THE RESEARCH ON EFFECTS OF SCIENCE STUDENTS PARTICIPATION TO THE OPEN CAMPUS PROJECT

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Abstract - In this paper, focus on the Open Campus that the university conducts for entrance examination publicity and High schools - Universities connection, and examined from the results of the questionnaire survey about the effect of high school students learning who participated in the program and planning and operation by university students. Specifically, focus on student coordinate program ("Teach me Sensei!"). The program is from 2015 at Ehime University Faculty of Science. And a questionnaire survey for participants of the program and all participants in the open campus.As a result, in terms of learning of the participants, positive answers were more than 80% in all the 11 questions on for Fundamental Competencies for Working Persons. With regard to the items (items related to listening) that emphasized in the program, the result exceeded 90%. Although the program time was short, the results showing participants' high self-assessment were seen and it was considered that it could have provided the opportunity to raise the Fundamental Competencies for Working Persons. In the study on participation of university students at Open Campus program, significant differences were observed between 1% level in 2015 and 5% level in 2016 between the participants 'participation in the student project and the participants' overall responses. It became clear that the university student can participate in the programs and have opportunities to contact with the participants (High school students), thereby making it possible to raise motivation to go to the university more. As future tasks, in terms of learning of high school students, it is possible to conduct a survey. Prior to the start of the program, compare before and after the program, and follow up survey after the program is implemented. In addition, it is also necessary to investigate university students who participated the open campus and entered the Faculty of Science in that University.

Keywords - Competency of STEM student, Open Campus Project, Carrier education, STEM education

I. INTRODUCTION

In Japan, as the university is entering the era of full entrance, the around of university is changing drastically. Also in the report of [1], they clarified "Zest for living" and "Certain academic ability" as ability to be educated through university education, and change is also required from the viewpoint of High schools - Universities connection. High schools - Universities connection reforms are not only admission system reform but also improvement of the quality of high school education and qualitative change of university education [1]. As opportunities for universities to encounter high school students during concrete entrance exams, there are a wide range of opportunities such as delivery seminar and research program, cooperation in Super Science High school projects and Open Campus.

Among these opportunities, Open Campuses have been practiced for many years at many universities, and some universities have characteristics of each university, such as doing it on multiple schedules ([2], [3]). Many cases join with students in operation, various practices have been made to support students' administration and circle unit participation ([4], [5]). In addition, many studies have reported on the effect and participation of students participating in open campus project ([6]-[8]). Specifically, it is used as a practical example in the case of university students participating as a part of first year's education, training for Fundamental Competencies for Working Persons [9] and Key Competencies [10] and so on.

However, there are many examples of collaborating with students, companies and organizations in order to increase the schedule of open campus and to expand the contents, but what kind of effect was obtained by university students participating in the project, there are few reported cases. In addition, there are few cases of investigating what kind of learning has been learned by the programs offered to the participating high school students, and it is mainly focused on questionnaires about high school students participating and the degree of satisfaction of the program ([11], [12]).

Therefore, in this thesis, focusing on the student planning program at the open campus held by the Faculty of Science, Ehime University from 2015, and university students will be present at the open campus based on the survey results for the participants and the questionnaire results for all participants in the Faculty of Science Faculty Open Campus. It is aimed to verify the effect on participation and the educational effect on participants.

II. OVER REVIEW OF CASE

The Faculty of Science of Ehime University started a program that the students of manage until 2015. The purpose is to enrich Open Campus programs. This program is designed to be incorporated as one of the practices of career subjects (Science Communication Ⅰ etc.) that are offered for undergraduate students,

and the participation in program administration is a requirement for credit.

This subject has inherited the program for the first year university student course that has been implemented since 2011 and it has been reported that certain achievements have been made regarding the educational effect on the students [8].

Practice on Open Campus has different program time in 2015 and 2016. Students participated in the management “Oshiete Senpai!; Teach me University Students” and “ Lunch time Session ” in 2015. In 2016, “Oshiete Senpai!”, “Senpai to Katarou!; Let’s talk with University Students” and “Campus Tour”.

