Analyzing University Course Evaluation: Comparison of High and Low Performing Faculty Members

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Abstract: The purpose of this study is to explore the way to improve the university class by utilizing the result of student course evaluation. The research questions are as follow: 1) Does result of course evaluation differ according to faculty member's position, course size, subject area, and course type? 2) What are the differences between high and low performing faculty members' courses? This study showed that there were statically meaningful differences among position of faculty member, course size, subject area, and course type. Also, there were gaps in the score of course satisfaction, course outcome, evaluation and utilization, and interaction questions between top and bottom 20% scored courses. This study could be used to develop and operate the teaching program for faculty and support university policy.

Keywords: Course evaluation, High and low performing faculty members, University class

INTRODUCTION

Course evaluation is an educational decision-making to collect the information on teaching and learning activities of instructor and to judge the value of educational program by using valid evaluation tool for improving the quality of course(Oh, 2015). In the case of Korean university, the introduction of course evaluation was discussed publicly in 1980s, and then university introduced and implemented the evaluation system in early 1990s. Now, all most of universities are implementing the system to enhance the quality and stability of university education(Lee, 2013).

The purpose of course evaluation is not to measure simple score, but to discover problem or improvement opportunity of course and to enhance teaching activities of instructor for improving learning of students. Also, course evaluation is implemented to analyze the efficiency of course and teaching ability of instructor and utilized as a data for making decision for policy at the university level such as personnel matters and performance evaluation(Han, Kim, & Lee, 2005). Thus, analyzing the result of course evaluation can achieve formative and summative purposes of course evaluation.

However, it is general to utilize a result of course evaluation simply without analyzing and doing a research on the result. For example, the result of course evaluation is mainly utilized to select high and low-performing faculty members. Also, the result can be accessed in educational administrative system, but it is presented as a type of number or score. It is not easy for instructors to judge what the number has a meaning and how they can improve their courses. Therefore, it is essential to conduct multi-faceted analysis on result of course evaluation to make instructor do practical application of result and to improve the quality of course and student satisfaction.

The purpose of this study is to execute multi-faceted analysis on the result of course evaluation, which is implemented at the end of term, for developing and operating teaching program and seeking direction of university-level policy. This study was conducted to analyze the result by characteristics of instruction and questions and to suggest detailed way to improve course. To this end, the following research questions have been made:

1) Does result of course evaluation differ according to faculty member's position, course size, subject area, and course type?
2) What are the differences between high and low performing faculty members' courses?

THEORETICAL BACKGROUND

Purpose and necessity of course evaluation

According to previous researches related to university course evaluation, the purpose of course evaluation is, most of all, to provide information for problem recognition and improvement through the teaching activity feedback system, leading to the direction of teaching and learning activities. In order to improve the quality of teaching activities within the classroom environment, it is necessary to carry out the evaluation for a 'formative' purpose. In addition, in order to utilize it as the decision-making data for the efficient management of the organization at the

organizational level of the university, the course evaluation is carried out on 'summative' purpose.

The university has a positive effect on the improvement of the course by making use of the course evaluation and changing the teaching behavior(Ha, 2017; Ha & Jung, 2013). Additionally, the evaluation system can provide a pathway for students to participate in educational activities(Lee & Min, 2013), which are expected to be easy to achieve the formative purpose of evaluation.

However, according to a survey by Han, Kim, & Lee(2005), nearly 100 universities(93%) were conducting course evaluation online (Baek & Shin, 2008). Also, most of the students responded to the degree of satisfaction with the specific statements of the course evaluation questionnaire on the basis of the Likert scale(Kwon, 2008). Moreover, the present course evaluation tool does not achieve the formative purpose of course evaluation due to the compulsory course evaluation method and the students' unfaithful response although consisting of several questions by areas in order to measure various areas of the course(Ha & Jung, 2014). In this way, there is a research result that recognizes limitations due to limited information transmission in course evaluation, and concrete information related to improvement of courses is obtained through narrative type item(Ha & Jung, 2014). It was suggested that the answers to the descriptive questions would be a good way to achieve the formative purpose of course evaluation.

Providing quality course is one of the main functions of the university, and the quality of the teaching is one factor that can judge the efficiency of the school organization. Also, it is necessary to do the course evaluation for the managerial level of the organization beyond the pedagogical dimension (Ryu & Lee, 2002). This is the basis for conducting course evaluation for summative purpose, and evaluating the value, effectiveness, and efficiency of the education program is used as the information on decision making about whether the program is sustainable, promotion of professor, reappointment, retirement guarantee (Baek & Shin, 2008).

