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Status and Promotion Measures of International Science & Technology Innovators' Settlement in Daejeon

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Preface

Welcome.

This is Youngjoo Ko, President of Daejeon Institute of Science & Technology for Enterprise & People (DISTEP).



Creating innovative ideas is an important foundation to spearhead the 4th industrial revolution. To lay out such a foundation, systems and organizations that can openly collaborate along with the diversity of race, culture, and experience are required. Accordingly, Daejeon-City is emphasizing the internationalization of the city for major policies such as the “Plan for Fostering Daejeon as the Special City for the 4th Industrial Revolution” and the “Grand Design for Daejeon, a Global City of Science”.

Given such policy, foreign students, professors, and researchers who will lead the regional open innovation have registered an average of 6,000 people over the past 5 years, and the ratio of foreign personnel of science and technology to the population remains at the top among 17 cities and provinces nationwide. For the continuous local scientific industry-related promotion, economic development, and science and technology-based social innovation, it is crucial to prepare a plan for settlement in Daejeon for long to ensure that such foreign personnel involved in scientific and technological innovation can contribute to the development of the city, rather than simply stopping by Daejeon.

Accordingly, DISTEP has studied and analyzed policies and projects to help support foreign scientists and engineers in Korea and overseas. Furthermore, we have conducted a demand survey on the support policies for foreign scientists and engineers living in the Daejeon area to render a demand-based support strategy that would allow more global talents to settle in Daejeon. This report reflective of such contents can be used as the basic data for the policy to support excellent talents for the realization of the grand design of a global city of science moving forward.

DISTEP seeks to design a new paradigm to help prepare for the strengthening of the international position of Daejeon, the city of science. To this end, we are planning a project to attract excellent domestic and foreign talents to Daejeon and help them settle in the region. Furthermore, we intend to scientifically analyze the level of local businesses, industrial ecosystems, social innovation, and globalization, and establish and share the global innovative city strategy. In this process, we will continue to publish the report to help Daejeon become a global city of science that can be enjoyed by the citizens of Daejeon.

We kindly ask for your continuing support and enthusiasm from among the industry-academia research experts and citizens.

Thank you.

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Youngjoo Ko

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I Introduction

1. Background & Purpose of the Study

➤ Background

The local population, particularly the school-aged population*, continues to decrease, and the outflows of young and middle-aged** to the metropolitan area and other areas have continued.

* Population aged 6 to 21, attending elementary school to university / ** population aged 15 to 49

- It is necessary to address the imbalance in the supply and demand of manpower for local innovation based on science and technology by actively attracting and utilizing excellent overseas scientific and technological manpower.

Table 1-1 School-aged population in Daejeon for 2011-2020¹

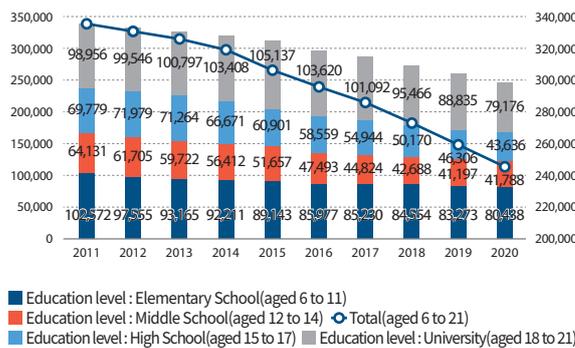
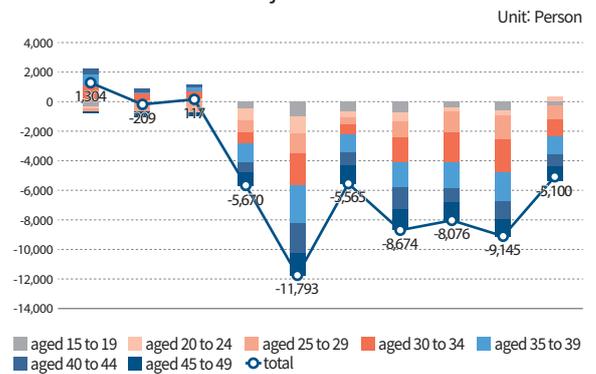


Table 1-2 Net moving population of young adults and seniors in Daejeon for 2011-2020²



At Daejeon, internationalization is emphasized across major policies such as the “Plan for Fostering Daejeon as the Special City for the 4th Industrial Revolution” and “Grand Design for Daejeon, a Global City of Science”.

- To realize the globally special city of the 4th industrial revolution, it is necessary to secure excellent human resources in the globally scientific industry to lead innovation and promote the utilization of the human resources that have been secured.

➤ Purpose

Conduct a basic survey on the daily lives and career development of foreign personnel involved in scientific and technological innovation in Daejeon and discover policy demands and present plans for policy development in Daejeon.

- (Analyze status) Analyze the current status of foreign personnel involved in scientific and technological innovation in Daejeon and related policies and present implications.
- (Implement policy demand survey) Analyze the background of foreign personnel involved in scientific and technological innovation’s inflow and conduct a satisfaction survey on the settlement environment.
- (Present action plan for Daejeon) Promote the settlement of foreign personnel involved in scientific and technological innovation at the Daejeon’s city level and seek ways to improve the utilization conditions.

1 Basic Education Statistics, Ministry of Education

2 Internal Migration Statistics, Statistics Korea

2. Scope & Method of the Study

➤ Scope

(Research subject) Daejeon's foreign personnel involved in scientific and technological innovation

- (Concept) Among those who do not have the Korean nationality and reside in Korea (Article 2 Subparagraph 2 of the Immigration Act), those who reside in Daejeon and support science and technology activities or perform duties
- (Scope) Highly educated (preliminary) professionals who have acquired specific visas (D-2, E-1, E-3)³

Table 1-3 Type of foreign personnel involved in scientific and technological innovation

| Classification | Description |
|--------------------------------|--|
| D-2 (International Student) | A person who seeks to receive a regular curricular education or conduct a specific research at a community college, university, or a graduate school established in accordance with the provisions of the Higher Education Act or at an academic institution equivalent to or higher than a community college established in accordance with the provisions of a special law |
| E-1 (Professor) | A person who meets the qualifications under the Higher Education Act and who seeks to engage in education, research, or instruction in a specialized field at an educational institution equivalent to or higher than a community college |
| E-3 (Researcher) | A person who seeks to engage in research in the field of natural sciences or research and development of advanced industrial technology at various research institutes in receipt of an invitation from public and private institutions in Korea |

Contents of the study

- A case study of policies to help support the settlement of foreign personnel involved in scientific and technological innovation in Korea and overseas.
- Figure out the current status of foreign personnel involved in scientific and technological innovation in Daejeon and related policies.
- Analyze policy demand intended for promoting the inflows and settlement of foreign personnel involved in scientific and technological innovation.

➤ Method



Reference research and analysis

- Review the related research data and policy research reports from other institutions.
- Review the current status of domestic and overseas policies and cases of projects supporting international science and technology innovators.

Implement the policy demand survey.

- Conducted written surveys and targeted group interviews (FGI) for personnel involved in science and technology innovation in Daejeon, and surveyed the driving factors for the influx in Daejeon, factors that promote and hinder settlement, and satisfaction with living, academic and working environment.

³ F-2 (resident) visa holders are excluded since they are in the pre-acquisition phase of the F-5 (permanent resident) visa, which do not meet the purpose of this study.

II

Case Analysis of Policies Providing Support for Settlement of Foreign Personnel Involved in Scientific and Technological Innovation

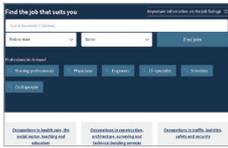
1. Overseas Status and Cases

► Providing social and institutional incentives to actively attract global talents in the field of science and technology innovation.