At the session of "Oshiete Senpai!", The students performed presentations on university life and conducted a workshop on planning about high school students is university life after entering Ehime University. There have been no changes in contents in 2015 and 2016.

In the "Lunch time session" session, students and high school students took lunch together, answered questions about university life from high school students and parents, and presented presentations on their own university life.

In the session of "Senpai to Katarou!", Students and high school students were divided into small groups, answered questions about university life from high school students and parents, and presented their own university life presentations.

In the “Campus Tour” of the Faculty of Science managed by part-time job students until 2015, but it was decided that these students attended the course from 2016. It is a tour around the laboratory and some classrooms etc.

III. METHOD

Open Campus Participated high school students answered some questionnaire survey. Questionnaire A is answered Participated "Oshiete Sensei!" program. Questionnaire B is answered all Open Campus of Science faculty Participated high school students. Questionnaire A is based on Fundamental Competencies for Working Persons and [12]. There were 11 questions in total, consisting of 4 methods: "I got it quite a bit", "I got to a certain extent" "I do not get much", "I do not have it at all" (7 out of 11 questions as [12]), which makes it possible to compare with the nationwide survey). In addition, surveys were conducted on the level of satisfaction with the program and the degree of achievement of the program's goals. The details of each question will be described separately when analyzing the results.

Questionnaire B is made by Science faculty. And consisting of 4 methods; the details of each question will be described separately when analyzing the results.

In this paper, we analyze based on the responses to the participants of " Oshiete Sensei!", a program that has been continuously implemented, and use the numerical values reported in [13] for the result of 2015. Table 1 shows the number of participants in each program and the number of respondents in each year.

Year	Number of participants (people)	Number of respondents (people)	Response rate
2015	154	154	100%
2016	90	90	100%

Table 1: Number of participants / respondents of the student management program

IV. RESULTS AND DISCUSSIONS

A. Educational effect on participating students

First of all, in order to confirm the difference due to aging of the program, pay attention to the achievement level for each target year (Table 2). I calculated the average with answer "strongly agree" as 4, "well think" as 3, "not so much" as 2, "absolutely disagree" as 1. Moreover, the achievement target degree (%) was calculated by dividing the sum of the number of respondents "strongly agree" and "well agree" by the total number of valid responses and setting it as a percentage.

Program objective	N		strongly agree		well think		not so much		absolutely disagree		Achivement	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
I can list two things I want to do after entrance to the university	142	80	67	36	64	37	10	5	1	2	92%	91%
I can think about what is necessary to realize what I want to do	142	80	55	39	76	36	10	5	1	0	92%	94%
I can presentation your action goals	141	80	49	33	67	36	24	8	1	3	82%	86%

Table 2: Achievement degree of the program objective

Regarding the achievement goal, since there is no big difference between the two years and since there is no statistically significant difference (t-test), participating students are different, but in terms of educational program the same quality of contents can be provided it. (Table 3)

Program objective	N		2015 Mean (SD)	2016 Mean (SD)	t	df	
	2015	2016					
I can list two things I want to do after entrance to the university	142	80	3.89(0.651)	3.34(0.711)	0.530	220	n.s.
I can think about what is necessary to realize what I want to do	142	80	3.30(0.630)	3.42(0.612)	-1.40	220	n.s.
I can presentation your action goals	141	80	3.16(0.723)	3.24(0.783)	-0.713	219	n.s.

Table 3: some year comparison of program objectives

Next, the results of the self-assessment on the Fundamental Competencies for Working Persons are summarized as shown in Figure 1.