In order to improve the quality of university education, course evaluation is required to develop more professional and educational items for course evaluation items to ensure efficiency and credibility (Lee, 2013). In addition, one of the tendencies in the case of the course evaluation of foreign universities is that the course evaluation is conducted by dividing the purpose of the professor's achievement evaluation and the improvement of the course (Han, Kim & Lee 2005). As Lee & Min(2013) have said, the evaluations of formative purpose and of summative purpose clearly differ in terms of utilization of results, and it is desirable to clearly define an intention to evaluate how to use the results of the evaluation, and then decide on the method of evaluation based on the intention.

Factors affecting the course evaluation

The course evaluation is produced by a combination of various factors, and the factors affecting the course evaluation are derived from prior study analysis. It is common to divide the factors into three areas: professor-related area, student-related area, and class-related area. Yang, Kim, Kim, & Park(2011) presented four areas : professors(personal characteristics such as attitudes, positions, gender, major, academic achievements, etc.), students(attitudes and background characteristics of motivation, class participation, grade, gender, major, etc.), subjects(contents level, subject area, department opening year, etc.), environment(size of course, seating, classroom size, teaching tools, etc.). The two systems differ in that they have separated class related area into subjects and environmental.

The following table summarizes the factors affecting the course evaluation results in the prior study.

Table 1. Influencing factors of the course evaluation results

Variable		Researcher
Student-related	age/grade	Gage(1961) Heo(1999) Lee(1999) Ting(2000) Han(2001) Yang(2014) Park(2018)
	credit/score	Costin, Greenough & Menges(1971) Brown(1976) Han(2001) Yang(2014) Park(2018)
	attendance rate	Lee(1999) Ryu & Lee(2002) Yang(2014)
	rate of participation in evaluation	
	gender	Bennett(1982) Basow & Silberg(1987) Lee(1999) Han(2001) Yang(2014) Park(2018)
	department/ major (college)	Lee(1999) Han(2001) Choi & Kim(2013) Yang(2014) Park(2018)
	volunteerism for the course evaluation	Lee(2005)
	The diversity of students	Stewart(1995) Ting(2000)

Variable		Researcher
	an insincere response	Choi & Kim(2013) Yang(2014)
	military writing status	Ryu & Lee(2002) Yang(2014)
Professor-related	gender	Elmore & LaPointe(1974) LaPointe(1974) Marsh, Hau, Chung & Siu(1997) Han(2001)
	position	Feldman(1983) Marsh(1987) Lee(1999) Han(2001) Ting(2000) Park(2018)
	age	
	major	Feldman(1978) Braskamp & Ory(1994) Ting(2000) Han(2001) Park(2018)
	research activities	Salings & Singhal(1970) Alemon i& Yimer(1973) Marsh(1984) Han(2001)
	volunteer activity	
Class-related	course size(number of students)	Aleamoni & Graham(1974) Elmore & Pohlmann(1978) Marsh(1984) Sheck, Kinichi & Webster(1994) Akerheim(1995) Marsh, Hau, Chung & Siu(1997) Han(2001) Yang(2014) Park(2018)
	course type	Sheck, Kinichi & Webster(1994) Han(2001) Yang(2014) Park(2018)
	subject area	Lee(1999) Ting(2000) Han(2001) Cho(2010) Yang(2014) Park(2018)
	difficulty of a course	Overall & Kesler(1979) Marsh(1984) Craton & Smith(1986) Han(2001) Yang(2014)
	generosity of giving credit	Greenwald & Gillmore(1997) Han(2001)
	attendance importance, test importance	Han(2001)
	task importance	Marsh(1983) Han(2001)
	application of teaching methods	Lee(1999) Han(2001)
	course activity	Lee(1999)

As mentioned in the introduction, this study sought to explore the development, operation, and policy direction at the university level for enhancing the quality of university course. When extracting factors that affect the course evaluation, it was decided that the analysis of the class-related factors should be focused rather than on student-related factors. Therefore, we extracted the class size, education classification, and class type, which were widely treated as a class-related factor in the prior study. In addition, the position of professor was extracted as one of main professor-related factor, which was specifically mentioned in the prior study.