(Germany) Each local government in Germany attracts research infrastructures including leading research institutes to promote the influx of excellent foreign talents and create a regional innovation ecosystem.

- A small city like Jena also attracts leading research institutes such as Max Planck Institute and Fraunhofer Institute by providing an excellent research environment such as collaborating with the best researchers in each field and handling data.⁴
- The central government supports the regional growth by operating a matching system between foreign scientists and engineers and the research institutes (Research in Germany) and a comprehensive information portal platform (Make it in Germany) for foreign nationals looking for jobs, language courses, and daily life information.

Table 2-1 Case of the German government's support for the foreign personnel involved in scientific and technological innovation⁵

| Classification | Contents | | |
|------------------------------------|---|--|--|
| Support for employment and Startup | <p>Support for the career development of foreign personnel of science and technology in Germany, such as by providing recruitment / employment information, guidance on employment and startup plans, operation of startup support events, and spreading of success stories.</p>  <p>Provision of recruitment / employment information</p> |  <p>Employment-related informational videos</p> |  <p>Startup support event (Innovation Week)</p> |
| Support for daily life |  <p>German life information guide videos</p> |  <p>Summary of the cost of living in Germany</p> |  <p>Life and work consultation line</p> |
| Others |  <p>Information on research and academic funding support projects</p> |  <p>Online meetings</p> |  <p>Introduction to the language courses</p> |

⁴ Helmholtz Institute Jena (https://www.hi-jena.de/en/helmholtz_institute_jena/research_in_jena/)

⁵ Research in Germany (<https://www.research-in-germany.org/>), Make it in Germany (<https://www.make-it-in-germany.com/en/>)

(Sophia-Antipolis, France) Develop a site within the city as an innovative technology research facility and housing area and create a settlement base by granting institutional benefits to overseas companies and entrepreneurs.⁶

- Promote the influx of high-quality foreign industry and research manpower by attracting some spin-offs of multinational companies and overseas leading research institutes in the city.
- Support for the local adaptation of the influx of foreign workers by providing infrastructures for foreigners, including international schools, and holding various cultural, science, and technology-related events.
- Through regular seminars, information on technology, management, investment, etc., are exchanged, and exchanges between experts are strengthened and foreign local-based startups as local researchers are supported with their preparation of business plans and are provided with the necessary information when starting their business.

Figure 2-1 Case of Sophia Antipolis for Support of Foreigners' Startup



Source: Sophia Business Angels

- Actively attract foreign entrepreneurs based on the institutional support of the central government, such as issuing separate visas for excellent overseas startup manpower, allowing them for long-term stay, and simplifying their immigration process.

Table 2-2 Details of France's high-quality personnel's visa system⁷

| Classification | Passport Talent | French Tech Visa |
|----------------|---|---|
| Issued for | <ul style="list-style-type: none"> • French Ministry of Finance and Economy designated innovative company's employees • Entrepreneurs and investors • Highly skilled engineers • People with a national or international reputation, etc. | Entrepreneurs, employees, and investors who meet certain criteria (whether they are affiliated with an organization designated by the Ministry of Finance and Economy) are among those eligible for talent visa |
| Benefits | Maximum stay of 4 years | Simplified process of issuing talent visa |

⁶ Sophia Antipolis(<https://www.sophia-antipolis.fr/en/>)

⁷ The portal of French Administration(<https://www.service-public.fr/particuliers/vosdroits/F16922?lang=en>) / La French Tech(<https://lafrenchtech.com/en/how-france-helps-startups/french-tech-visa/>)

(Hsinchu, Taiwan) Actively cooperate with the central government to provide institutional and social incentives to promote the influx of high-quality technical manpower from abroad and support their process of settlement.⁸

- Provide housing for each type of residence (for singles, families, etc.) for workers in the complex, and establish international kindergartens, elementary, middle, high schools, and bilingual schools (Chinese, English) to create a foreigner-friendly settlement environment.
- In connection with the central government, actively promote factory sites and provide various incentives for resident companies and foreign professionals to attract excellent domestic and foreign talents and companies.

Table 2-3 Taiwan's Hsinchu complex's preferential treatment system for overseas personnel and companies

| Classification | | Benefits |
|----------------|---|--|
| Talent | Relaxation of the party's stay rules | <ul style="list-style-type: none"> • Issue employment gold cards (work, stay, multiple entry permit, and alien residence permit) for those who are expected to engage in professional work in Taiwan. • Provide qualifications to work as short-term school instructors in Taiwan for those with specialized knowledge or skills. • Extend the maximum employment permit period for foreigners employed in professional positions (3 years → 5 years). |
| | Relaxation of dependent family's stay rules | <ul style="list-style-type: none"> • Allow applying for permanent residency for spouses of high-quality professional talents, minor children, and adult children who cannot live on their own due to mental or physical disabilities. • Extend the visa period for visiting special talents in foreign countries and direct ascendant relatives of their spouses (6 months → 1 year). |
| | Social security and tax benefits | <ul style="list-style-type: none"> • Exempt from 6 months waiting period for health insurance subscription for spouses, minor children, and adult children who are unable to live on their own due to mental or physical disabilities who have received residence documents. • Only half of the salary income exceeding 3 million TWD for 3 years after entry of foreign professional talent is taxed. |
| Company | Tax benefits | <ul style="list-style-type: none"> • Reduce or exempt from business income tax within 5 years after the establishment of a manufacturing facility. • Exempt from business income tax on the capital increase in manufacturing for 4 years or 15% of new production facilities. • Maintain business income tax and value-added tax below 20% even after the tax reduction / exemption deadline has expired. • Exempt from import duties and cargo tax for some items used by tenant companies. • In the case of exporters, the business tax rate is set to 0%, cargo tax is exempted, etc. |
| | Guarantee of rights | <ul style="list-style-type: none"> • Foreigners who invest in Hsinchu Science Park are granted the same conditions and rights as the Taiwanese investors. • Recognize investment shares in patent rights and specialized technology, etc. |

8 Hsinchu Science Park - Regulations(<https://web.sipa.gov.tw/english/Regulations>)

2-1. Status and Cases in Korea (Central Government)

▶ They operate an online platform or business that supports daily life or career development for foreigners but mainly provides information on the metropolitan area.

(Study in Korea) It is a comprehensive system for foreigners studying in Korea operated by the Ministry of Education and the National Institute for International Education. This system provides foreigners with information on studying in Korea and universities (language institutes), immigration procedures, scholarships, and employment for the students studying in Korea or those wishing to study in Korea.

- However, there is no job information in Daejeon (as of February 16, 2022).
- As it is operated for (preliminary) international students, it contains information about each university and general life in Korea rather than the local life information.

(Contact Korea) Korea Trade Investment Promotion Agency operates a global talent recruitment support service that provides support for the talent discovery, selection, and process of settlement for domestic companies and institutions in need of global talents.

- However, about 96.67% of job postings require work in the overseas branches of domestic companies, and there is no job information in Daejeon (as of February 16, 2022).
- As the purpose of service is focused on providing information about job openings, in the Information column, only brief descriptions of the Korean culture and traditions are provided, rather than any information on daily life.

