

A Study on the Improvement and Revitalization of General Center for Convergence Research Services based on the Integrated Research Center's Recognition Survey

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ABSTRACT

In this study, the Commission sought to investigate the progress and value changes of convergence researchers participating in the Interdisciplinary Research Support Project of the Korea Research Foundation along with the participation and satisfaction of HubCon regularly held at the Center for Convergence Research based on the researchers' request to promote the improvement direction of services at the Center for Convergence Research in the future and the development of the humanities-based Convergence Research. Briefly summarizing the results of the study is as follows. First, overall satisfaction with HubCon was lower in 2019 than in 2018, indicating the need to redefine the overall meaning and direction of each event held at the Convergence Research Center and set up a window to reflect the opinions of convergence researchers in the process of preparing the event. Second, it is analyzed that the time has come for the reorganization of the support services of the Convergence Research Center based on the needs and demands of the convergence researchers. Third, as the convergence research center has been frequently changed to various research institutes, it needs a stable player who can continuously supplement new services on top of regularized services. Fourth, it is required to provide differentiated support according to the timing of the research by convergence researchers and the problem of occurrence. Fifth, convergence research can create new convergence value by supporting it. Sixth, it is affecting the perception of convergence researchers involved in convergence research. As a center that supports convergence research projects, we should consider what convergence researchers call a "network" really means.

1. Introduction

As the interest in convergence research has increased, domestic and international researchers have attempted various approaches by destructing the boundaries of cooperation limited to a single

field and converging academy and technology, academy and academy as well as technology and technology which has been changing the paradigm of industry and academy by acting as a driving force for the growth.

From the narrow scope of convergence solely referring to the combination of early science and technology, the application scope of convergence research has been broadened, including the convergence of humanities and arts. As an example of expanding comprehensive convergence areas including humanities and arts as a basis of technology science, the United States secured NBIC convergence technology strategy which combines nanotechnology (NT), biotechnology (BT), information technology (IT) and cognitive science (CS) in order to improve human performance capability and various convergence technology development programs have been promoted from various angles centering on government agencies (NSF & DOC, 2002). In addition, the European Community has made the agenda of “Converging Technologies for the European Knowledge Society (CTEKS)”, which suggests a more comprehensive range of convergence technologies and a direction of the convergence field, including humanities and social sciences in addition to the NBIC of the US (EC, 2004).

As such, in order to solve the problems of society, which becomes gradually more complex, convergence research that can creatively apply the perspectives and research methods from various academic fields is required. In addition, securing measures to seek innovative solutions while pursuing potential possibilities and value creation through convergence research based on the humanities exploring human beings and human life has been continuously demanded.

To this end, the National Research Foundation of Korea has been supporting humanities-based convergence research through interdisciplinary Convergent Research Project since 2009. It has also built a new business of General Center for Convergence Research in 2011, identifying the needs to systemically provide supports for Convergence Research Institute. In particular, it has been aiming to define a clear definition of convergence research, expand the base of convergence researchers, and facilitate networks among the research teams.

General Center for Convergence Research which serves a bridging role between the National Research Foundation of Korea’s Cultural Convergence and Integration Team and Interdisciplinary Convergent Research Project Team, performs the role as a communication hub between convergence studies encompassing humanities and social science as well as arts and science in the age where the importance of convergence research is on rise.

Through serving the bridging role between industries, researchers and information, after collecting the requirements for General Center for Convergence Research services by conducting surveys on the opinions of researchers in order to enable the convergence researchers to deduce the best results, it should actively reflect them in the direction of service improvement.

For this purpose, this study investigated the level of satisfaction for HubCon, which is regularly held by General Center for Convergence Research, as well as the current status and value changes of convergence researchers. Simultaneously this study sought the measures to vitalize humanities-based convergence research in line with the requirements made by the researchers, while improving the service of General Center for Convergence Research.

2. Theoretical Background

2.1 General Center for Convergence Research

As a part of the National Research Foundation of Korea's 'Interdisciplinary Convergent Research Project', the General Center for Convergence Research was launched in 2011 for the continuous management of convergence research, with the purpose of expanding the base of convergence research, spreading the results of convergence research and setting new agendas for the Interdisciplinary Convergence Research Team. For this purpose, it has been acting as an institute supporting convergence research teams through holding seminars, forums and visiting colloquium events, making every effort to activate communication among convergence research teams and convergence studies. Since 2017, it has also been operating the General Center for Convergence Research at Konkuk University Knowledge Contents Institute.

In detail, the General Center for Convergence Research seeks to create communication opportunities for interdisciplinary research achievements and methods in various ways to promote convergence research based on humanities and societies. For the efficient promotion of interdisciplinary convergence research, the National Research Foundation of Korea organizes forums and holds advisory meetings on research projects for the researchers of the Interdisciplinary Convergence Research Project, promoting the achievements and news of the convergence research for inside and outside of the expert area. In addition, to promote the convergence research in the fields of science, technology, and humanities, it operates the homepage for General Center for Convergence Research, where researchers can exchange with each other and information on achievement for each project and seminars can be found. The General Center for Convergence Research shares the know-hows of research achievements by interacting with convergence research experts and spreading convergence research through the media, and develops new agendas to mature existing convergence research, expecting to lower the entrance barrier for new convergence research.

2.2 Strategies and Tasks of General Center for Convergence Research

General Center for Convergence Research operates the business by broadly establishing the four strategies of spreading culture, expanding support, sharing achievement and expanding network and establishing tasks to achieve each of the strategies in order to promote the convergence research.

In addition, General Center for Convergence Research issues the Journal of Transdisciplinary Studies (JTS, Convergence Research Journal) twice a year to globally promote the convergence research of domestic researchers.

Table 1. Strategies and Tasks of General Center for Convergence Research

Strategy	Task	
① Spreading Culture of Convergence Research	1	◦ Take measures to activate the homepage of General Center for Convergence Research
	2	◦ Collect Convergence Research Big Data and Introduce Provision Service
	3	◦ Issue Trend Analysis Report on Domestic and Overseas Convergence Research
	4	◦ Issue and Publish Convergence Research Methodology
② Expanding Support for Convergence Research	1	◦ Categorize Humanities-Based Convergence Research Type
	2	◦ Activate Convergence Co-Research (Expand the Number of Supporting Research)
	3	◦ Improving the Efficiency and Effectiveness of Visiting Colloquium
	4	◦ Share Government RND Business for Convergence Researchers
	5	◦ Conduct Satisfaction Survey on Researchers for Hubcon and Achievement Exchange Meeting
③ sharing achievement	1	◦ Publish Convergence Research Performance Presentations and Records
	2	◦ Collect and Provide Success Cases of Domestic and Overseas Convergence Research
	3	◦ Vitalize Convergence Research Forums
④ Expanding Network	1	◦ Provide Various Exchange Opportunities for Convergence Research
	2	◦ Sign MOU with Societies and Institutions and activate exchange with contracted organizations
	3	◦ Strengthen Networks for Related Academic Researchers and Groups
	4	◦ Secure Promotion Measures for General Center for Convergence Research and Convergence Research

2.3 Related Previous Studies

It was found that not many studies have been conducted on the aspect of level of satisfaction of humanities-based convergence researchers who are participating in the Interdisciplinary Convergence Research Project. Kim and Lee (2018) surveyed the experience and level of satisfaction of the research teams participating in the Interdisciplinary Convergent Research Project. The responses showed expansion of network and improved understanding of other majors as the positive experiences for convergence research whereas lack of knowledge about other major fields and the pressure on achievements were identified to be negative experiences of convergence research. Also, the researchers were highly satisfied with the process and results of convergence research, showing a high willingness to retry or continue and recommend convergence research to others.

