A study on the analysis of satisfaction with liberal arts education based on core competencies of H University

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ABSTRACT

Purpose: The purpose of this study is to investigate the satisfaction of liberal arts education of H University students to identify the correlation between each other and to design a new liberal arts curriculum as an analysis result.

Findings: The purpose of this study is to design the general education of H University for the future year by analyzing the satisfaction with the general education of H University. First, in the results of analyzing major items of general education, the general education programs showed high satisfaction while the administrative area showed a bit low satisfaction. Second, students' learning activities and professors of general education showed the highest satisfaction while the qualitative level of general education courses, guidance and advice of general education support facilities showed the lowest satisfaction in the results of analyzing detailed items of general education. Third, it is the demand for new general education courses. The new general education courses were classified into areas of progressiveness, coexistence and inquiry.

Conclusion: Therefore, H University has increased the satisfaction of the administrative domain, improved the quality level and developed a new curriculum based on demand. There is a need for improvement in the opening.

Keywords: *General education curriculum, General education, Liberal arts education, Satisfaction with general education, The 4th industrial revolution, University liberal arts education.*

1. INTRODUCTION

1.1. Necessities and Purposes

The COVID-19 pandemic and the 4th industrial revolution have brought about many changes in politics, economy, society, culture, and education. The COVID-19 pandemic played an important role in changing Korean education familiar with face-to-face group education to online education. This change also caused many changes in university education which is the introductory stage for the entry into society.

Universities were asked for an active coping ability and naturally started meeting changes in rapid social changes such as the 4th Industrial Revolution and the COVID-19 pandemic. Thus, the current universities are asked to understand the needs and satisfaction of students as consumers and then to reflect them into curriculum to increase the propriety and effectiveness of general education. In other words, it would be necessary to conduct a survey on the satisfaction and needs of students who are consumers of education and participants in general education and then to reflect the results into the general education curriculum (Kim, 2022). This change process clearly changed two things in universities. First, it is the expansion of general education in the ratio to major education. The ratio of general education compared to major education should be expanded to respond to rapid social changes. In the past, general education was supplementary to major education, so the ratio was around 20%. However, the ratio of general education courses compared to major courses is around 55% at Harvard University of the United States and the ratio of general education courses compared to major courses has been expanded to 41.4% at Peking University of China in the current status of general education (Yun & Lee, 2018). Second, it is active coping with changes. Even though it is difficult to perfectly cope with great shocks like the COVID-19 pandemic and the 4th Industrial Revolution, if we get prepared, the risks can be lowered. There should be education for abilities to sense social changes and

to actively cope with them with such changes. Thus, universities tend to be gradually increasing courses about disaster safety like the COVID-19 pandemic and the 4th industrial revolution and abilities to respond to social changes.

There has been continuous research and surveys for the development of general education in universities as general education was emphasized and expanded like this besides major education in universities. There has been continuous research on the satisfaction and outcomes of learners as an internal element and social change as an external element. External and internal factors were collected and reflected into the general education curriculum for its improvement through the continuous performance of such research. Therefore, such research should be regularly and constantly conducted for the development of the general education of universities. Even though the four-year-course universities in the whole nation are performing the survey on the actual status of whole general education areas, it is still insufficient yet. However, each university is designing general education curriculum through the survey on the actual status and satisfaction. The future society is not the era of simple majors or general education but the era of convergence which is gradually expanding to convergence majors. Moreover, the current society is asking for logical thinking for solving social problems and abilities to present solutions, so it is asked to provide high-dimensional thinking and education one-step higher than the existing education (Kim, 2022). Thus, the general education of a university should focus on not only the good function of academic achievement but also education based on various learning experiences and thinking. This study aims to survey the perception and satisfaction of general education targeting the learners currently enrolled in H University and then to examine the factors affecting the perception and satisfaction of general education and their correlations. Furthermore, this study aims to design the direction and curriculum of general education at H University based on the results of the analysis.