Figure 2-2 Contact Korea's operating system and major services

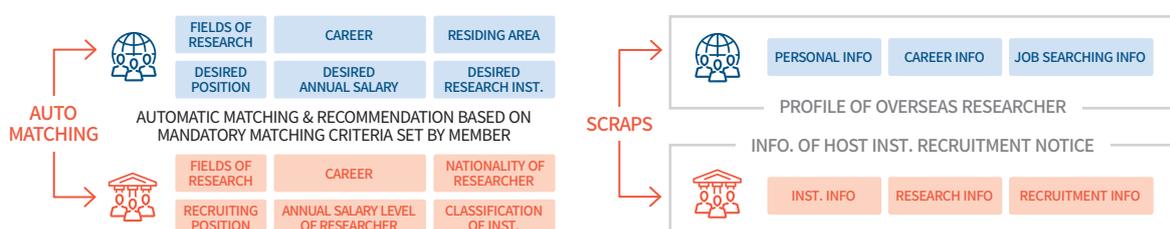


Source: Contact Korea (Korea Trade-Investment Promotion Agency)

(RPIK) It is a global job matching service operated by the National Research Foundation of Korea, which provides customized information between domestic research institutes in need of overseas talents and the overseas talents who desire to research in Korea.

- However, the employment information of government-funded research institutes and universities in Daejeon accounts for only 8% of the total (as of February 16, 2022), and for the platform, employment information of private companies is not included.
- There is no Daejeon-related information in the community tab that provides daily life information such as Life in Korea and Regional Stories.

Figure 2-3 RPIK's matching process



Source: RPIK (National Research Foundation of Korea)

Figure 2-4 RPIK management system and functions



- Provide personalized monitoring and management functions for job search activities for overseas talents and recruitment activities for domestic research institutes.
- Support for rapid communication and effective employment / recruitment activities by providing personalized services.
- Can immediately confirm talent matching information by providing individual automatic notification service via email.

Source: RPIK (National Research Foundation of Korea)

(Startup Immigrant Talent Nurturing Program (OASIS)) It is the supporting project providing 9 standardized education programs (intellectual property rights-related education, startup coaching and mentoring, startup space-related provision, commercialization funding support, etc.) by the Global Startup Immigration Center.

Table 2-4 Details of Support of OASIS⁹

| Classification | Contents |
|-----------------------------|---|
| Startup education | Education on intellectual property rights required for technology-based startups, education on entrepreneurship (including the Immigration Control Act) |
| Mentoring and consulting | Provide one-on-one mentoring and accelerating programs for prospective foreign entrepreneurs |
| Commercialization support | Patent application, prototype production, corporate establishment-related support, etc. |
| Provision of facility space | Provide startup space necessary for initial Startup |
| Events and networks | Operate foreign invention and Startup competition and networking events of startup space necessary for initial startup |

Status of OASIS connection with Daejeon

- In Daejeon, the Social Contribution Center of Chungnam National University operates the Foreign Invention Startup Exhibition, and Daejeon Integrated Support Center for Foreign Residents is linked to the Foreign Resident Startup & Trade Academy.
 - ※ Foreign Residents Startup and Trade Academy plans to focus on trade education only.
- Startup education, mentoring and consulting, commercialization support, and provision of facility space also need to be connected within the region.

Figure 2-5 OASIS-linked business in Daejeon



Poster of the 2021 Invention Startup Exhibition



Introductory statement of the Foreign Resident Startup and Trade Academy

Source: Chungnam National University Social Contribution Center (left), Daejeon Integrated Support Center for Foreign Residents (right)

2-2. Status and Cases in Korea (Other Local Governments)

➤ **A dedicated institution was founded for foreign residents to settle and adapt, and various businesses are operated, yet there is no business specialized in advanced personnel of science and technology innovation.**

(Seoul Global Center) They operate projects to help support the settlement and living convenience of foreign residents in Seoul, and provide various information through the Seoul Foreigner Portal.

- Only the general social contribution support projects for all foreign residents are in operation.

Table 2-5 Contents of Seoul Global Center's Projects¹⁰

| Classification | Contents |
|--|--|
| Provision of daily life consultation and information | Counseling for general life of foreign residents living in Seoul |
| Professional consulting service | Protect legal and institutional rights and interests through the experts' in-depth counseling |
| Psycho-emotional support | Provide psychological and emotional support for foreign residents |
| Korean language education | (General class) Provide customized Korean language education for foreign residents by level (TOPIK class) Prepare for the Korean Language Proficiency Test and strengthen the students' employment competency (Advanced class) Advanced Korean speaking, writing, communication, etc. |
| Democratic Citizens Academy | (Online education) Online education on visas, law, tax, labor, etc. (Video) After making an informational video, share it on the website, community, and social media (Card News) Provide useful information about life in Korea. After creating card news, share it on the website, community, and social media |
| Seoul Life Orientation | Provide essential information on living in Seoul for various new entrants such as international students and workers |
| Safety education | Provide online safety education multilingual video produced in cooperation with Seoul Fire Department |

- (Invest Seoul) They provide supports extended for startups in various fields, including technology startups, for foreign residents* who have the potential to start a business in connection with the OASIS project**.

* F-2 (Residence), F-4 (Overseas Koreans), F-5 (Permanent Residence), D-8-1 (Corporate Investment), D-8-4 (Technology Startup), D-9-1 (Trade Related Unique Transaction) holders

** Provide education related to OASIS business, and holding of Startup competitions, etc.

(Busan Foreign Residents Center) Conduct relevant research, investigation, policy development, and publication of data to help protect the human rights of migrant workers and migrants in the Busan area.

- Operate projects focused on enhancing the human rights of migrant workers rather than the personnel involved in science and technology innovation given the characteristics of the region.

Figure 2-6 Cases of Busan Foreign Residents Center’s Project



Labor and human rights consultation



Labor law education



Safety classroom

Source: Busan Foreign Residents Center’s Facebook

(Busan Foundation for International Cooperation) Promote the globalization of Busan through the exchanges between and for Busan citizens and foreign residents in the region.

- Provide opportunities for social integration for all foreign residents, including personnel of science and technology innovation.

Figure 2-7 Contents of the Busan Foundation for International Cooperation’s Project



Education to support foreigners’ Startups*



Global citizenship education



Life in Busan project

Source: Busan Foundation for International Cooperation’s Facebook

* Conduct the basic education and Startup competition in connection with the OASIS project.

3. Status and Cases in Daejeon-City

➤ A vision is presented for building a global city of science, and infrastructure is currently built to improve the current situation where the policies to support foreigners specialized in science and technology are insufficient.

(Daejeon-City) Aim to build a good infrastructure for global scientific talents to research, educate, find employment, and start a business through the “Grand Design for Daejeon, a Global City of Science” in 2021.

- Various support projects are carried out through the Daejeon Integrated Support Center for Foreign Residents established in 2021, yet services are provided for all foreign residents.

Table 2-6 Support projects for foreign residents of city-affiliated organizations

| Type of Project | Operating Organization | Project Overview |
|------------------------------------|--|--|
| Basic life education | Daejeon Support Center for Foreign Residents | (Subject to support) Foreign residents living in Daejeon (Application contents) Driver's License Written Test Lecture |
| | Immigration and Foreigners Policy Headquarters (Daejeon) | (Subject to support) Foreigners entering the region for the first time (Support contents) Basic laws and regulations of Korea, information on adaptation to Korean society, immigration-related laws and regulations, information on settlement in the region, etc. |
| Support for employment and Startup | Daejeon Support Center for Foreign Residents | (Subject to support) Foreign residents living in Daejeon (Application contents) Resume and self-introduction training, interview training, etc. |
| | Multicultural Family Support Center | (Subject to support) Married immigrants living in Daejeon (Support contents) Speech training, mock interview practice, etc. |
| Social integration | Daejeon Support Center for Foreign Residents | (Subject to support) Korean nationals and foreign residents / foreign workers (Support contents) Global food, cultural experience, etc. / legal advice on labor, etc. |
| | Multicultural Family Support Center | (Subject to support) Multicultural families and general citizens residing in Daejeon (Support contents) Cultural festivals, sports events, etc. |

(Universities and research institutes within the region) Promote projects focused on supporting the daily lives of the manpower enrolled or working in each institution.