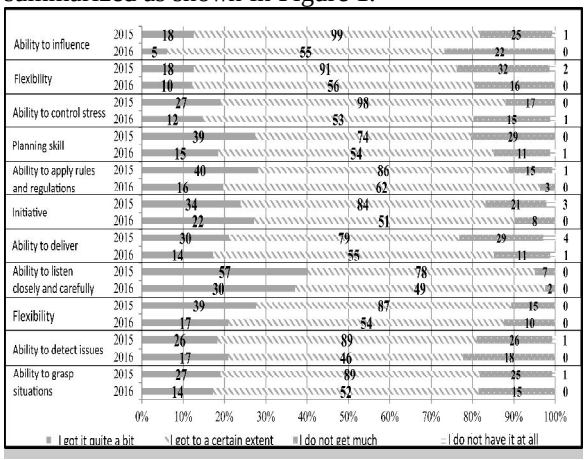


Figure 1:Self-assessment of Fundamental Competencies for Working Persons

In almost all items, positive answers of "I got pretty well" and "I got to a certain extent" exceeded 80%. In particular, regarding "Ability to listen closely and carefully (to carefully listen to the other party's opinion)", it exceeds 90% in both 2015 and 2016, which is considered to be a feature of the educational effect of this program.

In this program, many opportunities such as presentations by university students and presentations among participants are taken into consideration. In addition, motivation for listening to others was strongly carried out by facilitation of students who follow the moderator or the group.

On the other hand, the program has a lot of personal work time, and the deliverables are also personal living plan of the university, so the degree to learn about questions related to contents to discover problems, collaborate with others.

Therefore, the characteristics of the program of listening to the story of the other and individual works, and the relationship with the goal were observed. It seems that I could have provided opportunities to empowerment participants' Fundamental Competencies for Working Persons even under the condition of short time.

B. Effects of the participation of university students

Verify the effect of university students joined open campus program. Therefore, the results of the questionnaire survey carried out by the Faculty of Science of Ehime University for all open campus participants and the results of the program participants are compared.

Table 4 shows the questions and methods compared, the number of respondents, etc.

The question contents of question paper A and question paper B are the same, but since the question text and methods are different, care must be taken when comparing. On questionnaire A, "strongly agree" as 4, "I think so well" as 3,"I do not think so much" as 2, "I do not think at all" as 1, and in question paper B, "I want to learn by all means" as 4, "I want to learn" as 3, "I do not know yet" as 2, "I do not want to learn" as 1, an average value was calculated. From the results of the t-test comparing the surveys for each year, although equal variance could not be assumed for both cases, significant differences were observed at 1% level in 2015 and 5% level in 2016 (Table 5).

Target	Question	method	respondents 2015	respondents 2016
Program participants	Whether motivation to go to Ehime University's Faculty of Science has increased	・strongly agree ・so well ・not so much ・not think at all	148	81
All participants	Do you want to study at Ehime University in the future?	・I want to learn by all means ・I want to ・not know yet ・not want to learn	186	201

Table 4: Questions to compare and method

Year	Program Mean (N,SD)		All Mean (N,SD)	t	df	
2015	3.39(148,0.613)	>	3.19(186,0.753)	-2.65	332	$p < 0.01$
2016	3.30(81,0.603)	>	3.20(201,0.762)	-2.14	185	$p < 0.05$

Table 5: Effects of university students' participation

From the above, it was suggested that university students participate in the open campus, thereby giving positive effects to participants.

CONCLUSION

In this paper, I examined the effect of high school students participating in the open campus and the effect of university students participating in planning at the open campus from the results of the questionnaire survey.

As a result, although it was a short-term program, 1: it is possible to provide opportunities for improving "Fundamental Competencies for Working Persons" to participants, 2: Participation by university students to some programs; It was suggested that there was an effect of increasing motivation for admission.

On the other hand, much remains to be done. First of all, it is difficult to concretely assessments how much the participants 'ability has improved because only the participants' self-assessment on acquired data and the number of surveys is only one. In addition, 1: the question sentence different for the participants' questionnaire 2: whole questionnaire is anonymous, only program participants cannot be extracted.

However, there are many problems to be able to withstand quantitative examination, but from the qualitative aspect, it is clear from the survey results that by participating university students on open campus, there is a positive effect on participants.