As for the previous studies conducted by General Center for Convergence Research on humanities-based convergence research or related to Interdisciplinary Convergent Research Project are Study on Achievement Analysis (Noh & Jeong, 2018), Study on Influential Factors on Humanities-Based Convergence Research (Noh, Lee, & Jeong, 2018) and Social Big Data Convergence Research Trend Analysis (Noh, Kim, & Jeong, 2019) which are used to external promotion. Also, continuous effort has been made to improve offered services by analyzing trends for convergence research and conducting surveys on the researchers participating in the Interdisciplinary Convergent

Research Project.

For studies on the Interdisciplinary Convergent Research Project conducted from other aspects, Study on the Characteristics of Convergence Researchers Participating in the Interdisciplinary Convergence Research Project the Their Team Composition (Kim, Park, & Jo, 2017), Study on the Structure of Humanities-Based Convergence Research Utilizing Network Analysis (Yang & Huh, 2017) and Proposal of Successful Convergence Research Method for Interdisciplinary Convergence Researchers to Overcome Trial and Error (Kim, Kim, & Lee, 2018) were identified. It was found that the studies have been mainly conducted from methodology aspect to understand how the humanities-based research is carried out.

Han et al. (2009) examined from the standpoint of the conditions and research capacity of convergence research, research infrastructure of universities, research network, the spreading and utilization of research results, and issues and the results indicated that the foundation of convergence research must be by increasing investment for convergence research, accepting faithful failures for high-risk/high-profit research, establishing networks and communication channels between each discipline, and enhancing openness of researchers.

This study evaluated the level of satisfaction for services provided by General Center for Convergence Research, including HubCon Conference, and quantified the current status of convergence research and value changes of convergence researchers from the standpoint of convergence researchers who are the subjects of the services and actual members conducting convergence research, simultaneously pursuing to actively reflect in the improvement direction of the Center.

3. Methods

3.1 Data Collection

In this study, the progress status of convergence research status and level of satisfaction of the researchers participating in the Interdisciplinary Convergent Research Project for the services provided by General Center for Convergence Research was investigated using Likert 5-Scale in order to improve the services provided by General Center for Convergence Research and find measures to vitalize humanities-based convergence research.

This study was carried out during the '2019 HubCon Conference' held from April 26 to 27, 2019 to distribute and collect questionnaires. The survey target selected from the 24 convergence research teams who were chosen for convergence research support business sponsored by the National Research Foundation of Korea, was the 19 teams, composed of 71 convergence researchers, who participated in the HubCon Conference. The questionnaires were distributed directly to 63 researchers, excluding 8 participants from the Konkuk University General Center for Convergence Research to secure the objectivity among the 71 participants attended the HubCon Conference and a total of 32 questionnaires were collected. Data collected through the survey were processed by Statistical Package for the Social Sciences (SPSS) 23.0 for Windows to apply descriptive statistics in order to obtain the opinions of convergence researchers.

In addition, in order to understand the changes in perception and level of satisfaction among the convergence researches, a comparison/analysis was made between the 2019 HubCon Conference and 2018 HubCon Conference held between May. 31, 2018 and Jun. 1, 2018. The 2018 survey was conducted on 68 participants of the convergence research seminar and analyzed based on the data from 52 respondents.

The questionnaire consisted of five questions on the general user, seven questions on the overall HubCon Conference, seven questions on satisfaction with the General Center for Convergence Research, nine questions on the overall convergence research for each researcher, and 14 questions on the changes in the value of the convergence researchers. Below Table 2 summarizes the contents and composition of questions of the questionnaire.

Table 2. Contents and Composition of Questions of the Questionnaire

Category	Method	2018	2019
Personal Information	Gender / Age / Location of Organization / Role in Participating Convergence Research / Major (Minor)	✓	✓
4.1 Investigation on Overall HubCon Conference	Experience in Participating HubCon Conference	✓	✓
	Level of Satisfaction for Overall HubCon Conference	✓	✓
	Level of Satisfaction for HubCon Conference Location and Time	✓	✓
	Level of Satisfaction for HubCon Conference Accommodation and Facility	✓	✓
	Level of Satisfaction for HubCon Conference Lecture	✓	✓
	Level of Satisfaction for HubCon Conference Round Table Discussion	✓	✓
	Difficulties (Problems) in HubCon Conference Preparation	✓	✓
4.2 Investigation on the Rule of General Center for Convergence Research	Overall Perception of General Center for Convergence Research	✓	✓
	Desired Supportive Role of General Center for Convergence Research (Multiple Response)	✓	✓
	Experience of Using the Homepage of General Center for Convergence Research	✓	✓
	Experience of Using General Center for Convergence Research Services (Multiple Response)	✓	✓
	Experience of Receiving Help from the Information Found from the General Center for Convergence Research Homepage	✓	✓
	Helpfulness of the Information from General Center for Convergence Research Homepage	✓	✓
	Willingness to Sign-up and use the General Center for Convergence Research Website	✓	✓
4.3 Investigation on the Perception of each Researcher Toward Overall Convergence Research	Ongoing Convergence Research by Research Team	✓	✓
	Difficulties in Conducting Convergence Research (Multiple Response)	✓	✓
	Conflict Factors Among Team Members (Multiple Response)	✓	✓
	Resolve Measures for Conflicts among Team Members	✓	✓
	Great Advantages Receiving from Interdisciplinary Convergence Research Support Business (Multiple Response)	✓	✓
	Appropriate Number of People for Convergence Research	✓	✓
	Suitable Number of Interdisciplinary Majors to Effectively Carry Out Convergence Research	✓	✓
	Ratio of researchers in humanities (humanities, social studies, arts and physical education) and science (engineering, medicine and natural sciences)	✓	✓
	Level of Satisfaction for Convergence Research	✓	✓

Category	Method	2018	2019
4.4 Value Changes of Convergence Researchers	Region of Obtaining the Highest Education		√
	Level of Research Experience		√
	Voluntary Start		√
	First Time Starting Convergence Research		√
	Route to Learn about Convergence Research		√
	Times When Wanting to Stop Convergence Research		√
	Reasons Why Wanting to Stop Convergence Research		√
	Time When Determination to Continue Convergence Research was Made		√
	Ultimate Goal of Continuing Convergence Research		√
	Serving a Bridging Role with Other Majors After Starting Convergence Research		√
	Experience of Recommending Convergence Research		√
	When Forming a Convergence Research Team is Difficult		√
	Reason for Liaising for Graduate Students and Non-Professional Doctoral Degree Holders		√
	Securing Position as Mainstream Academic Field		√
Total		23	37

3.2 Research Question

This study sought to identify the service improvement direction for the services provided by General Center for Convergence Research by reflecting the opinions of convergence researchers, resulting in making contribution to the promotion of humanities-based convergence. For this purpose, change in the level of satisfaction for HubCon, which is regularly held by General Center for Convergence Research, for the year of 2018 and 2019, overall level of satisfaction for the services provided by General Center for Convergence Research and the value changes of convergence researchers were investigated. Questions asked for the matters are as follows:

- RQ 1: What changes have been made to the level of satisfaction among the convergence researchers for HubCon regularly held by General Center for Convergence Research since 2018?
- RQ 2: How satisfied are the convergence researchers with the services provided by General Center for Convergence Research?
- RQ 3: What can the Center do in order to vitalized humanities-based convergence research?