- For most projects, only the personnel affiliated with each institution can apply, and hence, even the programs with similar characteristics are operated in duplicate by each institution.

Table 2-7 Foreign personnel support projects of local universities and research institutes

| Type of Project | Operating Organization | Project Overview |
|------------------------------|--|--|
| Support for consular affairs | Regional research institutes (IBS, etc.) | (Subject to support) Foreign researchers affiliated with government-funded research institutes (Support contents) Immigration management and visa issuance and change, etc. |
| | Regional universities (Chungnam National University, Hanbat National University, etc.) | (Subject to application) Students enrolled at each university (Support contents) Immigration management and visa issuance and change, etc. |
| Korean language education | Regional universities (Chungnam National University, Woosong University, etc.) | (Subject to application) Students enrolled at each university (Support contents) Korean grammar, reading, writing, etc. |
| Psychological counseling | Regional universities (Hanbat National University, KAIST, etc.) | (Subject to application) Students enrolled at each university (Support contents) Stress management, human rights violation and sexual violence counseling, etc. |

4. Preliminary Conclusion & Implications

➤ Unlike the overseas cities, in Korea, the programs to attract and support excellent foreign personnel involved in science and technology to create a regional innovation ecosystem are insufficient.

(Overseas cases) There is high level of social and institutional support at the central and local government levels to attract excellent talents in the science and technology field.

(Domestic cases) Led by the central government to attract foreign talents in science and technology fields, there is a lack of local government-level specialized support projects for advanced personnel involved in science and technology innovation.

- (Central government) It operates various support projects for foreign residents, including highly qualified foreign personnel involved in scientific and technological innovation, yet it is insufficient to reflect the information of Daejeon-City.
- (Other local governments) They Promote universal welfare projects for foreign residents in the region, not focus on the innovative personnel in the science and technology fields.
- (Daejeon-City) It promotes social contribution projects like other local governments due to the absence of an institution dedicated to foreign personnel involved in scientific and technological innovation in the region.

➤ To continuously attract excellent foreign personnel involved in scientific and technological innovation and promote their settlement in Daejeon, it is necessary to strengthen the linkage between the central government and local governments and establish a dedicated institution.

(Strengthen the link between the central government and local governments) Cooperate with the central government to enhance the effectiveness of foreign talent attraction measures in science and technology fields.

- (Connection plan) Implement support policies and system improvement at a level similar to that of major overseas science cities, actively displaying Daejeon area information in central government projects, etc.

(Establish an exclusive institute) Establish a general institute to provide specialized support in science and technology fields reflecting regional characteristics and the linked operation between individual projects operated by each institution.

III

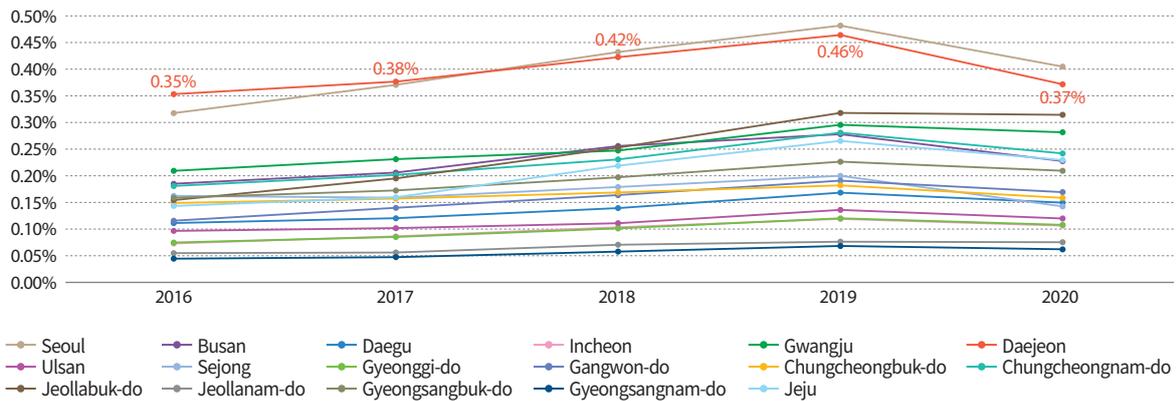
Status of Foreign Personnel Involved in Scientific and Technological Innovation and the Policy Demand Analysis

1. Status of Foreign Personnel Involved in Scientific and Technological Innovation in Daejeon-City^{11 12}

➤ Daejeon-City is inclined to show growth of concentration of international talents involved in science and technology innovation compared to other regions.

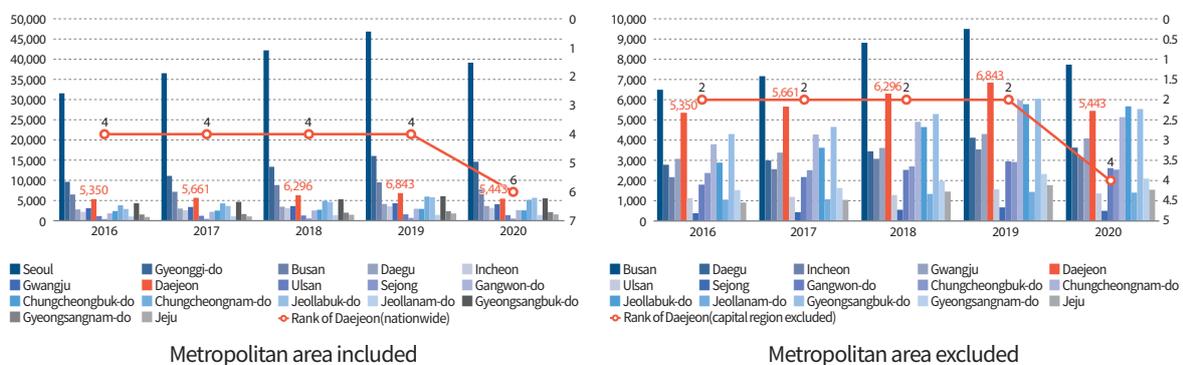
Daejeon-City ranked 1st or 2nd in terms of the ratio of personnel involved in scientific and technological innovation to the population among 17 cities and provinces nationwide for the past 5 years.

Table 3-1 Ratio of foreign personnel involved in scientific and technological innovation to the population of 17 cities and provinces nationwide (2016-2020)



Excluding 2020, when the foreigner inflow became difficult due to the outbreak of COVID-19, the number of registrations of foreign personnel involved in scientific and technological innovation from 2016 to 2019 maintained 4th in the country (and 2nd excluding the Seoul metropolitan area) and continued to rise.