Han(2001) said the courses need to be distinguished by class characteristics to ensure fairness when comparing the result of course evaluation. In other words, courses in the humanities and natural engineering fields, courses consisting of large-scale and small-scale courses, instructor-led courses and practice should be sorted and evaluated. In class-related factors of this study, prior studies about class type factor mostly treated instructor-led classes and practice classes factors. Course type of cyber lecture was not covered in prior studies. Reflecting a trend of online and mobile courses, this study sorts theory(lecture)-centered, experiment and practice–centered, practical skill-centered, and cyber lecture to identify factors for the types of course that affect the course evaluation.

METHODS

Subjects

This study used 66,787 responses of course evaluation from 2,748 courses which had been targeted as course evaluation of S university in 2017. Table 2 presents the descriptions of course by related variables.

Table 2. Course profile

Variable	Number of Courses	Percent

Variable		Number of Courses	Percent
Position	Professor	696	25.3
	Associate professor	126	4.6
	Assistant professor	1,262	45.9
	Part-time lecturer	461	16.8
	Part-time faculty	203	7.4
Course size	Small	961	35.3
	Medium	1,474	53.6
	Large	303	11.0
Subject area	General (required)	265	9.6
	General (elective)	467	17.0
	Major (required)	168	14.1
	Major (elective)	736	53.2
	Education (required)	20	1.9
	Education (elective)	57	4.1
Course type	Theory(lecture)-centered	1,919	69.8
	Experiment and practice-centered	332	12.1
	Practical skill-centered	438	15.9
	Cyber lecture	59	2.1

Instrument

Course evaluation was measured by using survey items developed from S university in 2015. The survey consisted of 8 objective items regarding 'course system', 'devotion to course', 'course method', 'interaction', 'course material', 'assessment and utilization', 'course satisfaction', and 'course outcome', 2 subjective items regarding students' opinion about strong and weak points of course, and 1 short-answer item regarding students' opinion about competency enhanced during the course. In this study, the objective items with 5-point Likert scale were analyzed. The Cronbach's alpha coefficient of this instrument was .980.

Data collection and analysis

The survey of course evaluation was conducted at the end of term. Data were collected thorough educational administration system of S university. For the research questions, the statistical analysis program SPSS Statistic 23 was used to calculate descriptive statistics and conduct one-way ANOVA in attempts to understand the relationship between the score of course evaluation and course-related variables. In order to check variance homogeneity, Levene test was performed and it was seen that variances are not homogeneous in all variables. Therefore, Games-Howell test was performed as a post hoc test. Also, to compare high and low performing faculty members, top and bottom 20% scored courses were subdivided as it is general to identify low performing faculty members through specific standard utilizing bottom 20% of the score.

RESULTS

Descriptive analysis

As shown in Table 3, mean of overall course evaluation was .426 (SD=.855). Mean of course system was 4.27 (SD=.889), mean of devotion to course was 4.33(SD=.855), mean of course method was 4.28(SD=.886), mean of interaction was 4.25 (SD=.923), mean of course materials was 4.28 (SD=.894), mean of assessment and utilization was 4.24(SD=.930), mean of course satisfaction was 4.20 (SD=.982), and mean of course outcome was 4.24 (SD=.934).

Table 3. Means and standard deviation

	Mean	SD
Course system	4.27	.889
Devotion to course	4.33	.855
Course method	4.28	.886
Interaction	4.25	.923
Course materials	4.28	.894
Assessment and utilization	4.24	.930
Course satisfaction	4.20	.982
Course outcome	4.24	.934
Overall	4.26	.855

Differences in course evaluation by related varialbes

Differences in course evaluation by faculty member's position

There were significant differences among the faculty member's positions in regards to the result of course evaluation (F=85.811, p<.001). Post-hoc test(Games-Howell) showed that associate professor had higher scores in the evaluation than other positions, and assistant professor, part-time lecturer and faculty got higher result than professor.

Table 4. ANOVA result according to position

Position	M	SD	F	p	Post hoc test
Professor (a, n=20,278)	4.21	.888	85.811	<.001	b>c,d,e>a (Games-Howell)
Associate professor	4.48	.717			

Position	M	SD	F	p	Post hoc test
(b, n=2,715)					
Assistant professor (c, n=30,270)	4.28	.835			
Part-time lecturer (d, n=9,347)	4.27	.869			
Part-time faculty (e, n=3,870)	4.25	.856			

Differences in course evaluation by course size

There were significant differences among course size in regards to the result of course evaluation (F=411.598, p<.001). Post-hoc test(Games-Howell) showed that faculty members who did small-sized course had higher scores in the evaluation than the members who did medium-sized one, and the members who did medium-sized course got higher result than the members who did large-sized one.