4. Results

4.1 Investigation on the level of satisfaction for HubCon Conference

For this area, experience of HubCon conference participation, overall progress, place and time, accommodation and facility, lecture, and the level of satisfaction for round table discussion and difficulties in preparing for the conference were investigated.

4.1.1 Experience in Participating HubCon Conference

As a result of investigation conducted to find out the previous experiences of participating in HubCon Conference, 32.69% and 40.63% of the respondents in 2018 and 2019, respectively, indicated that they have a previous experience of attending the conference, showing an increase in the number of respondents with previous experience compared to the year before. In addition, as 60% of the HubCon participants in 2019 were new enterprise organizations and the number of enterprise organizations participating in the Interdisciplinary Convergent Research Project at the time of conference was 28 in 2018 and 24 in 2019, it can be interpreted as the participation of new enterprise organizations have been activated.

Table 3. Previous Experience of Participating HubCon Conference

Division	2018		2019	
	N	%	N	%
Yes	17	32.69	13	40.63
No	35	67.31	19	59.38
Total	52	100.00	32	100.00

4.1.2 Level of Satisfaction for Overall Progress

The result from investigation on the level of satisfaction for the overall progress of HubCon Conference revealed that the level of satisfaction was 92.31% in 2018 and 84.38% in 2019, showing a decrease in the level of satisfaction from last year.

Such a decrease in the level of satisfaction

Considering the transmission of noise from other tables during the round table discussion in 2018 HubCon, because it was held at a single large hall, spaces for lecture, round table discussion and food were all separated in 2019 HubCon. Though, such separation of spaces helped making communication under a smooth and calming atmosphere, the decrease in the level of satisfaction can be interpreted as rough progress as the participants had to move to different spaces.

Table 4. Level of Satisfaction for the Overall Progress of HubCon

Division	2018		2019	
	N	%	N	%
Highly Satisfied	10	19.23	7	21.88
Satisfied	38	73.08	20	62.50
Neutral	3	5.77	4	12.50
Not Sure	0	0.00	1	3.13
Unsatisfied	1	1.92	0	0.00
Total	52	100.00	32	100.00

4.1.3 Satisfaction Level for Location and Time

The investigation on the satisfaction level for the location and time of 2018 HubCon Conference revealed that 80.77% of the respondents were satisfied whereas 11.54 responded as they were unsatisfied. The reason for the dissatisfaction was that the conference took place at 'Jeju Island' and took the participants a lot of travel time, and complicated schedule on weekdays. In 2019, 78.13% were satisfied, indicating that satisfaction with location and time was somewhat lower than last year. Though not too big drop in the level of satisfaction, it was found that detailed and precise notice of the location and time of the event is required to be provided to co-researchers, including the lead researchers as well as research assistants at least one month before the event.

It is necessary to encourage the participation of researchers through periodical announcements. In addition, as some suggested that discussion in advance to select a place would be ideal, it seems to be necessary to collect opinions of the project team when selecting the place and time in the future.

Table 5. Level of Satisfaction for HubCon Conference Location and Time

Division	2018		2019	
	N	%	N	%
Highly Satisfied	11	21.15	7	21.88
Satisfied	31	59.62	17	53.13
Neutral	4	7.69	7	21.88
Not Sure	0	0.00	1	3.13
Unsatisfied	6	11.54	0	0.00
Total	52	100.00	32	100.00

4.1.4 Satisfaction Level for Accommodation and Facility.

As a result of surveying the satisfaction level for the accommodation and facility of HubCon Conference, 94.23% in 2018 and 78.13% in 2019 were satisfied, showing a significant decrease in the 2019 satisfaction compared to 2018.

There can be various reasons of dissatisfaction. However, as 'Cost', 'Factors Related to Room Assignment', 'Provision of Clear Notice' and 'Need of Prior Discussion for Location Selection' were observed as some of the influential factors, General Center for Convergence Research need to give convenience of researchers the highest priority.

Especially, accommodation should be an unobligated option for the researchers to decide base on personal needs, unless it seems to be necessary for the Center to arrange for the next day schedules.

Table 6. Satisfaction Level for Accommodation and Facility of HubCon

Division	2018		2019	
	N	%	N	%
Highly Satisfied	28	53.85	10	31.25
Satisfied	21	40.38	15	46.88
Neutral	2	3.85	5	15.63
Not Sure	0	0.00	1	3.13
Unsatisfied	1	1.92	1	3.13
Total	52	100.00	32	100.00

4.1.5 Satisfaction Level for Lecture

As a result of surveying the satisfaction level for lectures at HubCon Conference, 82.70% in 2018 and 84.38% in 2019 were satisfied, showing a slight increase in the 2019 satisfaction compared to 2018. The reason of the increased satisfaction with lecture seems to be that the lectures provided to the convergence researchers were helpful for their actual research as the lectures were carried out based on the contents of the book ‘Convergence Research Methodology’ published by the Convergence Research Teams and General Center for Convergence Research, creating opportunities to share the know-hows of the actual convergence researchers.

Table 7. Satisfaction Level for Lecture at HubCon

Division	2018		2019	
	N	%	N	%
Highly Satisfied	12	23.08	9	28.13
Satisfied	31	59.62	18	56.25
Neutral	7	13.46	4	12.50
Not Sure	1	1.92	1	3.13
Unsatisfied	1	1.92	0	0.00
Total	52	100.00	32	100.00

4.1.6 Satisfaction Level for Round Table Discussion.

As a result of surveying the satisfaction level for each round table discussion at HubCon Conference, 82.70% in 2018 and 78.13% in 2019 were satisfied, showing a decrease in the 2019 satisfaction compared to 2018. As the reason for decrease in the satisfaction with round table discussion, composition of members at each table were similar to that of the past year, hindering fresh and creative ideas, was found. This means that though there is a need to maintain grouping for each topic of convergence research teams from the aspects of uniformity and continuity, round table should be planned from various aspects, such as research areas and methodologies, in order to diversify researchers’ networks

and deduce fresh ideas.