Table 3-2 Number of registrations of foreign personnel involved in scientific and technological innovation in 17 cities and provinces nationwide (2016-2020)



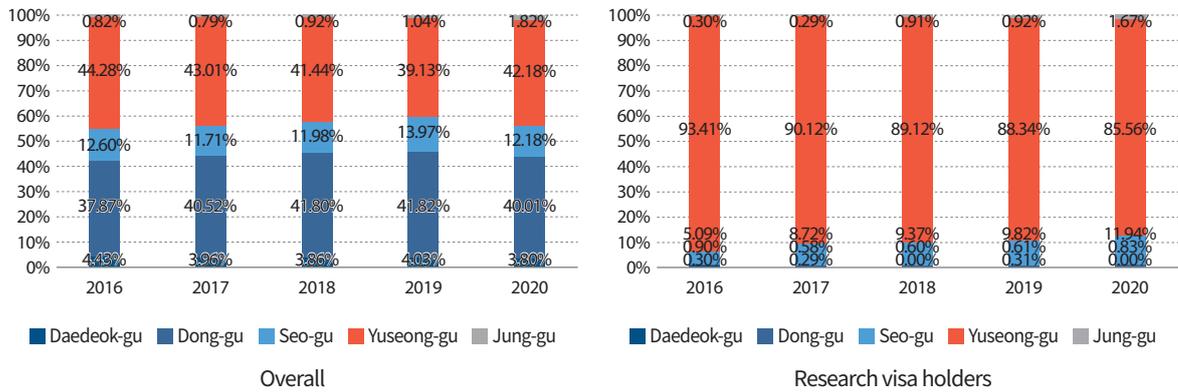
11 Statistics of Urban Planning, Land and Geospatial Informatix Corporation
 12 Statistics of Immigrants and Foreign Residency, Ministry of Justice

➤ In particular, there was concentrated registration of international talents involved in science and technology innovation in the Yuseong-gu and Dong-gu areas.

Except for 2018 and 2019, Yuseong-gu continues to rank 1st in terms of the number of registered foreign personnel involved in scientific and technological innovation.

- An average of 42.01% of the scientific and technological innovation workforce over the past 5 years, particularly 89.31% of research visa holders, have registered in Yuseong-gu.

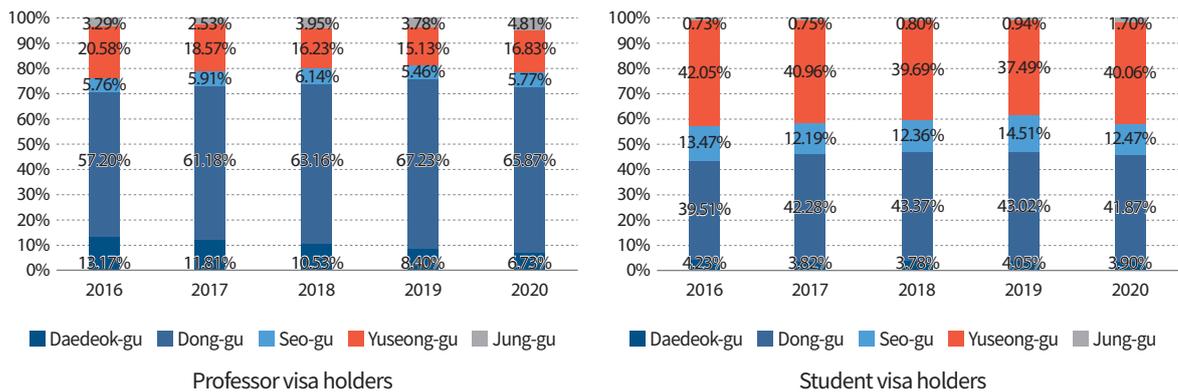
Table 3-3 Classified rate of registration of foreign personnel of scientific and technological innovation and research visa holders in Daejeon



In the case of professor and international student visa holders, many registrations are also made in Dong-gu.

- On average, 62.93% of the professor visa holders and 42.01% of the international student visa holders over 5 years have registered in Dong-gu.

Table 3-4 Classified rate of registration for professor and student visa holders in Daejeon

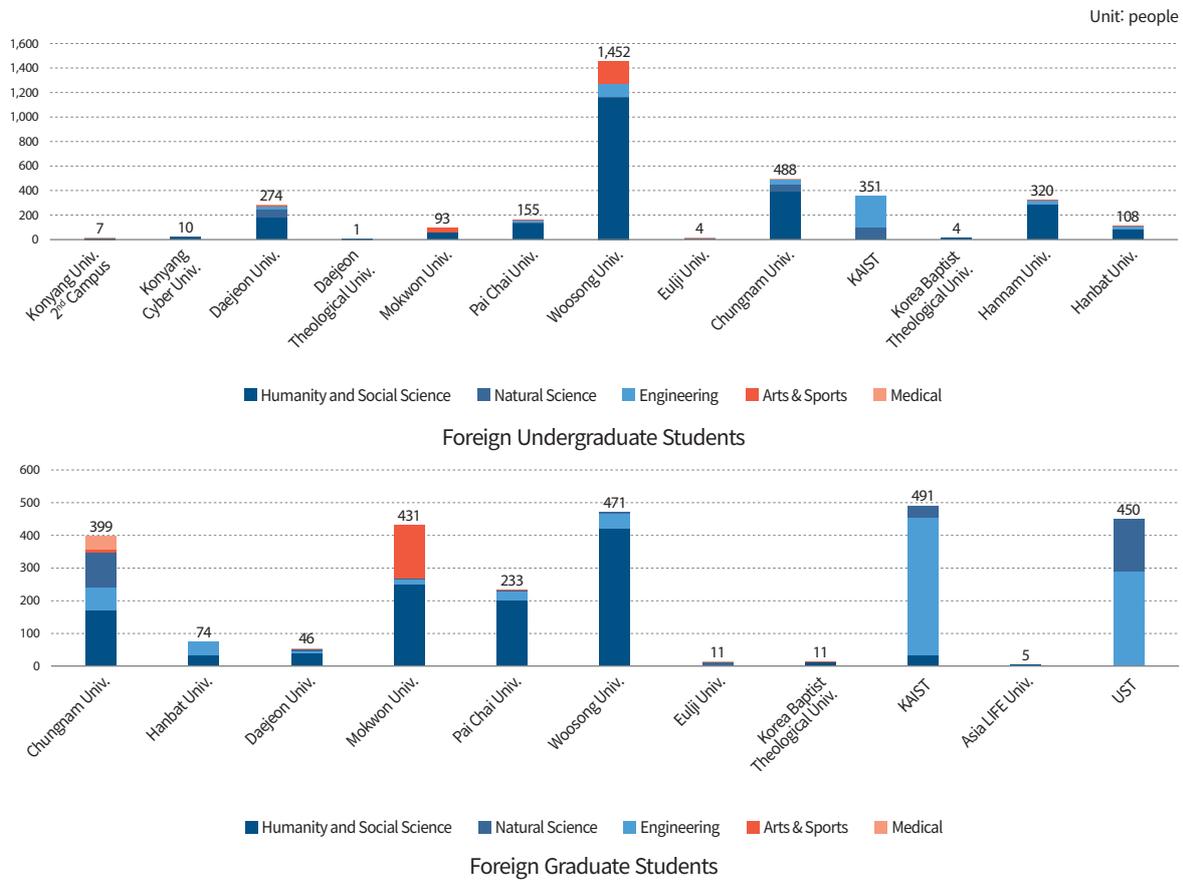


➤ There has been a lack of statistics specialized in foreign personnel of scientific and technological innovation within the region, limiting the analysis of related settlement conditions and the policy establishment for regional innovation.

In the case of foreign students, the Ministry of Education conducts a full investigation every year through the university notifications and statistics on foreign students from domestic higher education institutions.

- The basic status of foreign undergraduate and graduate students, such as affiliation and major, by year, can be identified, but the period of settlement and the route of movement (expatriation, employment in other local governments, etc.) must be separately investigated.