1.2. Research Content
The research content of this study is as follows:
First, how is the current status of general education at H University?
Second, how is the satisfaction with general education at H University?
Third, what are the insufficiencies and improvement measures of the general education curriculum of H University?

1.3. Methods
First, it is the analysis of the theoretical backgrounds of general education. Once a title and research content were drawn, the theoretical backgrounds were analyzed based on them.

Second, it is the survey analysis. A survey on the satisfaction was conducted targeting the enrolled students of H University. The analysis was conducted based on the results of the survey.

Third, this study surveyed learners' demands for new general education courses and other suggestions and then analyzed their needs.

Table 1 presents the research procedure and flow.

Table 1. Research procedure and flow.

Step 1	Design of purpose and content
Step 2	Theoretical backgrounds
Step 3	Survey
Step 4	Survey analysis and deduction
Step 5	Conclusion and discussions

2. THEORETICAL BACKGROUNDS
2.1. General Education Curriculum of the University
The 4th Industrial Revolution era emphasized the importance of not only major education but also social relation and social competency. Thus, universities were expected to play roles in cultivating social relation and social competency, acquiring knowledge about society and developing coping abilities. Universities thought that it would be possible to acquire an ability to introspect human life, to learn new knowledge and to strengthen an ability to adapt oneself to changes through general education (Schwab, 2016). Based on this, the universities in OECD countries tend to be gradually expanding the ratio of general education compared to major education.

Similarly, Europe has brought about significant changes in the credit system and operation of course through the reform of the school system called the "Bologna Process" to secure the competitiveness of university education. Considering European universities with high academic pride and slow changes for hundreds of years, this change is interpreted as their response to education to cope with the changing society and world situation (Kim, 2022).

2.2. General Education in the 4ᵗʰ Industrial Revolution Era

Due to the COVID-19 pandemic, society was quickly changed from face-to-face society to non-face-to-face society and online society. This situation is also applied to university lectures. The class method was unavoidably changed from face-to-face class method to non-face-to-face class method. In addition, the 4ᵗʰ Industrial Revolution announced in 2016 and consequent talent cultivation was socially required. According to social needs, learners' needs and social changes, academic changes are needed, so universities are also changing. The 4ᵗʰ Industrial Revolution and social changes are quickly changing the goals, process and methods of education. Moreover, the 4ᵗʰ Industrial Revolution has brought about changes in competencies and values required in the vocational system and society. As a coping with the future and change, this change is presenting the future direction of general education. Finally, general education should provide not only simple basics but also competencies to pioneer new fields as basic education (Cho, 2017). It would be necessary to advance the curriculum through the diagnosis of core competencies for the 4ᵗʰ Industrial Revolution and the design of integrated curriculum instead of the binary method of general education and major education (Cho, 2017). The 4ᵗʰ Industrial Revolution era asks for not the solution of problems through fragmentary knowledge but the solution of problems through stereoscopic and comprehensive looks. Thus, it is required to have multilateral thinking skills, the so-called "intellectual connecting prospect" that views and connects knowledge of each specialized field under an extensive and deep perspective (Won, Kim, & Oh, 2017). In universities, convergence education started with the execution of the "industrial convergence specialized talent cultivation" project in 2013 which was belated compared to elementary and secondary schools. This convergence education was neither formed spontaneously in universities nor organized in the national curriculum. For this reason, there was no active research on convergence education and both professors and learners did not show high participation and understanding in the field (Jeon, 2022). The core change of the 4ᵗʰ industrial revolution is based on the platform that could cross over barriers between industries and companies (Won et al., 2017). The dictionary definition of "platform" is a space where passengers and means of transportation such as trains, subways and buses meet with each other (Lee et al., 2020). Regarding this platform, the advanced smart platform is the core of the 4ᵗʰ Industrial Revolution era. The smart platform is an advanced platform where various values are exchanged in virtual space by connecting information including physical connection in combination with information and communication technologies. The concept of talent required in the 4ᵗʰ Industrial Revolution era is professional manpower equipped with integrated thinking skills to understand and utilize "platforms" (Won et al., 2017). Finally, what we should aim for and pay attention to is the cultivation of talent according to the core elements and values of the platform. Cultivating talent who can combine and deal with the extensive theme should be taken as the direction of general education.