Table 8. Satisfaction Level for Round Table Discussion at HubCon

Division	2018		2019	
	N	%	N	%
Highly Satisfied	18	34.62	9	28.13
Satisfied	25	48.08	16	50.00
Neutral	6	11.54	5	15.63
Not Sure	2	3.85	2	6.25
Unsatisfied	1	1.92	0	0.00
Total	52	100.00	32	100.00

4.1.7 Difficulties in Preparation

The result of investigation on the difficulties in preparing for HubCon Conference showed that 67.31% found no typical difficulties whereas 11.54% of the respondents responded that they had difficulties in preparing for the Conference. For the reasons of difficulties in preparation, not much information to present for the nurturing type businesses, difficulties in participating in conference during weekdays, difficulties in attending to the event held at Jeju Island for many researchers and insufficient guidance for the preparation requirements were found. In 2019, 87.50% of the respondents responded that there were no difficulty in preparation, indicating that the convenience of researchers was improved in terms of preparation for the event compared with last year and signifying that the preparation for the conference became easier for the nurturing-type convergence research teams who attended in the 2018 HubCon Conference.

Table 9. Difficulties (Problems) in Preparation for HubCon Conference

Division	2018		2019	
	N	%	N	%
There were no typical difficulties	35	67.31	28	87.50
Not sure	11	21.15	2	6.25
Preparation was difficult	6	11.54	2	6.25
Total	52	100.00	32	100.00

4.2 Investigation on the Level of Satisfaction for the Role of General Center for Convergence Research

In this part the overall perception of General Center for Convergence Research, desired support roles of the Center as well as experience of using the website, usefulness of information found on the website and willingness to sign up were investigated and analyzed.

4.2.1 Overall Perception Toward General Center for Convergence Research

As a result of investigation on the level of satisfaction and helpfulness of the role of General Center for Convergence Research, all 3 items showed scored of 5 or higher, indicating that the respondents generally are satisfied and the events hold by General Center for Convergence Research are helpful for Convergence Research. Particularly, observing the fact that the level of satisfaction for the role and helpfulness of events held slightly increased compared to last year, it can be interpreted as the events and services provided by the General Center for Convergence Research have been stabilizing and the stabilization can help convergence researchers. However, the level of helpfulness the convergence researchers found for convergence research itself was to be not increased, related improvement should be made. Increasing the number of publications of convergence research trends analysis, strengthening colloquium and others can be suggested as the corrective measurement.

Table 10. Overall Perception Toward General Center for Convergence Research

Division	2018		2019	
	M	Std	M	Std
Satisfied with the role of General Center for Convergence Research	5.65	1.118	5.88	0.976
The role of General Center for Convergence Research has provided help in your convergence research	5.56	1.243	5.56	1.190
The events held by General Center for Convergence Research have provided help in your convergence research	5.54	1.196	5.72	1.143

4.2.2 Desired Supportive Roles of General Center for Convergence Research for Convergence Research

The result from the investigation on the desired supportive roles of General Center for Convergence Research for convergence research showed that strengthening the networks among convergence researchers as the most desired role of the Center. As for other responses, providing communication opportunities for difficulties and know-hows of convergence research was 34.62% followed by 28.85% with the response of holding seminars for sharing research achievement in 2018 whereas holding colloquiums supporting convergence research was 21.88% followed by 15.63% of response of promoting convergence research in 2019, showing differences between the two years. This can be understood as the request for colloquiums and active promotional activities by General Center for Convergence Research as conferences and achievement presentations were held to enable sharing of difficulties and know-hows after the 2018 Hubcom Conference. In particular, it was found that the teams, who participate in the Interdisciplinary Convergence Research, excluding newly joined teams, request to make their convergence research promoted and spread and have in-depth discussion for their research fields through colloquiums with external experts, rather than building networks within the business or sharing research achievement. This is indicative of the need to diversify the operational

direction of General Center for Convergence Research to include everyone who is interested in convergence science, such as external experts and the general public, along with internal networking for Interdisciplinary Convergence Research teams.

Table 11. Desired Supportive Roles of General Center for Convergence Research (Multiple Response)

Division	2018		2019	
	N	%	N	%
Promoting Convergence Research	9	17.31	5	15.63
Holding Seminars to Share Research Achievement	15	28.85	4	12.50
Holding colloquiums to Support Convergence Research	6	11.54	7	21.88
Holding Conferences Strengthening Network Among Convergence Researchers	19	36.54	17	53.13
Creating Communication Opportunities to Share Difficulties and Know-Hows of Convergence Research	18	34.62	3	9.38
Others	4	7.69	1	3.13

4.2.3 Experience in Using the General Center for Convergence Research Homepage and Used Items

The result of the investigation on the experience of using General Center for Convergence Research Homepage showed that 82.69% and 87.50% in 2018 and 2019, respectively, have experience in using the homepage, showing an increase compared to the last year. Along with this, the items used from the website was investigated to be in the order of convergence research news, convergence INFO, journal/paper submission both in 2018 and 2019. Especially, the use of ‘Convergence Research News’ was increased from 71.15% in 2018 to 81.25% in 2019, indicating that the updates on conferences, seminars and forum are actively being provided by the website. In addition, it showed that convergence research DB and convergence research achievements, along with the information on recent convergence research projects and researchers’ networks provided by “Convergence INFO” has made researchers to have greater interests in the data provided by General Center for Convergence Research and visit the website more frequently, indicative of the needs to develop new contents and continuously update existing contents.

Table 12. Experience in Using the General Center for Convergence Research Homepage and Used Items

Division		2018		2019	
		N	%	N	%
Have Experience	Yes	43	82.69	28	87.50
	No	9	17.31	4	12.50
	Total	52	100.00	32	100.00
Used Item (Multiple Response)	Journal / Paper Submission	14	26.92	5	15.63
	Convergence Research News – Conference, Seminar, Forum	37	71.15	26	81.25
	Convergence INFO – Convergence-Related DB, Convergence Research Projects, Convergence Research Achievement	17	32.69	8	25.00
	Convergence TALK – Message Board, Gallery	5	9.62	2	6.25
	Apply for Colloquium	4	7.69	3	9.38
	Have Never Used	9	17.31	4	12.50
	Others	1	1.92	1	3.13

4.2.4 Experience in Receiving Help from General Center for Convergence Research Homepage and Willingness to Sign up in the Future

The investigation result showed that only 38.17% found the data provided from the General Center for Convergence Research Homepage helpful in 2018 whereas 62.50% responded that they received help from the Homepage, indicating that the data provided by the website contain became to have more abundant information. The helpful information the respondents found were in the order of research topics, research process, research information such as research achievement, symposium related to convergence research, notice of conference schedule and media promotion for convergence research. As the items are the same as the items users use from the Homepage, what General Center for Convergence Research should fortify in the future can be understood as ‘providing various domestic and international information on convergence research’ for the researchers. In addition, as a result of investigating on the helpfulness of the data available on the General Center for Convergence Research Homepage for conducting convergence research, it was found that 74.42% and 75.00% of the respondents found the data helpful in 2018 and 2019, respectively which indicates that the number of researchers who actually use the data provided by the General Center for Convergence Research is increasing and the researchers simultaneously found the amount and quality of the information provided by the Center meaningful. As a result of investigating whether the respondents intend to sign up to use the homepage of the General Center for Convergence Research in the future, 89.36% in 2018 and 87.50% in 2019 showed their willingness to do so. On the other hand, many responded that they find no reasons to sign up or they don’t feel it’s necessary as the reason of not signing up.