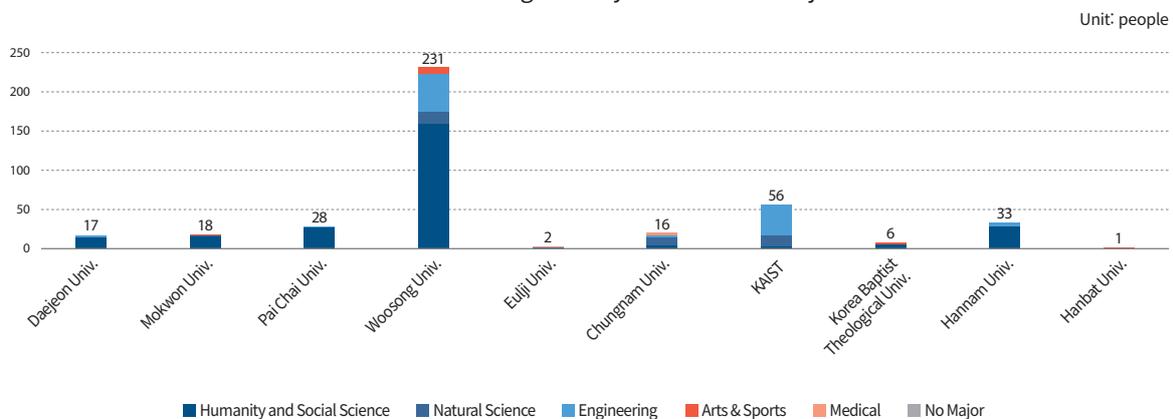
Table 3-5 2021 Foreign Undergraduate and Graduate Students Affiliation and Major Distribution



It is impossible to identify the settlement status of the professor visa holders, as with international student visa holders, other than the basic status of some personnel through the disclosure of the status of full-time international faculties at university by major and country.

* No separate statistics are available for the non-full-time faculty (i.e., professor emeritus, chair, visiting professor, etc.)

Table 3-6 2021 Full-time Foreign Faculty Affiliation and Major Distribution



In the case of foreign researchers, only some research institutes disclose the status of foreigners working within their research institutes, and hence, no data are covering all research institutes in the Daedeok Innopolis.

- For the research visa holders in Daejeon, a detailed analysis of the basic status, such as affiliation, nationality, and whether they are in charge of science and technology related work cannot be conducted.

2. Demand Survey for the Support Policy of the Foreign Personnel Involved in Scientific and Technological Innovation in Daejeon

- **A policy demand survey was conducted on the satisfaction of the settlement environment in Daejeon and the promotion of inflow and settlement for 243 foreign personnel involved in scientific and technological innovation in Daejeon.**

Overview of Survey

■ Purpose of survey

- (To identify policy needs) Satisfaction and needs survey on the settlement environment (life and career development, etc.) in Daejeon for foreign personnel involved in scientific and technological innovation in Daejeon.
- (To establish and implement policy) To prepare a plan to promote the settling-down procedure of foreign personnel involved in scientific and technological innovation in Daejeon and strengthen the inflow based on the results of the investigation.

■ Survey subject and method

- (Survey subject) 243 foreign personnel involved in scientific and technological innovation (international students, professors, researchers) in Daejeon
- (Survey method) Written survey and target group interview (FGI)

Samples by survey method

| Survey Method | Samples |
|-------------------------|---|
| Written survey | 5 international students |
| In-depth written survey | 172 international students, 2 professors, 34 researchers |
| Target group interview | International students (student researchers) and 30 researchers |

- (Survey language) English, Korean

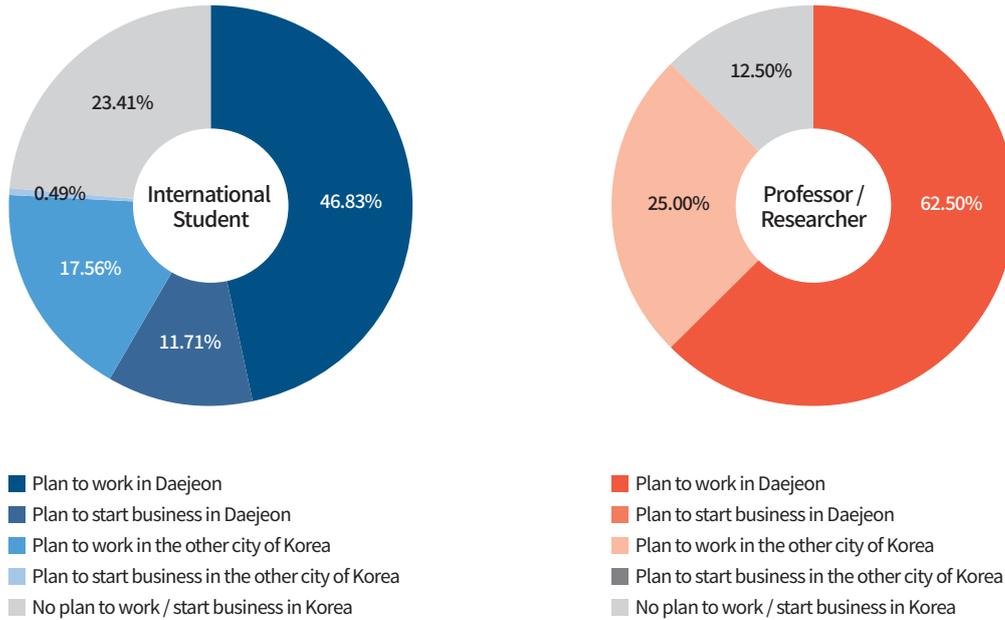
■ Survey contents

- (Settlement status of foreign personnel involved in scientific and technological innovation in Daejeon) Identify affiliated institution, gender, age, place of birth and country of origin, and period of stay (whether residing for more than 5 years).
- (Status of foreign personnel involved in scientific and technological innovation living in Daejeon) Identify factors that promote and hinder relocation of foreign talent in Daejeon, policies that require priority support among difficulties, and other suggestions for improving the settlement environment.
- (Identify demand for foreign personnel involved in scientific and technological innovation support policy in Daejeon) Identify the degree of need for functions (or programs) to be included in the establishment of the international talents support information system.

➤ In Daejeon, the intention to settle down for foreign personnel involved in scientific and technological innovation was high.

58.54% of the international students and 62.5% of the professors and researchers submitted responses desiring to continuously settle down in Daejeon.

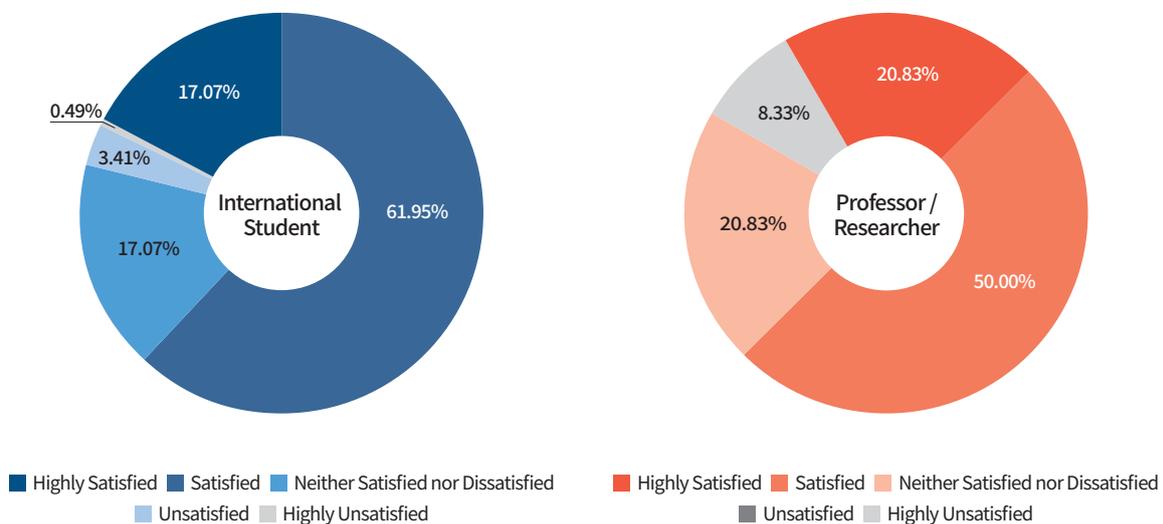
Table 3-7 Intention to settle down in Daejeon



➤ Daily life satisfaction of foreign personnel involved in scientific and technological innovation in Daejeon's is high, but they complain about difficulties in their career development (employment and startup).