2.3. Learning Competencies and Learning Outcomes of General Education

According to socio-environmental changes, the OECD (2018) raised the necessity to change general education not to knowledge education but to competency-centered education. It raised the necessity of education by subdividing competencies. The core competencies can be classified into cognitive areas and non-cognitive areas. The cognitive area could include communication skills and high-dimensional thinking skills like problem-solving ability, analytical ability, and critical ability while the non-cognitive area could include emotional aspects such as interpersonal relation and self-management (Choi & Lee, 2009). It would be possible to acquire not only learning ability in major areas but also professional abilities by cultivating creativity, character and citizenship and helping the academic understanding in various fields through general education that harmoniously cultivates the competencies in those two areas (Lee, Kim, & Lee, 2010).

Moreover, the high-dimensional learning makes learners challenge the existing custom and also promotes social interactions (Park, 2004). The high-dimensional learning experience also has positive effects on academic achievement (Zeegers, 2004) and provides a more joyful learning experience than superficial learning (Lee & Bae, 2018; Tagg, 2003). However, there are not many preceding research on high-dimensional thinking as an area of learning outcomes in general education. However, it was insufficient to measure learning competencies as the perception, satisfaction, and learning outcomes of general education, and it was difficult to find research on relations between factors of each general education despite the necessity

of continuous research on learning outcomes based on students' satisfaction with general education and experiences in general education as a basis of feedback for the development and improvement of general education.

3. METHODS

3.1. Survey Subjects

This study conducted a survey on the perception and satisfaction of general education focusing on enrolled students of H University. Table 2 presents the current status of general education courses as follows:

Table 2. Current status of general education courses.

Classification	The number of courses	Credit	Remarks
General education requirements	12	16	Communication Ⅰ~Ⅳ, disaster safety and prism Dd-1
Open electives	137	15 or more	Nothing special
Major credits	65 credits or more		
Graduation credits	130 credits or more		

From December 5, 2022 to January 9, 2023, the survey was conducted targeting the whole enrolled students of six faculties in H University. The survey was conducted online and the total number of respondents was 3,015 people. Table 3 shows the number of survey respondents in each faculty as follows:

Table 3. The number of survey respondents in each faculty.

Classification	Population (N)	The number of respondents (N)	Percentage (%)
Faculty of aeronautics	1,929	1,542	79.9
Faculty of aeronautic convergence	366	336	91.8
Faculty of public health	1,349	642	47.6
Faculty of design and intermedia	537	252	46.9
Faculty of sports science	355	183	51.5
Faculty of convergence general education	144	60	41.7
Total	4,680	3,015	64.4

3.2. Questionnaire

This online survey on the perception and satisfaction of general education was composed of total 50 questions and ten items such as organization and scale of general education, criteria for choosing general education, teaching, learning and assessment methods of general education, professors of general education, overall satisfaction with general education, learning activities of general education, learning outcomes of general education, administrative service of general education, general education support facilities and the 4th industrial basic knowledge of general education. The background factors of students were composed of faculty, major, gender, school year and age. Besides the basic items of respondents, all the responded questions were based on the 5-point Likert scale such as " not at all", "no", "moderate", "yes" , and " very much so" .

3.3. Data Analysis Methods

Statistical Package for the Social Sciences (SPSS) is a statistical package for social science. It is a statistical program that has been developed since 1968. Analysis of Variance (ANOVA) is a hypothesis test using an F distribution created by comparing variance, total mean and variance between groups caused by differences in the mean of each group when comparing two or more groups with each other in statistics.

This study conducted an online survey targeting the whole enrolled students of H University. Each question was analyzed through the frequency, percentage and descriptive statistics. Using SPSS22.0, the one-way ANOVA was conducted. In case,

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there were significant cases between whole groups, the post-test was performed to concretely examine significant relations between groups.