Table 5. ANOVA result according to course size

Course size	M	SD	F	p	Post hoc test
Small (a, n=8,932)	4.46	.843	411.598	<.001	a>b>c (Games-Howell)
Medium (b, n=37,644)	4.33	.878			
Large (c, n=20,210)	4.15	.976			

Differences in course evaluation by subject area

There were significant differences among the subject areas in regards to the result of course evaluation(F=418.198, p<.001). Post-hoc test(Games-Howell) showed the faculty members who did education(teaching profession) required and elective course had higher scores in the evaluation than the members who did the courses of other areas. The average of major required course is higher than the average of major elective one. In addition, the average of major elective course is higher than the averages of two areas in general education. In the case of general education, the average of general elective course is higher than the average of general required course.

Table 6. ANOVA result according to subject area

Subject area	M	SD	F	p	Post hoc test
General required (a, n=5,701)	4.06	.895	418.198	<.001	e,f>c>d>b>a (Games-Howell)
General elective (b, n=20,749)	4.10	.909			
Major required (c, n=8,538)	4.39	.797			
Major	4.35	.806			
elective (d, n=27,150)					
Education required (e, n=1,965)	4.56	.724			
Education elective (e, n=2,377)	4.53	.746			

Differences in course evaluation by course type

There were significant differences among course types in regards to the result of course evaluation (F=119.492, p<.001). Post-hoc test(Games-Howell) showed that faculty members who did experiment and practice- and practical skill-centered course had higher scores in the evaluation than ones who did theory(lecture)-centered course, and they got higher result than faculty members who did cyber lecture.

Table 7. ANOVA result according to course type

Course type	M	SD	F	p	Post hoc test
Theory(lecture)-centered (a, n=47,811)	4.27	.856	119.492	<.001	b,c>a>d (Games-Howell)
Experiment and practice-centered (b, n=5,299)	4.32	.814			
Practical skill-centered (c, n=7,530)	4.32	.813			
Cyber lecture (d, n=5,840)	4.06	.909			

Camparison between high and low performing faculty members' course

It was found that several variables showed bigger gap between the percentages of high and low performing faculty members' course. Associate professor position, small-sized course, Major required and education(teaching profession) area, practical skill-centered course type took more 10 percentage of high performing faculty member's course. By contrast, large-sized course, general education area, cyber lecture type took more 10 percentage of low performing faculty member's course. Professor position took more 5 percentage of the course which got bottom 20 percentage of course evaluation.

Table 8. Characteristics of top and bottom 20% course

Variable			Top 20%	Bottom 20%
Positi	Professor	N	120	160

Variable			Top 20%	Bottom 20%
on	(n=695)	% within position	17.2	23.0
	Associate professor (n=126)	N	52	6
		% within position	41.3	4.8
	Assistant professor (n=1,262)	N	248	265
		% within position	19.7	21.0
	Part-time lecturer (n=461)	N	106	91
		% within position	23.0	19.7
	Part-time faculty (n=203)	N	36	35
		% within position	17.7	17.2
Cour se size	Small (n=971)	N	311	171
		% within size	32.0	17.6
	Medium (n=1,474)	N	237	289
		% within the size	16.1	19.6
	Large (n=303)	N	14	97
		% within the size	4.6	32.0
Subj ect area	General required (n=265)	N	27	112
		% within the area	10.2	42.3
	General elective (n=467)	N	15	149
		% within the area	3.2	31.9
	Major required (n=387)	N	104	57
		% within the area	26.9	14.7
	Major elective (n=1,462)	N	356	225
		% within the area	24.4	15.4
	Education required (n=53)	N	16	1
		% within the area	30.2	1.9
	Education elective (n=114)	N	44	13
		% within the area	38.6	11.4
Cour se type	Theory-centered (n=1,919)	N	373	406
		% within the type	19.4	21.2
	Experime nt and practice-centered (n=332)	N	70	63
		% within the type	21.1	19.0
	Practical skill-centered (n=438)	N	117	66
		% within the type	26.7	15.1
	Cyber lecture (n=59)	N	2	22
		% within the type	3.4	37.3

It was found that gap between average of high and low performing faculty members' course evaluation was 1.01. Compared to overall gap, Course satisfaction(1.13), course outcome(1.07), assessment and utilization(1.04), and interaction(1.03) had a bigger gap between means of top and bottom 20% scored courses.