79.02% of the international students and 70.83% of the professors and researchers answered that they are satisfied with their current living environment.

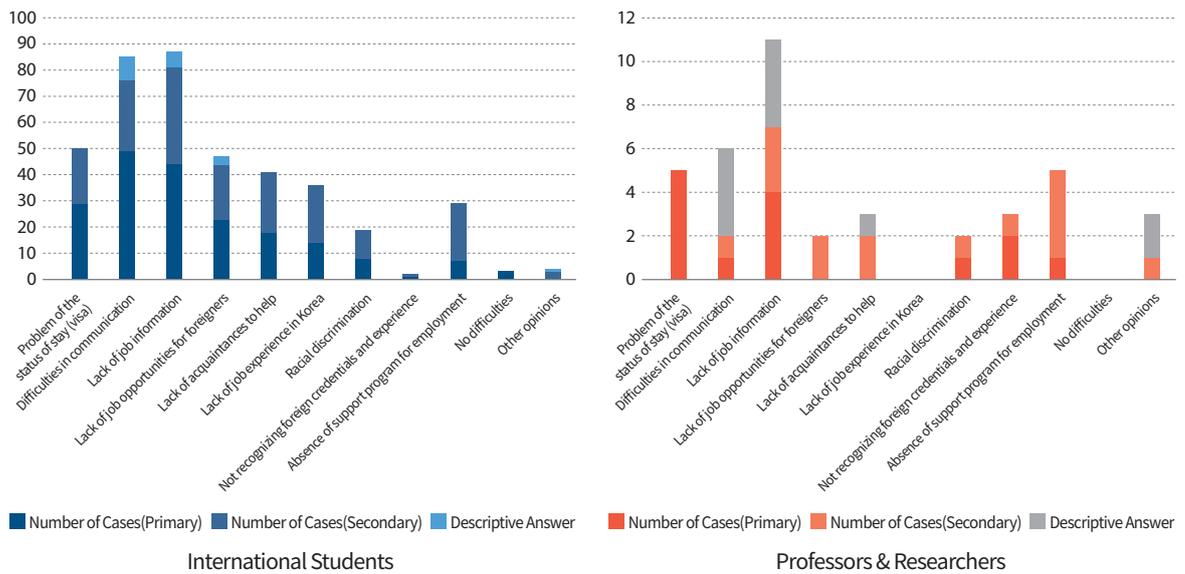
Table 3-8 Satisfaction with the living environment in Daejeon



However, 99.32% of the respondents said that they faced difficulties in finding a job or starting a business.

- As for factors hindering finding a job, the main responses were the lack of job information (21.09% for the international students, 15% for the professors and researchers) and communication difficulties (21.59% for the international students, 27.5% for the professors and researchers).

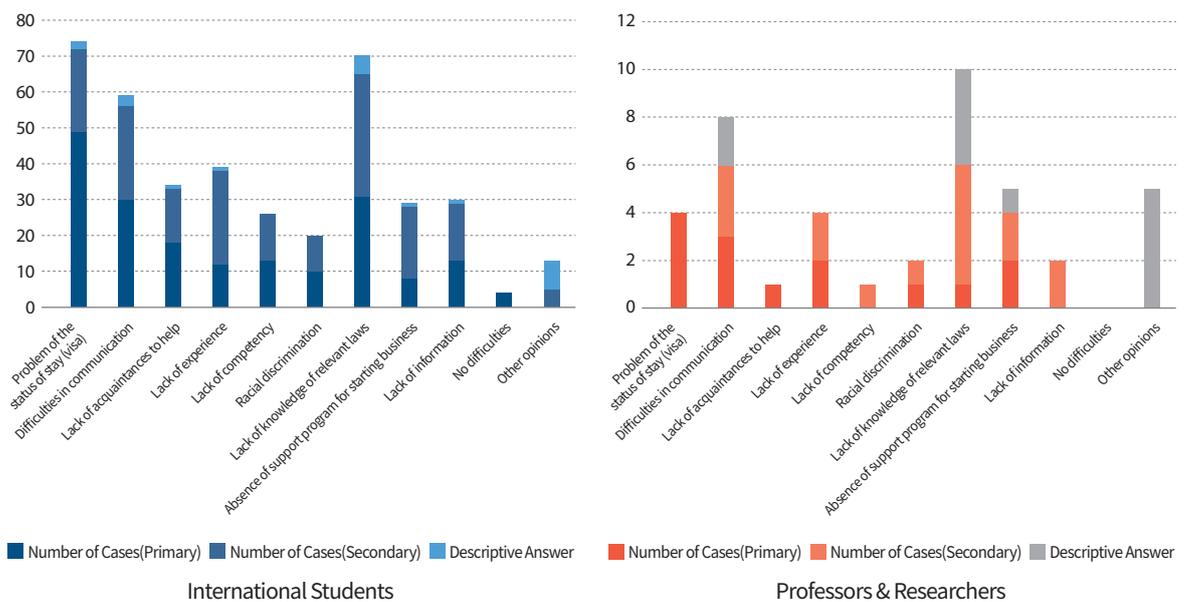
Table 3-9 Factors hindering finding a job in Daejeon



- The factors hindering starting a business were the problem of the status of stay (visa) (18.59%) and the lack of knowledge of relevant laws (17.59%) for international students, as well as the lack of knowledge of relevant laws (23.81%), and difficulties in communication (19.05%) for the professors and researchers (19.05%).

※ As for the other opinions, the main responses were the difficulty of taking out loans for startups and lack of space.

