

The Relationship between University Specialization and the Characteristics of Different Academic Majors in South Korea

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Abstract

The purpose of this study is to investigate the relationship between the characteristics of different academic fields and the outcomes of promoting university specialization. In particular, this study sought to analyze how the actuality of university specialization was achieved according to the university's characteristic of offered academic fields. The research results show that the academic field of engineering had great specialization performance results, with a specialization tendency to gradually progress towards convergence. In addition, the university characteristic variables that influence the results of university specialization promotion are influenced by size and location, and the influence of university specific variables on the results of university specialization appear differently depending on the academic fields. In Korea, the outcome of promoting university specialization in South Korea appeared differently depending on the establishment type of university (public or private), the location of university, and size and scale. There needs to be strategic approaches for university specialization customized to the university specific characteristics and variables.

Keywords: *University characteristic, Academic discipline, Higher education, University specialization*

1. Introduction

Currently, South Korean universities are promoting university specialization to receive financial support from the government, and the government is also implementing various support projects for universities to encourage specialization. As university specialization contributes to national competitiveness, it is not only promoted within South Korea but many other developed countries to enhance the strengths of universities [1][2].

Although university specialization has been long emphasized in South Korea and implemented by universities to enhance their diverse and individual strengths, it is difficult to measure and evaluate the actual overall status of specialization [3][4]. Therefore, before any discussion or debate, it is necessary to consider the achievements and outcomes of specialization promotion. In particular, it is necessary to conduct

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empirical research on whether specialization projects have a positive effect on improving the competitiveness of a university [5][6][7]. Considering such research trends, a recent study by Suk-Yeol Lee and Ho-Seob Lee [8] analyzed the factors influencing the performance outcomes of promoting university specialization, testing the effectiveness of university specialization policy. The result of the analysis demonstrated that university specialization does not significantly influence university education outcomes, although it has various impacts on different academic fields. However, the study considered different features of universities, such as their foundation status, location, and number of students, as control variables; thus, it did not conduct an empirical analysis on how these factors of different features of universities interact with one another, nor the role of the characteristic of different academic field on university specialization.

Therefore, this study investigates the relationship between the characteristic of different academic disciplines and outcome performance of promoting university specialization. In other words, the study analyzes how university specialization was achieved depending on the characteristic of different academic fields

2. Research methodology

To achieve the objectives of this study, data on university specialization of 4-year universities in Korea during 2010-2013 was analyzed. The data and materials on the outcomes of promoting university specialization, current status reports on university specialization provided by the Higher Education in Korea website, are comprised of the characteristics of the outcomes of university specialization are the number of fields promoted for specialization, the number of specialization projects, the number of financial support programs, and the amount of financial support for specialization related programs (Unit: 1,000 KRW) The university-specific characteristics that were selected for this study are the region location (capital metropolitan region, central region, provincial regions, other municipalities), establishment type (public, private), scale (Very Small: Less than 1,000 students; Small: Between 1,000- 5,000 students; Medium: Between 5,000-10,000 students; Large: More than 10,000 students) duration of specialization promotion (Unit: Year) [8].

3. Research outcome

3.1. Analysis of the difference in university specialization projects implemented in different academic fields

An analysis was conducted to find the features of universities that affect the implementation of specialization projects in different academic fields. The academic fields for the aforementioned comparative analysis are depicted in [Table 1]. The humanities and social sciences and engineering were found to have the highest average at 0.60, followed by the natural sciences 0.43, convergence at 0.34, art, music, and physical education at 0.18, and medical science at 0.11. Since 2010, engineering and the humanities and social sciences are the academic fields with the highest number of areas of specialization.

[Table 2] depicts the numbers of university specialization project groups for different academic fields. The number of specialization projects is highest at 1.51 for engineering, followed by the humanities and social sciences, at 1.23, the natural

sciences at 0.79; convergence and other fields at 0.61; art, music, and physical education with 0.23, and medical science with 0.12. Although the numbers of university specialization project groups for art, music, and physical education and for medical science are continuing to decrease, the field of engineering has increased since in 2013, except in 2013 when the number reduced to the levels seen in 2010. Overall, the number of areas of specialization and number of specialization project groups are higher for the engineering field compared to other fields.