4. RESULTS

4.1. Descriptive Statistics on Each Area of General Education

Table 4 presents the descriptive statistics on enrolled students' satisfaction with general education. According to Table 4, in the descriptive statistics on enrolled students' satisfaction with general education in each factor, the mean was 3.76 out of 5.00. The learning activities of general education showed the highest satisfaction as 4.09 which was followed by choice criteria as 3.98 and the 4th industrial basic knowledge as 3.93 in order. The organization and scale of general education showed the lowest satisfaction as 3.16 and the overall satisfaction with general education, administrative services of general education, and general education support facilities were lower than the mean.

Table 4. Descriptive statistics on enrolled students' satisfaction with general education.

Factor	Mean	Standard deviation	Overall rankings
Learning activities of general education	4.09	0.701	1
Criteria for choosing general education	3.98	0.647	2
The 4th industrial basic knowledge of general education	3.93	0.775	3
Professors of general education	3.86	0.802	4
Teaching, learning assessment methods of general education	3.83	0.734	5
Learning outcomes of general education	3.80	0.832	6
Overall satisfaction with general education	3.72	0.886	7
Administrative service of general education	3.61	1.019	8
General education support facilities	3.59	0.943	9
Organization and scale of general education	3.16	0.54	10
Mean	3.76	0.79	Not applicable

4.2. Satisfaction with Education According to Gender

Table 5 shows the differences in satisfaction with general education according to gender. According to Table 5, in the results of analyzing differences in enrolled students' satisfaction according to gender, with items like criteria for choosing general education, teaching, learning assessment methods, professors, overall satisfaction, learning activities, learning outcomes, administrative service, and support facilities, the significance probability value was lower than 0.05, and the mean score was more highly shown in women than men which means that women perceived satisfaction statistically significantly higher than men.

Table 5. Differences in satisfaction with general education according to gender.

Factors	Items	Mean	Standard deviation	T	Significance probability
General education organization and scale	1. Male	3.19	0.594	1.556	0.120
	2. Female	3.13	0.493		
General education choice criteria	1. Male	3.85	0.682	-4.800	0.000***
	2. Female	4.05	0.606		
General education teaching and learning assessment methods	1. Male	3.70	0.753	-4.661	0.000***
	2. Female	3.92	0.705		
General education professors	1. Male	3.72	0.831	-4.983	0.000***
	2. Female	3.97	0.762		
General education overall satisfaction	1. Male	3.60	0.886	-3.555	0.000***

Factors	Items	Mean	Standard deviation	T	Significance probability
	2. Female	3.80	0.876		
General education learning activities	1. Male	4.03	0.696	-2.165	0.031*
	2. Female	4.13	0.703		
General education learning outcomes	1. Male	3.69	0.858	-3.852	0.000***
	2. Female	3.89	0.800		
General education administrative service	1. Male	3.52	1.041	-2.404	0.016*
	2. Female	3.68	0.997		
General education support facilities	1. Male	3.47	0.927	-3.638	0.000***
	2. Female	3.68	0.946		
General education demand for the 4th industrial basic knowledge	1. Male	3.95	0.793	0.751	0.453
	2. Female	3.91	0.762		

Note: *:$p<0.05$, ***:$p<0.001$.

4.3. Satisfaction with Education according to School Year

Table 6 presents the differences in satisfaction with general education according to school year. According to Table 6, in the results of conducting the one-way ANOVA for verifying differences in satisfaction with each variable according to school year of enrolled students, the satisfaction with learning activities of general education showed the highest score (4.23 out of 5.00) in the third year. In the post-test, the third-year students showed statistically higher satisfaction than the second-year and fourth-year students. The satisfaction with professors and learning outcomes of general education were more highly shown in the third year than the fourth year. There were no statistically significant differences in organization and scale of general education, teaching, learning assessment methods of general education or demand for the 4th industrial basic knowledge.

Table 6. Differences in satisfaction with general education according to school year.