Table 13. Experience in Receiving Help from General Center for Convergence Research Homepage and Willingness to Sign up in the Future

Division	2018		2019		
	N	%	N	%	
Experience in Finding the Homepage Data Useful	Yes	17	36.17	20	62.50
	No	30	63.83	12	37.50
	Total	47*	100.00	32	100.00
Usefulness of Homepage Data	Yes	32	74.42	24	75.00
	No	11	25.58	8	25.00
	Total	43**	100.00	32	100.00
Willingness to Sign up for the Homepage in the Future	Yes	42	89.36	28	87.50
	No	5	10.64	4	12.50
	Total	47***	100.00	32	100.00

* Non-response: 5 Respondents, ** Non-response: 9 Respondents, *** Non-response: 5 Respondents

4.3 Investigation on Perception of Individual Researcher Toward Overall Convergence Research

In this area the convergence research that the research team is conducting, difficulties in conducting convergence research, the conflict factors among members, the measures taken to coordinate at the time of conflicts and the appropriate number of team members/ majors for convergence research were investigated and analyzed.

4.3.1 Ongoing Convergence Research by the Research Team

Ongoing convergence research by the research team was investigated in terms of interestingness of topic, unified goals and direction of convergence research, cohesion, communication, role sharing, practical outcomes, and social contribution. And the result showed that the respondents have a positive and hopeful attitude toward the progress and value of their convergence research. In particular, there found a strong perception of recognizing a social contribution made from convergence research in both 2018 and 2019.

Table 14. Ongoing Convergence Research by the Research Team

Division	2018		2019	
	M	Std	M	Std
The topic of ongoing convergence research is interesting	6.48	0.671	6.16	0.920
All researchers have agreed on the goal and direction of the convergence research	6.40	0.721	6.31	0.780
Convergence research team members have a high level of cohesion	6.10	0.934	6.00	1.164
Convergence research team actively communicate on and off lines	6.12	0.943	5.75	1.164
Role sharing is smoothly made while conducting convergence research.	6.10	0.913	5.91	1.146
The ongoing convergence research by our team has something to make social contribution	6.60	0.846	6.53	0.621
The ongoing convergence research by our team makes actual outcomes	6.50	0.828	6.19	0.821

4.3.2 Difficulties in Conducting Convergence Research

The result of investigating on the difficulties in conducting convergence research identified ‘lack of uniformity in terms of use due to different academic backgrounds’ and ‘pressure on results’ as the general difficulties. Comparing 2018 and 2019, the biggest difficulty found was ‘lack of understanding of other majors’ in 2018 (38.46%) whereas the difficulty in ‘meeting (communication) due to physical distance between team members’ was identified to be more difficult in 2019 compared to 2018.

In addition, other difficulties identified were the complexity of budget execution process, difficulties in selecting and agreeing on meeting place, failures in coordinating opinions among researchers, and difficulties in using budgets efficiently as budget cannot be changed.

Table 15. Difficulties in Conducting Convergence Research (Multiple Response)

Division	2018 (2 Choices)		2019 (Multiple Response)	
	N	%	N	%
Difficulty of meeting (communication) due to physical distance between team members	13	25.00	9	28.13
Unexpected additional costs	14	26.92	6	18.75
Lack of uniformity in terms of use due to different academic background knowledge	17	32.69	9	28.13
Pressures on output	17	32.69	9	28.13
Lack of understanding about other majors	20	38.46	8	25.00
Others	8	15.38	1	3.13

In order to solve the common problems of communication and different majors of the researchers, General Center for Convergence Research holds HubCon and symposium in first and second half of the year, while carrying out other various seminars and workshops.

However, as the difficulties encountered due to physical distance were also high, it is important to investigate how to resolve the problems with the differences between different majors and communication issues due to physical distance and what is the most desired type to solve such problems in order to create the network opportunities that the convergence researchers are sincerely looking forward to have.

4.3.3 Conflict Factors Among Team Members

As a result of investigating the conflict factors among team members, the lack of understanding about other major fields was the found to be biggest conflict factor (38.46% in 2018, 46.88% in 2019) and the amount of co-research experience and different level of contribution when each field is reflected on an outcome were also found to be some of the other conflict factors. In particular, as for the conflict factors showing difference between 2018 and 2019, the attitude of giving higher priority to other tasks than convergence research showed a big difference of 25.00% in 2018 and 9.38% in 2019 and not keeping with the research deadline showed a higher percentage of 12.5%, compared to the last year. Co-researchers lacking the willingness to actively participate and misunderstandings related to budget execution were also found to be other conflict factors.

Such conflict factors can be solved through the communication among the researcher forming each convergence research team and leadership of lead researchers. I

General Center for Convergence Research can provide the opportunities for the researchers to unite in a short to medium term by selecting the best team and poster for research teams that have achieved outstanding results during the annual achievement presentation.

Table 16. Conflict Factors Among Team Members (Multiple Response)

Division	2018		2019	
	N	%	N	%
Not keeping with the research deadlines	5	9.62	4	12.50
Prioritizing other tasks higher than convergence research	13	25.00	3	9.38
Lack of understanding about other majors	20	38.46	15	46.88
When each field is reflected in an outcome, complaints from different level of contribution	9	17.31	4	12.50
Leadership of lead researchers	1	1.92	0	0.00
Establishment or unification of research terms used in convergence research	8	15.38	3	9.38
Amount of experience in co-research	11	21.15	7	21.88
Others	8	15.38	4	12.50

4.3.4 Measures Taken to Coordinate Conflicts Among Team Members

The investigation on the measures taken to coordinate conflict among team members of convergence research team showed that they, most often, have meals or drinks together publicize the problem in order to solve the conflicts. Though it's important to encourage vitalizing networks among different convergence research teams, it is also necessary to provide some free time for each team to communicate to their own team members.

In order words, the events held by General Center for Convergence Research should be able to create opportunities to solve the 'difficulties in (meeting) communication due to physical distance between team members' that each convergence research team has expressed, on top of the opportunity to share and spread the achievement.

Table 17. Measures Taken to Coordinate Conflicts Among Team Members

Division	2018 (Multiple)		2019 (Single)	
	N	%	N	%
By mediator	5	9.62	1	3.13
Have meals or drinks together	15	28.85	6	18.75
Solve the problem by publicizing it	14	26.92	11	34.38
Restructure rules within an organization	5	9.62	4	12.50
Appropriate apology and reconciliation	5	9.62	3	9.38
Perform one's own task without reconciliation	8	15.38	2	6.25
Others	9	17.31	5	15.63
Total	-	-	32	100.00

4.3.5 Great Advantages Receiving from Interdisciplinary Convergent Research Project

Investigation on the great advantages obtained from Interdisciplinary Convergent Research Project found 'Networking with various researchers' as the greatest advantage. Along with the finding, researchers in 2018 responded with confirming expandability of major field (34.62%) and academic curiosity about new fields (26.92%). Similarly, in 2019, researchers found that synergies from cooperation and academic curiosity (each 28.13%) and confirming expandability of major field (25.00%) as the great advantages. This can be interpreted as the Interdisciplinary Convergent Research Project encourages new convergence through converging and networking with various researchers as researchers from various fields cooperatively conducting research.