From these results, it is suggested that the short program of open campus is also useful as a career education program in High schools - Universities connection, further development of open campus program is expected to proceed. In addition, by suggesting the possibility of promoting the participation of university students, it is possible to obtain a more effective advertisement publicity effect than in the case of faculty-staff-based programs, suggesting that open campus based on the involvement of faculty and staff will be applied to educational practices for university students It is expected that the development of the educational curriculum utilized as the place of the education will progress.

As future tasks, in terms of learning of high school students, it is possible to conduct a survey, etc. prior to the start of the program, compare before and after the program, and follow up survey after the program is implemented. In addition, it is also necessary to investigate university students who participated the open campus and entered the Faculty of Science in Ehime University.

Regarding the effect of university students' participation, there are multifaceted investigations that focus on not only participation of surveys in the form of identifying the presence or absence of participation, but also factors other than desire to enter university. Consideration should be given to the effect of the program itself based on the policy in the education field of the university. In addition, although this paper does not mention the training of participating students, verification from the viewpoint of expanding educational activities at universities that took part in the overall management, including the training of participating students and the involvement of faculty and staffs is also an important issue.

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REFERENCES

[1] Central Education Council Report, “Universal reform of high school education, university education and university entrance selection toward realization of a high connection that is suitable for a new era - all young people to bud new dreams and goals, to make them flower in the future - (report)”, Ministry of Education, Culture, Sports, Science and Technology, 2014 (Japanese).

[2] Hiromi Koga, “ A Study in Careers Education : Incorporating 'Open Campus' Sessions into the Support Program for Freshmen ”, Kaetsu University research review，51(1)，145-161, 2008 (Japanese).

[3] Akiko Ikeshima, Mitsuharu Yokoi, Keiko Iwai, “ The Effectiveness of Open Campus programmed Human Relations ”, The Annual Bulletin of Junior College, Osaka University of Health and Sport Science，8，85-99, 2007 (Japanese).

[4] Hirotaka Oki, “ Developing Student Staff at Universities: A New Category for Student Engagement ", Nagoya Journal of Higher Education，15，5-22, 2015 (Japanese).

[5] Yoshimi Hashimoto, Mariko Suzuki, Takamasa Tanaka, Fuki Horiuchi, Kishi Keiko Imai “ The open campus as the informal college education :For developing students ’ socialization skills ”, Saku University Journal of Nursing，3(1)，53-60, 2011 (Japanese).

[6] Mina Katsuda, “Research of guidance program to activate exchanges of open campus participants”, Child studies，8，61 -74, 2016 (Japanese).

[7] Hironobu Takeda, “Introductory Education in the Department of Career Design, and Leadership Development Was Joined by University Event”, Research bulletin of Osaka Shoin Women's University, 2，231-237, 2012 (Japanese).

[8] Tomotaka Kuroda, “Social Skills Development Program based on Science Education”,Nihon Kagaku Kyoiku Gakkai nenkai ronbunshu, 40，237-238, 2016 (Japanese).

[9] Ministry of Economy, Trade and Industry, “Study Group on Fundamental Competencies for Working Persons - "Interim Report"”, Ministry of Economy, Trade and Industry, 2006 (Japanese).

[10] Dominique Simone Rychen, Laura Hersh Salganik, “Key Competencies for a Successful Life and a Well-Functioning Society. Boston : Hogrefe & Huber Pub, 2003.

[11] Takashi Kubota, Rie Tanaka, “A survey of high school students to participate in open campus of the Faculty of Education”, Bulletin of the Faculty of Education, Yamaguchi University，63，47 -54, 2014 (Japanese).

[12] Benesse Corporation, “The 2nd Survey Report on Learning and Living Conditions of University Students”, Benesse Corporation, 2013 (Japanese).

[13] Tomotaka Kuroda, “A Study on the Effects of Students' Open Campus Projects - Focusing on Self-assessment of Fundamental Competencies for Working Persons –”,Shonenji kyouiku Gakkai taikai ronnbunshu, 9, 120-121, 2016 (Japanese).

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