Factors	Items	Mean	Standard deviation	F	Significance probability
General education organization and scale	1st year	3.14	0.516	1.065	0.370
	2nd year	3.19	0.557		
	3rd year	3.12	0.516		
	4th year	3.18	0.612		
General education choice criteria	1st year	3.92	0.631	2.986	0.030*
	2nd year	3.93	0.656		
	3rd year	4.08	0.616		
	4th year	3.95	0.719		
General education teaching and learning assessment methods	1st year	3.83	0.704	1.521	0.207
	2nd year	3.83	0.742		
	3rd year	3.87	0.772		
	4th year	3.68	0.717		
General education professors	1st year	3.89	0.798	3.666	0.012*
	2nd year	3.87	0.799		
	3rd year	3.92	0.837		
	4th year	3.61	0.707		

Factors	Items	Mean	Standard deviation	F	Significance probability
General education overall satisfaction	1st year	3.73	0.876	3.412	0.017*
	2nd year	3.76	0.874		
	3rd year	3.74	0.931		
	4th year	3.44	0.821		
General education learning activities	1st year	4.10	0.672	4.961	0.002**
	2nd year	4.02	0.724		
	3rd year	4.23	0.654		
	4th year	3.98	0.781		
General education learning outcomes	1st year	3.85	0.821	4.159	0.006**
	2nd year	3.75	0.845		
	3rd year	3.91	0.830		
	4th year	3.59	0.782		
General education administrative service	1st year	3.71	0.964	5.180	0.001**
	2nd year	3.66	0.955		
	3rd year	3.48	1.128		
	4th year	3.32	1.107		
General education support facilities	1st year	3.66	1.107	2.765	0.041*
	2nd year	3.59	0.888		
	3rd year	3.56	0.913		
	4th year	3.35	1.097		
General education demand for the 4th industrial basic knowledge	1st year	3.92	0.777	2.091	0.100
	2nd year	3.86	0.807		
	3rd year	4.02	0.714		
	4th year	3.98	0.770		

Note: *:$p<0.05$, **:$p<0.01$.

4.4. Detailed Satisfaction with General Education

Table 7 shows the enrolled students' satisfaction with general education. According to Table 7, in the rankings of enrolled students' satisfaction with general education according to detailed content, the item "I perform all the tasks that occur in classes" in learning activities of general education showed the highest mean score (4.38 out of 5) followed by the item "I focus my attention during class hours" showing the mean score of 4.17. And the item "Each lecture room of a general education course is fully equipped with multimedia facilities (e.g., beam projector, speaker, computer etc.)" in general education support facilities showed the lowest satisfaction (mean score: 3.46).

Table 7. Enrolled students' satisfaction with general education.

Factors	Items	Mean	Standard deviation	Rankings
Professors of general education	I am overall satisfied with the professors of general education courses at my university.	3.86	0.854	5
	The professors of general education courses at my university have expertise.	3.87	0.865	4
	The professors of general education courses at my university have suitable teaching and learning	3.86	0.852	5

Factors	Items	Mean	Standard deviation	Rankings
	methods for the courses.			
Overall satisfaction with general education	The qualitative level of general education courses at my university is overall satisfactory.	3.73	0.938	14
	The guidance and advice related to bachelor's degrees in general education at my university are satisfactory.	3.7	0.961	15
	I think the general education at my university is systematically composed.	3.68	0.954	17
	I think the general education curriculum at my university is well operated.	3.75	0.91	13
Learning activities of general education	I actively participated in questions or debates during general education.	3.85	0.915	8
	I perform all the tasks that occur in classes.	4.38	0.782	1
	I focus my attention during class hours.	4.17	0.797	2
	I enjoy learning activities of the curriculum.	3.94	0.863	3
Learning outcomes of general education	General education curriculum contributed to knowledge and techniques required for employment.	3.78	0.901	11
	General education curriculum contributed to communication skills (Writing and speaking).	3.81	0.944	9
	General education curriculum contributed to creative problem-solving ability.	3.77	0.929	12
	General education curriculum contributed to the ability to utilize information and technology.	3.79	0.931	10
	General education curriculum contributed to university life and cultivation of character.	3.86	0.932	5
Administrative service of general education	I think that the administrative staff of general education at my university are kind.	3.7	1.044	15
	I think that the administrative staff of general education in my university have active communication (Acceptance of inquiries, requests, suggestions etc.) with students.	3.56	1.081	21
	I think I am overall satisfied with the administrative service of general education at my university.	3.57	1.086	20
General education support facilities	Each lecture room of general education courses is fully equipped with multimedia facilities (e.g., beam projector, speaker, computer etc.).	3.46	1.084	22
	The support for online lectures of general education courses is sufficient.	3.66	1.012	18
	General education curriculum is fully equipped with the online learning support system (e.g., portal).	3.64	1.043	19
Mean		3.79	0.94	Not applicable