Table 18. Great Advantages Receiving from Interdisciplinary Convergent Research Project (Multiple Response)

Division	2018		2019	
	N	%	N	%
Academic Research Achievement	11	21.15	4	12.50
Network with various researchers	21	40.38	14	43.75
Synergy from collaboration	13	25.00	9	28.13
Academic curiosity about new fields	14	26.92	9	28.13
Confirming expandability of major field	18	34.62	8	25.00
Others	0	0.00	1	3.13

4.3.6 Suitability Composition for Convergence Research Team

The investigation on the appropriate number of team members for efficient convergence research, showed 5-7 team members as the most appropriate number of people and other response of ‘different according to the scale of research’ was also showed a higher percentage, Similarly, 3-4 were found as the number of majors most appropriate for convergence research.

In addition, the investigation on the ratio of humanities and science areas when deciding appropriate composition of researchers to efficiently carry out humanities-based convergence research showed 50% humanities + 50% science as the most appropriate ratio followed by 70% humanities + 30% science (26.92%) in 2018 and 30% humanities + 70% science (15.63%) in 2019, showing differences between the two years.

Table 19. Most Appropriate Number of Team Members and Majors for Convergence Research

Division		2018		2019	
		N	%	N	%
Appropriate Number of Team Members	Individual	0	0.00	0	0.00
	2-4	4	7.69	7	21.88
	5-7	31	59.62	13	40.63
	8 or more	4	7.69	2	6.25
	Different according to the scale of research	13	25.00	10	31.25
Appropriate Number of Majors	Others	0	0.00	0	0.00
	1-2	3	5.77	1	3.13
	3-4	30	57.69	20	62.50
	5-6	3	5.77	4	12.50
	7 or more, the more the better	1	1.92	0	0.00
	Number of majors has no influence	14	26.92	5	15.63
Ratio of Humanities and Science Researchers	Others	1	1.92	2	6.25
	30% Humanities + 70% Science	3	5.77	5	15.63
	50% Humanities + 50% Science	29	55.77	23	71.88
	70% Humanities + 30% Science	14	26.92	2	6.25
	Others	6	11.54	2	6.25
Total		52	100.00	32	100.00

4.3.7 Perception Toward Convergence Research

As a result of the investigation on the perception and level of safety for convergence research, all items scored 5 or more points on average, showing a high level of satisfaction for humanities-based convergence research and research output. In addition, the question asking for the willingness to conduct humanities-based convergence research again and intention to recommend to others scored high with an average of 6 or more. Especially, the statement of “I expect humanities-based convergence research to be continuously vitalized” showed the highest consensus.

Table 20. Overall Perception Toward Convergence Research

Division	2018		2019	
	M	Std	M	Std
I have a high level of satisfaction for humanities-based convergence research	5.77	1.277	6.03	1.092
I am satisfied with the conducted humanities-based convergence research outcome	5.75	1.046	5.88	0.942
I have an intention to conduct humanities-based convergence research again	6.06	1.018	6.16	1.298
I will recommend humanities-based convergence research to others	6.02	1.111	6.22	1.237
I expect humanities-based convergence research to be continuously vitalized	6.29	1.016	6.22	1.128

4.4 Value Changes of Convergence Researchers

In this part, region of highest degree acquired, experience in research, first time starting convergence research and the route to know about convergence research, reason and time of wanting to quit convergence research, goal and time to determine to continue, experience in recommending convergence research and factors to consider when composing researchers were investigated and analyzed.

4.4.1 Level of Education and Experience of Convergence Researchers

Regions where the highest educational degree was obtained was found to be 75.00%, Korea 25.00% overseas, 5 or less years of experience in research, including master’s and doctoral courses, was found to be the highest with 37.50%, followed by 10 or less and 20 or less years each scoring 21.88% and 18.75% of 15 or less years of experience.

Table 21. Region of Highest Degree Acquired and Research Experience

Division		N	%
Region of Highest Degree Acquired	Korea	24	75.00
	Overseas	8	25.00
Research Experience (including master's and doctoral courses)	5 years or less	12	37.50
	10 years or less	7	21.88
	15 years or less	6	18.75
	20 years or more	7	21.88
Total		32	100.00

4.4.2 Matters Related to Starting Convergence Research

The investigation on voluntary start of convergence research showed that 50.00% of the respondents voluntarily started, 28.13% started by chance and 21.88% of respondents did not start voluntarily.

The investigation on the first time started doing convergence research showed that 40.63% started within 3 years, which scored the highest, followed by 31.25% of within 1 year and 12.5% each of within 5 years and within 7 years, showing that the first time the respondents started convergence research is, in general, within 3 years. In addition, investigation on the route to know about convergence research found that 50.00% were through recommendation by acquaintance, 15.63% trends of the time and 9.38% by learning about acquaintances who are building careers in convergence research.

Table 22. Matters Related to Starting Convergence Research

Division		N	%
Started Convergence Research	Yes	16	50.00
	Know	7	21.88
Voluntarily	Started by chance	9	28.13
	First Time Starting		
Convergence Research	Within 1 Year	10	31.25
	Within 3 Year	13	40.63
	Within 5 Year	4	12.50
	7 or more	4	12.50
	10 or more	1	3.13
Route to Know about Convergence Research	While having drinks with acquaintances	0	0.00
	Radio, TV news	0	0.00
	Recommendation of acquaintance	16	50.00
	Magazine, Newspaper	0	0.00
	Learned about an acquaintance building career in convergence Research	3	9.38
	More career opportunities in new area compared to the majored area	5	15.63
	Get away from familiar majored area	2	6.25
	Convergence Research is the trend of the time	5	15.63
	Others	1	3.13
	Total		32

4.4.3 Reason and Time of Wanting to Quit Convergence Research

The investigation on the time of wanting to quit convergence research found within 1 year the highest with 43.75% of frequency. As for the reason of wanting to quit, the 46.47% responded as fear of unfamiliar challenge, scoring the highest, followed by 20.00% each of pressure on achievement and skepticism about the research results and 13.33% of conflicts among researchers.

Based on such findings, General Center for Convergence Research is capable of providing guidelines by Collecting and classifying problems that occur early in the research as a part of supporting convergence research teams and it is expected to need differentiated support suitable for each time period.

