4.43, SD =.50) and 2013 (M = 3.33, SD =.96), between the year of 2013 (M = 3.33, SD =.96) and 2014 (M = 4.02, SD =.80).

Regarding the questionnaire item "The instructors prepared appropriate hands-on materials", there was a difference between the year of 2011 (M = 3.91, SD =.90) and 2012 (M = 4.43, SD =.57). There were also differences between the year of 2011 (M = 3.91, SD =.90) and 2014 (M = 4.15, SD = .53), and between the year of 2012 (M = 4.43, SD =.57) and 2013 (M = 3.46, SD =.77), and between the year of 2013 (M = 3.46, SD =.77) and 2014 (M = 4.15, SD =.53).

Regarding the question item "The overall camp operation was very good" between the year of 2011 (M = 3.91, SD =.66) and 2012 (M = 4.54, SD =.57), there was a difference between the year of 2011 (M = 3.91, SD =.66) and 2014 (M = 4.10, SD =.84). There was a difference between the year of 2012 (M = 4.54, SD =.57) and 2013 (M = 3.92, SD =.58). We also found the difference between the year of 2013 (M = 3.92, SD =.58) and 2014 (M = 4.10, SD =.84).

Regarding the question item "Each instructor was well prepared", there was a difference between the year of 2012 (M = 4.43, SD =.57) and 2013 (M = 3.67, SD =.70), and between the year of 2012 (M = 4.43, SD =.57) and 2014 (M = 4.19, SD =.62). Regarding the question item "Each instructor was devoted to his/her class", there was a difference between the year of 2011 (M = 4.35, SD =.64) and 2013 (M = 3.83, SD =.70). There was a difference between the year of 2012 (M = 4.54, SD =.57) and 2013 (M = 3.83, SD =.70), and between the year of 2013 (M = 3.83, SD =.70) and 2014 (M = 4.27, SD =.59).

Moreover, regarding overall satisfaction, there was a difference between the year of 2011 (M = 3.99, SD =.67) and 2012 (M = 4.47, SD =.47), between the year of 2012 (M = 4.47, SD =.47) and 2013 (M = 3.64, SD =.57), and between the year of 2013 (M = 3.64, SD =.57) and 2014 (M = 4.14, SD = .49) (See Table 7).

Table 7. ANOVA Results of Satisfaction with the Camp Participation

Sub-item		*df*	*SS*	*MS*	*F*	Tukey Test
I was satisfied with the teaching materials.	Between Groups	3	16.13	5.38	8.22***	*a<b, b<c, c<d*
	Within Groups	123	80.47	.65		
	Total	126	96.61			
The instructors prepared appropriate hands-on materials.	Between Groups	3	13.39	4.46	9.90***	*a<b, a<d, b>c, c>d*
	Within Groups	123	55.41	.45		
	Total	126	68.80			

The overall camp operation was very good.	Between Groups Within Groups Total	3 123 126	6.84 63.14 69.98	2.28 .51	4.44**	*a<b, a<d, b>c, b>d*
Each instructor was well prepared.	Between Groups Within Groups Total	3 123 126	8.44 57.22 65.66	2.81 .46	6.05**	*b>c, b<d*
Each instructor was devoted to his/her class.	Between Groups Within Groups Total	3 123 126	6.67 47.74 54.42	2.22 .38	5.73**	*a>c, b>c, c<d*
Total	Between Groups Within Groups Total	3 123 126	9.28 36.38 45.66	3.09 .29	10.46***	*a<b, b>c, c<d*

* $p < .05$, ** $p < .01$, *a*: 2011, *b*: 2012, *c*: 2013, *d*: 2014

By gender, there was no difference in the satisfaction with the camp operation. By year, in addition, there was no difference in the overall satisfaction with the camp operation, both in terms of the overall satisfaction and individual questionnaire items among majors. That is, there was no difference in the satisfaction with the camp operation between the two groups: those majoring in meteorological satellite-related subjects and those students whose major are atmospheric science.

5. Conclusion

This study examined the question of whether there are differences in students' motivation and satisfaction towards the program by year and learner characteristics (gender and majors), and focused on the case of the summer camps for meteorological satellite studies as an extra-curricular activity. We used frequency analysis, t-test, and ANOVA for collected data analysis.

Based on the results of the data analysis, this study provides several suggestions for developing plans to activate the college students' extra-curricular activities more effectively, efficiently, and attractively.

First, it is necessary that extra-curricular activities include knowledge and techniques related to employment in the long term, as well as provide the contents necessary to increase students' learning abilities of their major in the short term. Participants' main concerns involve the question of whether they will acquire more authentic and practical ideas through the alternative teaching-learning methods, as well as strategies addressing high costs, an insufficient number of up-to-date facilities, time limitations, etc. One cannot help but be concerned about whether the program will help with one's future job, and this was a secondary factor in determining whether students chose to participate in the program. That is why the development of adequate contents and teaching-learning strategies tailored to students' needs is a necessity. Furthermore, the needs and characteristics of students need to be looked into beforehand and reflected upon when designing and developing extra-curricular activities, because their needs can differ depending on gender and major.

Second, to increase university students' satisfaction with the extra-curricular activity participation, there should be a diversified analysis conducted on many factors such as enhancing learners' class participation, and providing authentic and practical knowledge and functions that affect the learners' satisfaction with extra-curricular activities in which they participate. Then it is necessary to reflect the result of the analysis when selecting better and more appropriate contents and

teaching-learning strategies. As reflected by the analysis of the summer camp program, university students' satisfaction with extra-curricular activities in which they participate can be differentiated by various factors. Therefore, an in-depth analysis on the factors affecting students' satisfaction appears to be necessary. It is required that the analysis results are applied more systematically when designing, developing, and running more effective, efficient, and attractive extra-curricular activities.

Third, similar to the satisfaction with the camp participation, to increase the satisfaction with the extra-curricular activity management, a multilateral and in-depth analysis should be considered further. For example, it is necessary to investigate further on teaching lesson materials and resource books, and on the following as well: the quality of instructors and their devotion to class; systematic, consistent, and regular programs; and providing appropriate and updated facilities and their correspondence to the goal of education. The results of such analyses should be promptly and systematically adapted to the extra-curricular programs as the programs continue throughout the years ahead. The suggestions made above may not be limited to only university students' extra-curricular activities. As examined in this study, the planning and implementation of extra-curricular activities that need up-to-date facilities, teaching resources and contents, more diversity, as well as additional factors should be analyzed in depth and multilaterally. It will be helpful to consider the results of this analysis to keep planning, developing, and conducting extra-curricular activities.

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Authors

Seak-Zoon Roh, PhD, is an Associate Professor of Education at Sungshin Women's University, Seoul, South Korea. He earned his PhD degree in Instructional Systems Technology from Indiana University Bloomington, USA. His research focuses on developing and implementing effective instructional design guidelines for distance education and high education, as well as Web accessibility.

Eunmi Chang, PhD, is CEO of Ziin Consulting Inc. and Adjunct Professor of Geomatics in University of Seoul, Seoul, Korea. She received her Ph.D degree in Physical Geography from the University of Kansas, USA. Her research ranges from environmental remote sensing, to natural hazard modeling and mapping, and business GIS.

Kyeong Park, PhD, is an Associate Professor of Geography at Sungshin Women's University, Seoul, South Korea. He earned his PhD degree in Physical Geography from the University of Kansas, USA. His research focuses on reconstruction of Quaternary paleo-environment of Korea and East Asia, as well as wetlands, coastal landforms, and toponymy.