Table 1. Current status of university specialization by academic field

Year	Humanities and Social Sciences		Natural Sciences		Engineering		Art, Music, and Physical Education		Medical Science		Convergence and Others	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
2010	.53	.50	.41	.49	.55	.50	.21	.41	.13	.34	.46	.50
2011	.65	.48	.50	.50	.63	.49	.20	.40	.11	.31	.22	.42
2012	.60	.49	.42	.50	.59	.49	.15	.36	.10	.30	.35	.48
2013	.63	.49	.41	.49	.63	.49	.16	.36	.09	.29	.34	.47
Total	.60	.49	.43	.50	.60	.49	.18	.38	.11	.31	.34	.48

Table 2. Current status of specialization projects by academic field

Year	Humanities and Social Sciences		Natural Sciences		Engineering		Art, Music, and Physical Education		Medical Science		Convergence etc.	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
2010	1.14	1.91	.76	1.13	1.43	1.96	.27	.60	.14	.37	.87	1.26
2011	1.31	1.83	.85	1.39	1.61	2.10	.28	.65	.13	.43	.33	.75
2012	1.28	1.93	.88	1.87	1.68	3.14	.19	.52	.12	.47	.61	1.31
2013	1.19	1.54	.66	1.29	1.34	1.64	.18	.45	.09	.29	.63	1.06
Total	1.23	1.81	.79	1.44	1.51	2.27	.23	.56	.12	.39	.61	1.13

The scale of governmental financial support for university specialization projects is presented in [Table 3]. Unlike the tendency shown by the number of specialization project groups and the number of specialization areas by academic field, the amount of government financial support for university specialization projects is higher for other fields compared to the humanities and social sciences. The engineering field has the second highest value at 7,544 million won, following the value for convergence and other fields, which is the highest at 7,963 million won. The value for humanities and social sciences is 1,540 million won, and the lowest is for art, music, and physical education at 356 million won. The value of financial support for convergence and other fields has been the highest since 2012. The engineering field has received the most government financial support on average for the past four years yet the value for convergence and other fields has seen the greatest increase in the past two years. This trend is due to government investments being concentrated on specialization projects

for convergence centered on engineering. Therefore, it can be seen that the nature of financial support projects for specialization in the engineering field is changing.

Table 3. Current status of government financial support for university specialization by academic field

Year	Humanities & Social Sciences		Natural Sciences		Engineering	
	M	SD	M	SD	M	SD
2010	886	1,432	2,401	3,926	7,514	10,762
2011	1,681	5,147	2,956	4,344	6,56	78,649
2012	1,904	2,815	4,539	7,147	9,156	12,937
2013	1,622	2,841	6,236	8,758	7,09	49,350
Total	1,540	3,431	3,941	6,351	7,544	10,466
Year	Art, Music, and Physical Education		Medical Science		Convergence and Other Fields	
	M	SD	M	SD	M	SD
2010	255	380	4,868	6,480	4,363	5,202
2011	454	700	7,241	6,394	5,489	9,585
2012	465	541	6,754	7,710	11,378	27,187
2013	263	259	7,144	9,055	11,341	23,573
Total	356	508	6,370	7,196	7,963	18,587

[Table 4] depicts the numbers of university specialization project groups that have been financially supported by the government. The number is highest for the engineering field, at 21.26. It is 17.77 for convergence and other fields; 14.4 for medical science; 12.73 for natural sciences; 5.85 for humanities and social sciences; and 2.59 for art, music, and physical education. The number of university specialization project groups financially supported by the government has been constantly increasing or remaining at a similar level since 2010. This tendency indicates a change in the focus of university specialization, which has been moving from engineering toward convergence and other fields since 2012.

Table 4. current status of government supported university specialization projects by academic field

Year	Humanities and Social Sciences		Natural Sciences		Engineering		Art, Music, and Physical Education		Medical Science		Convergence and Other Fields	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
2010	2.17	2.55	6.66	8.89	14.21	17.97	1.24	1.23	7.31	7.68	10.64	12.49
2011	4.91	8.35	10.47	13.91	17.67	23.06	2.87	3.42	18.23	13.04	11.74	13.93
2012	7.66	9.78	15.45	22.88	26.75	33.64	3.41	2.92	15.64	14.47	21.13	22.94
2013	8.40	8.80	19.34	26.16	26.00	27.93	3.11	1.75	18.91	12.91	28.74	33.51
Total	5.85	8.29	12.73	19.27	21.16	26.64	2.55	2.59	14.39	12.59	17.77	23.08

4. Conclusions and discussions

This study examined the results of promoting university specialization programs according to the university specific variable of different academic fields and disciplines. The research results of analyzing the current status of university specialization promotion show higher specialization in the academic disciplines of engineering, the humanities and social sciences compared to other fields. In addition, the number of specialization projects was higher for engineering than other fields. Although the scale of governmental financial support for specialization projects is higher for the engineering field than other fields, recently, the financial support and assistance for convergence and other disciplines is becoming the highest as the government concentrates investment on university specialization projects in convergence focused on engineering. Similarly, the number of government funded specialization projects is higher for the engineering field compared to others, yet recently, the number for convergence and other fields is becoming the highest. These trends indicate the implementation of university specialization in South Korea mainly focuses on the engineering field, and convergence is being implemented centered on engineering majors and departments. In conclusion, the result of the analysis demonstrates that the sciences and engineering is an important pillar for university specialization in Korea.

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