Table 23. Reason and Time of Wanting to Quit Convergence Research

Division		N	%
Time of Wanting to Quit Convergence Research	Within 1 year of starting convergence research	7	43.75
	Within 2	2	12.50
	Within 3	5	31.25
	Within 5 years or later	2	12.50
	Total	16*	100.00
Reason for Wanting to Quit (Multiple Response)	Conflict among researchers	2	13.33
	Inadequate research support	1	6.67
	Pressure on achievement	3	20.00
	Skepticism about research achievement	3	20.00
	Gap between major	2	13.33
	Fear for unfamiliar challenges	7	46.67
	Negative view of people with same major on the unfamiliar challenge	1	6.67
	Korean culture such as seniority (Notification without coordination)	1	6.67
	Stubbornness and extreme persistence of other major researchers leading to their major	1	6.67
	Generation and cultural gap with other researchers	1	6.67
Others	1	6.67	

* Non-Response: 16 Respondents

4.4.4 Time and Goal to Determine to Continue Convergence Research

As a result of the investigation on the time of making determination to continuous convergence research, it was found 65.63% of the respondents determined to continue within 1 year from the start, followed by within 2 years (25.00%) and within 3 years (9.38%). For the ultimate goal of continuing to pursue a meaningful research result, 50.00% responded as to deduce a meaningful

research result, showing the highest score, followed by because it is the time converging with other disciplines is necessary (37.50%) and social contribution (34.88%) As for other responses, making contribution to academic research, and training talented younger scholars who can converge with other majors and serve a bridging role.

Table 24. Time and Goal to Determine to Continue Convergence Research

Division		N	%
Time to Determine to Continue	Within 1 Year of Starting Convergence Research	21	65.63
	Within 2 Year of Starting Convergence Research	8	25.00
	Within 3 Year of Starting Convergence Research	3	9.38
	5 Years After Starting Research	0	0.00
	Total	32	100.00
Ultimate Goal to Continue (Multiple Response)	Social Contribution	11	34.38
	To keep the lab running	4	12.50
	To deduce meaningful research results	16	50.00
	Contribution to academic research	6	18.75
	To become a pioneer	0	0.00
	Because challenge is the vitality of life	6	18.75
	To make unique achievement	1	3.13
	To transform into a differentiated discipline	4	12.50
	Because it is the time converging with other disciplines is necessary	12	37.50
	To train talented younger scholars who can converge with other majors and serve a bridging role.	6	18.75
	Others	0	0.00

4.4.5 Serving a Bridging Role with Other Majors After Starting Convergence Research

It was sought to find how much the convergence researchers contribute to the activation of convergence research after they start the research.

Firstly, for the case of serving a bridging role with other majors after starting convergence research, will participate when suggested found the highest (37.50%), followed by promote and participate events of other majors (28.13%), actively represent the position of other majors (21.88%), showing that the respondents lead positive changes in understanding and participating with other majors after starting convergence research.

Table 25. Serving a Bridging Role with Other Majors After Starting Convergence Research

Division	N	%
Actively represent the position of other majors	7	21.88
promote and participate events of other majors	9	28.13
Working with other majors would cause more damaging, but try to work as a convergence researcher	4	12.50
Will participate when suggested found the highest	12	37.50
Total	32	100.00

In addition, 84.38% of the respondents indicated that they recommend convergence research, which can be interpreted as agreeing with the research value of convergence research.

Table 26. Intention to Recommend Convergence Research

Division	N	%
Yes	27	84.38
No	4	12.50
Others	1	3.13
Total	32	100.00

4.4.6 Factors to Consider when Composing Convergence Researchers

When it is difficult to construct a research group, most of the respondents chose receiving referrals from other teams thorough networking as the first alternative (40.63%). Thus, it is anticipated that if General Center for Convergence Research builds a pool of researchers for each subject and provides it to researchers, convergence researchers can participate in the convergence research that they have conceptualized and researchers who can provide consulting or advices can also be easily found. Other responses were found in the order of recruiting of a non-professional doctoral degree holder from other major inside and outside of the school (31.25%), and recruiting a graduate student (master and doctoral degree) from other majors inside of the school (28.13%), indicating that education background and experience are important consideration factors for convergence research.

Though receiving referrals from other teams thorough networking was selected to be more preferred than recruiting a graduate student or non-professional doctoral degree holder, the reason for this was found to be to foster future generations of scholars, which showed the highest percentage (62.50%), followed by because they are usually at the age of thinking flexibly (28.13%). Likewise, recruiting a graduate student or non-professional doctoral degree holder is found to take place with the future-oriented expectations of possibility and growth potential.

Table 27. Factors to Consider when Composing Convergence Researchers

Division		N	%
When it is difficult to construct a research group	Recruit a graduate student (master and doctoral degree) from other majors inside of the school	9	28.13
	Recruit a non-professional doctoral degree holder from other major inside and outside of the school	10	31.25
	Receiving referrals from other teams thorough networking	13	40.63
	Total	32	100.00
Reason for Recruiting a graduate student or non-professional doctoral degree holder	Easy to control the situation and opinions disagree	2	6.25
	Because they are usually at the age of thinking flexibly	9	28.13
	Because it is difficult to contact full-time faculty members of other majors	1	3.13
	To foster future generations of scholars	20	62.50
Total		32	100.00

4.4.7 Securing Position as Mainstream Academic Field

As for the last question related to securing a position as mainstream academic field, convergence researchers responded as Yes (87.50%). This indicates that they evaluate convergence research as having the potential value to become a single or mainstream discipline, rather than treating it as a device serving an instrumental role to help understanding mainstream disciplines or a phenomenon appeared as a trend.

Table 28. Securing Position as Mainstream Academic Field

Division	N	%
Yes	28	87.50
No	1	3.13
Convergence Research only serves an instrumental role to help understanding mainstream disciplines	3	9.38
Total	32	100.00

5. Discussion

In this study, it was sought to investigate the participation status and satisfaction level of HubCon regularly held at the Center for Convergence Research and find the measures to improve the services of General Center for Convergence Research which can simultaneously vitalize humanities-based convergence research, based on the requirements of the researchers.

Some of the issues raised in this study are as follows. First, as the overall level of satisfaction for HubCon was decreased compared to 2019, it was found necessary to reorganize the overall meaning and direction of each event held by General Center for Convergence Research and establish a channel to reflect the opinions of convergence researchers in the preparation process. From another aspect, because the convergence research teams continuing convergence research may have different interest than those who newly jointed the convergence research, events to vitalize networks for them should be promoted via small to medium scale seminars while planning events such as HubCon or symposiums around the topic that both type of convergence research teams pursue or have interests in. For instance, it must be considered that research teams continuing convergence research may find methodologies for convergence research, sharing of research achievement and activating networks limited to the business teams as a threadbare story.

Secondly, it was analyzed that the time requiring the restructure of support services of General Center for Convergence Research centering on the requirements and demands of convergence researchers has come. Based on the observation of increased use of services through the website, which is one of the services provided by General Center for Convergence Research, and the response of the convergence researchers that they have obtained meaningful information from the homepage, it is imperative to continue to provide quality information by activating the homepage focusing on the demand of convergence researchers in the future.

In addition, it seems necessary to contemplate for improvement measures for homepage operation in the future based on the opinions and comments of the convergence researchers who have not yet used the homepage of General Center for Convergence Research.