Table 9. Comparison between means of top and low 20%

	Top 20%	Bottom 20%	Gap (a-b)
	M(a)	M(b)	
Course system	4.79	3.80	0.99
Devotion to course	4.80	3.93	0.87
Course method	4.80	3.81	0.98
Interaction	4.79	3.75	1.03
Course materials	4.79	3.80	0.99
Assessment and utilization	4.78	3.74	1.04
Course satisfaction	4.78	3.65	1.13
Course outcome	4.79	3.72	1.07
Overall	4.79	3.78	1.01

DISCUSSSION

This study sought to execute multi-faceted analysis on the score of course evaluation, the key outcome of teaching and learning at the university, and to make a detailed plan for teaching program enhancing the quality of course and for university-leveled policy. This study found that there were meaningful differences among the groups divided by faculty member's position(professor, associate professor, assistant professor, part-time lecturer, part-time faculty), course size(small, medium, large), subject area(general, major, education required & elective), and course type(theory-centered, experiment and practice-centered, practical skill-centered, cyber lecture). (1) Associate professor had the highest score and professor got the lowest score on the course evaluation. Associate professor had higher result than other faculty members' positions, and assistant professor, part-time lecturer and faculty did higher score than professor. (2) Small-sized course had higher score than medium sized one which got higher result than large-sized course. This result is consistent with the study of Yang(2014) that revealed that small-sized course, which the number of students was below 20 or 30, had higher result on course evaluation. (3) Education(teaching profession) required and elective course got higher score than other subject areas' course. Major required course had higher than major elective one which got higher than two areas of general course. In general course, the elective course had higher result on the evaluation than required one. This result is in agreement with the study of

Park(2018) which teaching profession course had higher score than major course. (4) Experiment & practice- and practical skill-centered courses got higher score than other types of course, and theory(lecture)-centered course had higher result than cyber lecture. This result does not support previous research(Park, 2018), but it is difficult to make consistent decision on course type's direction which influences the result of course evaluation(Yang, 2014).

This study also found that there were different characteristics and gaps between high and low performing faculty members' courses. High performing faculty members' courses had teaching by associate professor, small size of course, education(teaching profession) subject area, and practical-skill centered course type as main characteristics distinguished from bottom 20% scored courses. Low performing faculty member's courses had teaching by professor, large size of course, general course area, and cyber lecture. Moreover, there were gaps of average points between high and low performing faculty members' course. Course satisfaction, course outcome, assessment and utilization, and interaction showed a bigger gap than average. It is essential to consider these characteristics to support low performing faculty members with the result of previous research(Choi, Kwon, Kim, & Park, 2018) that revealed that it is helpful to consider student's interest in course, course difficulty, faculty member's devotion to students, and interaction to get better result of course evaluation.

This study provides a few implications for developing and operating teaching program and university leveled policy. First of all, customized program for faculty member's teaching should be developed and operated. Teaching programs, such as community of faculty members and workshop, considering their characteristics need to be supported by university policy. Compared to associate and assistant professors as a position, participation of teaching program, one of standards of performance evaluation, is not relatively important to professor, who has a tenure-track. It will be helpful to operate special incentive program based on teaching program for attracting participation of faculty members. Also, special program for faculty members who teach general course should be operated. The program will be university- or professional organization operated one such as Korea National Institute for General Education. Second, cyber lecture(e-learning course) should be improved. Cyber lecture relatively has weak interaction which showed a bigger gap between high and low performing faculty members' courses. All types of interaction, which includes professor-student, student-student, and student-content, should be considered. For example, it is helpful to do webinar and tutor system(traditional interaction between teacher and student), institutionalization of online discussion among students as one of grading standards, Collaboration for problem-solving, and peer evaluation and monitoring (student-student interaction), and utilizing a variety of multimedia material, connecting students with academic sources and experts(student–content interaction). Third, university policy for better education should be based on characteristics of high performing faculty members' courses. It is necessary to include more experiment and practice- and practical skill-centered course in the curriculum. Also, university needs to consider that the minimum number of students for opening course is below 20 as a policy for increasing the number of small-sized course and enhancing the quality of education offered to students.

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