4.5. Demand for New General Education Courses
Table 8 presents the demand for new general education courses. This study created, classified and researched major items like progressiveness, coexistence, and inquiry to understand enrolled students' demand for new general education courses. According to Table 8, the area of progressiveness showed the highest (N=473, 47.1%). The area of inquiry was selected by 319 respondents (31.7%) which showed the second-highest demand following the area of progressiveness. The area of coexistence was 21.2%.

Table 8. Demand for new general education courses.

Area	Content	Frequency	Percentage
Progressiveness	Safety, arts, physical education etc.	1419	47.1
Coexistence	Society, culture, language, philosophy etc.	639	21.2
Inquiry	Employment, business start-up, technology, management etc.	957	31.7
Total	-	3,015	100

5. CONCLUSION

This study examined the satisfaction and perception of general education by conducting an online survey targeting the enrolled students of H University. The results of analyzing the survey could be summarized as follows:

First, the sector of general education programs showed high satisfaction while the administrative sector showed a bit low satisfaction in the results of analyzing the major items of general education. The students' learning activities (4.09), choice of course (3.96), and the 4th future industry (3.93) showed high positive responses. However, the administrative service (3.61), support facilities (3.59), and organization and scale (3.16) showed low positive responses, so the administrative service and facilities should be improved.

Second, in the results of analyzing detailed items of general education, the learning activities and professors of general education showed the highest satisfaction. However, the qualitative level of general education courses, guidance and advice in general education support facilities showed the lowest satisfaction. It would be necessary to accompany detailed explanation and workshop, and also to put efforts into the improvement of facilities to raise the students' satisfaction and level of understanding.

Third, it is demand for new general education courses. The new general education courses were classified into areas of progressiveness, coexistence, and inquiry. The area of progressiveness (47.1%) showed the highest demand which was followed by the area of inquiry (317%) and the area of coexistence (21.2%) in order. In demand for general education in the area of progressiveness, safety, arts, physical education, and practical general education showed high demand. Concretely, the ski-related exercise and emergency rescue-related courses like emergency response and CPR showed high demand. In demand for general education in the area of inquiry (31.7%), employment, start-up the economy showed the highest demand. Concretely, the demand for management, economy, technology and mock start-ups and career exploration was high. Demand for general education in the areas of coexistence (21.2%), society, culture, language, and history showed the highest demand while demand for society and interpersonal relationships, language and philosophy, and teamwork was high.

This study understood the perception of general education targeting the enrolled students of H University. However, the research participants were limited to the enrolled students of H University, so it is limited to generalize the results of this study to every university. Furthermore, each university should conduct a regular survey on perception to understand social changes and enrolled students' needs of general education. Based on the survey results of perception, it would be necessary to improve insufficiencies and also to operate the feedback general education curriculum model by reflecting the survey results into the future curriculum.

INSTITUTIONAL REVIEW BOARD STATEMENT
The Ethical Committee of the Jeonbuk Science University, South Korea has granted approval for this study (Ref. No. 2024-0903).

TRANSPARENCY
The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

COMPETING INTERESTS
The author declares that there are no conflicts of interests regarding the publication of this paper.

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