Therefore, firstly from the standpoint of homepage contents, General Center for Convergence Research needs to investigate on the demand to see what information has been requested by the convergence researchers who have not yet used the homepage and fortified information that is more frequently used and found meaningful. Secondly, from the standpoint of homepage promotion, General Center for Convergence Research has to actively promote the homepage to the convergence researchers who have not yet used the homepage by introducing cases or experiences of effectively using websites or holding various events via homepage. Thirdly, it is necessary to encourage the future homepage users to join by clearly introducing the services and data provided from the website and the reasons to use the website.

Thirdly, as the affiliation of General Center for Convergence Research changed to several different research institutes in the past, the Center was not able to become a stable agent who can continuously supplement stabilized services with new services. It is highly anticipated that periodically changing research organizations like General Center for Convergence Research which supports endlessly changing convergence research teams will make providing stable and consistent services difficult. In fact, the overall level of satisfaction for General Center for Convergence Research was found to be no less than 5.5 out of 7, showing that the center is well-recognized as an organization that can fully support convergence research. Similarly, the result from investigating the perception toward convergence research and level of satisfaction showed an average of 5 points or greater for all items, indicative of high levels of satisfaction and research outcome from humanities-based convergence research.

However, the Center is at the stage where it needs to find measures to establish a stable agent which can continuously improve standardized services and develop services, instead of settling for the present. In particular, investigation result identified 'Holding conference to strengthen networking among convergence researchers, 'Creating opportunities to share difficulties and know-hows of convergence research' and 'Holding seminars to share research achievement' as the most desired supportive roles of General Center for Convergence Research for convergence research, in the order given in 2018. On the other hand, the most desired supportive roles was found to be in the order of 'Colloquiums supporting convergence research,' and 'Promoting convergence research' in 2019. What convergence researchers wanted in the past were sharing of networks, know-hows, difficulties and research achievements whereas it was found that the researchers don't only expect event-type support such as the events held by General Center for Convergence Research, but also require the Center to provide indirect support, such as externally promoting and spreading convergence research, as well as in-depth research discussion by holding colloquiums with external experts.

Based on such response, General Center for Convergence Research needs to support the teams by signing MOU with experts or organizations, providing lectures and building and expanding networks via building a broad expert pool for the teams participating in the Interdisciplinary Convergent Research Project. Also, the Center also needs to make continuous efforts to more frequently expose convergence research to not only relevant researchers but also to the general public. For example, centering on the public information service utilizing press releases that can be searched by Naver and Google or through SNS activities, the Center needs to strengthen its role as a path to continuously and proactively promote the efforts and research achievement of researchers.

Fourthly, differentiated support according to the convergence researcher's research time and problems is required. As the time when convergence researchers find difficulties in convergence research for the most was found to be within 1 year from starting convergence research, having the highest percentage of 43.75%, it is anticipated to provide differentiated support for each research team. For example, General Center for Convergence Research should provide guidelines by collecting and categorizing problems occurring among the convergence research team in their early research phase such as changes in research method and solving conflicts among team members. On the other hand, for those research team continuing convergence research, supports should be provided from specified and detailed aspects by carefully listening their requirements and problems through small scale seminars or colloquiums. In addition, the researchers found the reason of difficulties in convergence research, in the order of the fear for unfamiliar challenges (46.67%), pressure on achievement (20.00%) skepticism about research results (20.00%) and conflicts among researchers (13.33%). From this aspect, General Center for Convergence Research can strengthen support by continuously introducing successful achievements and providing necessary information and data to the Convergence Research teams.

Fifthly, supporting convergence research can create a new convergence value. Previous studies demonstrate transferring and sharing of individual knowledge, creating new ideas and strongly bonding networks among researchers and building a foundation for continuous research as the potential advantages of interdisciplinary convergence research (Kim, 2012). In addition, it has

the advantages of enormously creating new knowledge by exploring and constructing new research topics that were not identified by existing disciplines that were trapped in their own framework (Hong, 2008), and leading to the birth of new discipline (Kim, Oh, Kim, 2012). The result of investigation on the advantages that convergence researchers received from the Interdisciplinary Convergent Research Project, based on such previous studies, the biggest advantage was found to be ‘networking with various researchers.’ Along the finding, researchers identified confirming expandability of their major field (34.62%), academic curiosity for new fields (26.92%) as the next biggest advantages in 2018. On the other hand, researchers identified synergy from cooperation and academic curiosity for new fields (28.13% each) and confirming expandability of their major field (25.00%) as the next biggest advantages in 2019. This indicates that the Interdisciplinary Convergent Research Project builds networks with various researchers as researchers from various major fields cooperatively conduct the research and promotes new convergences through converging.

Sixthly, it has influenced on the perception changes of convergence researchers participated in convergence research. They showed high willingness of conducting convergence research again and recommending convergence research to others with an average score of 6 or more points, especially showing the highest degree of consent to the statement of ‘I expect the humanities-based convergence research to be continuously vitalized.’ In addition, for the case of serving a bridging role with other majors after starting convergence research, convergence researchers found to lead positive changes in the level of understanding and participation such as participating when suggested (37.50%), promoting and participating events of other majors (28.13%) and actively representing the position of other majors (21.88%).

From another standpoint, interestingness of topic, unified goals and direction of convergence research, cohesion, communication, role sharing, practical outcomes, and social contribution were investigated and the result showed that the respondents have a positive and hopeful attitude toward the progress and value of their convergence research. Moreover, as for convergence research to secure a position as mainstream academic field, convergence researchers showed positive response of Yes (87.50%). This is indicative of their positive views on usefulness and growth potential of convergence research and expected to be a positive driving force in the future operation.

Seventhly, as a center supporting convergence research teams, it must be contemplated for the actual meaning of ‘network’ that convergence researchers refer to. For example, most of the respondents chose receiving referrals from other teams thorough networking as the first alternative (40.63%) when constructing a research group is difficult. Thus, it is anticipated that if General Center for Convergence Research builds a pool of researchers for each subject and provides it to researchers, convergence researchers can participate in the convergence research that they have conceptualized and researchers who can provide consulting or advices can also be easily found. In order words, it is required to strengthen external networks by signing up MOU with a wide range of convergence research organization along with building a labor pool together with convergence researchers.

6. Conclusion

The books of 'Miracle Made by Difference,' and 'Convergence Research Methodologies' recently published as an achievement of Interdisciplinary Convergence mention that convergence research calls for new ways of designing and proceeding during its research design process, though it cannot be identified as the correct answer the limitations of research method can be overcome by continuous reinforcement.

General Center for Convergence Research supporting convergence researchers needs to modify its roles and functions in line with ever-changing requirements and demands of convergence researchers by continuously monitoring and fully reflecting them to find the ways to effectively support convergence research of the researchers.

This study carries a great significance in that it investigated the requirements of researchers, as a part of such purposes, by studying the participation status and satisfaction level of HubCon regularly held at the Center for Convergence Research and deducing the improvement direction for the future services of General Center for Convergence Research. It is highly anticipated to be required to continuously research and have positive attitudes to find detailed improvement plan for the services provided by General Center for Convergence Research that the convergence researchers found useful as well as to enable improving the various factors found to be problematic.

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