Table 3-10 Factors hindering starting a business in Daejeon

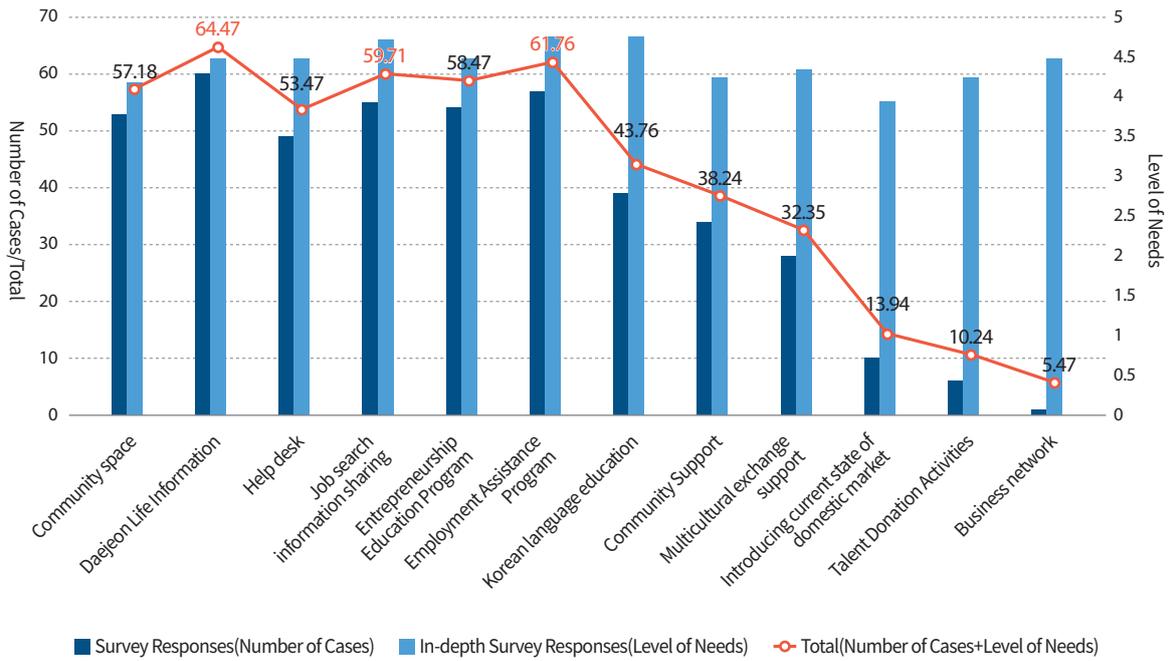


※ In the case of descriptive answers, the number of samples differs from other items as the answers are counted repeatedly when two or more difficulties are included.

➤ **Common demands are identified for the employment support programs and employment / recruitment information sharing services.**

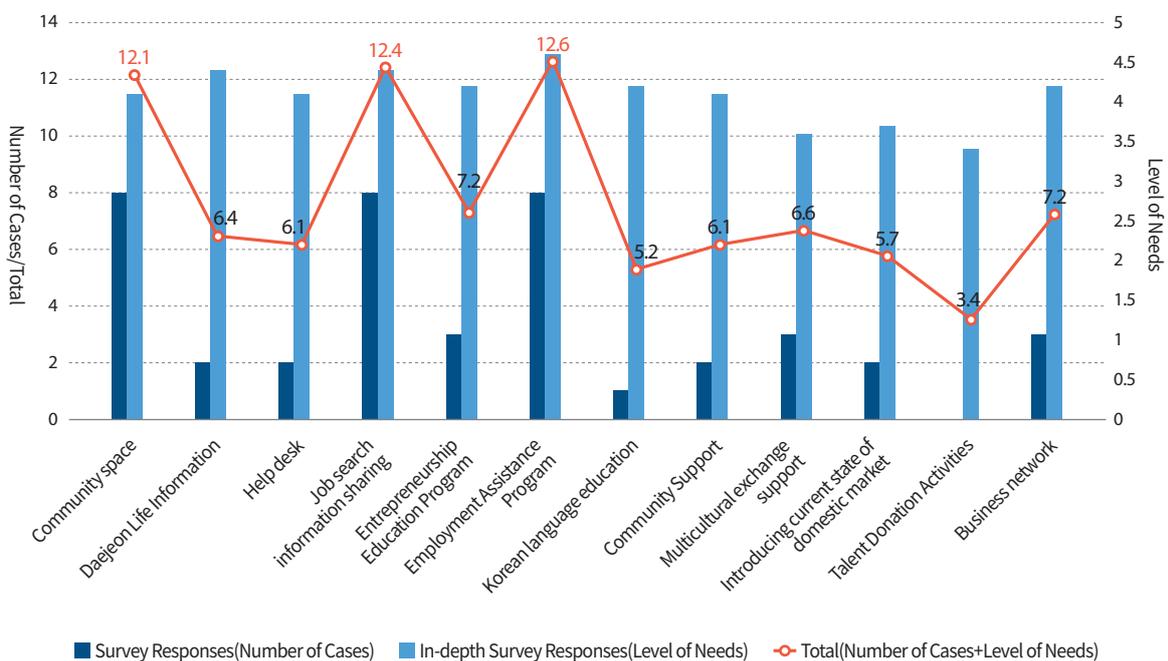
(International students) Responded in the order of Daejeon's living information, employment support program, employment / recruitment information sharing, and others.

Table 3-11 Urgency and priority by support project (international students' response)



(Professors and researchers) Responded in the order of employment support program, employment / recruitment information sharing, community space, and others.

Table 3-12 Urgency and priority for each supporting project (professors & researchers' response)



➤ Various demands are acknowledged for foreigner-friendly policies and opportunities for expansion of social integration.

| Classification | | Descriptive Response | |
|---|--|--|--|
| | | International Students | Professors & Researchers |
| Foreigner friendly policy | Expansion of facilities for using common languages | <ul style="list-style-type: none"> Expand English information signs. Deliver order application, restaurant menu board, website of major institutions in the district, and major official documents in English. Provide English service at public facilities (hospitals, schools, banks, call centers, etc.). Provide services in foreign languages in case of emergency (hospital visit, emergency medicine purchase, etc.). Develop applications or online platforms (social media, online cafes, etc.) to guide facilities (hospitals, libraries, real estate agencies, etc.) providing English services. Operate kindergartens and schools where classes are held in English. | <ul style="list-style-type: none"> Expand access to the public transportation departure and arrival information. Expand tourist information center. Support for legal advice services for foreigners. Establish international classes opened at kindergartens and schools. |
| | System improvement | <ul style="list-style-type: none"> Grant tax credit benefits. Subsidy for living expenses (child rearing expenses, transportation expenses, rent, etc.). Provide foreign tourism benefits. Expand related events and business promotion. Provide space to live with family. | <ul style="list-style-type: none"> Provide support for conditional residence or lower interest rates on housing loans. Reduce and exempt from child's kindergarten and school tuition. Pay living subsidies at a level similar to that of major overseas cities. |
| Expansion of opportunities for social integration | Expanded operation of basic education | <ul style="list-style-type: none"> Expand Korean language courses on weekdays. Provide education on Korean culture, history, law, and finance. | <ul style="list-style-type: none"> Expand Korean language classes (weekends and evenings). |
| | Promotion of cultural exchange | <ul style="list-style-type: none"> Promote domestic and foreign exchange programs (club activities, ambassador network, sports club, cultural exchange event, mentor-mentee program, etc.). Provide a space for exchange between domestic and foreign residents. | <ul style="list-style-type: none"> Organize clubs or small groups (travel, sports, etc.) for domestic and foreign exchange. (After the end of COVID-19) Promote cultural exchange events. |
| | Support for social participation | <ul style="list-style-type: none"> Provide a complaint window that can be used by foreign residents. Share Daejeon information (policy, cultural life, latest trends, etc.) via social media. Promote the active participation of foreigners in large-scale events such as forums and festivals (talent donation, etc.). Provide opportunities to experience social activities (internships, etc.). | <ul style="list-style-type: none"> Establish a foreign residents' association or operate a public organization that can communicate closely with foreign residents. Facilitate foreign employment through regional institution-university linkage. |

3. Preliminary Conclusion & Implications

- **Foreign personnel involved in scientific and technological innovation are registered at a higher rate than the other regions, but there is no system and DB to manage them.**

(Registration status of foreign personnel involved in scientific and technological innovation by city and province) For the past 5 years, the ratio of personnel involved in science and technology innovation to the population among 17 cities and provinces nationwide was ranked 1st and 2nd, and the absolute number of registered population has continued to increase.

- (Registration status of foreign personnel involved in scientific and technological innovation by gu(ward)) In particular, the registration was made very intensively in Yuseong-gu (research visa holders) and Dong-gu (professor visa holders).

(Other national statistics) It is possible to check the affiliation and distribution of majors only for some of the foreign personnel involved in scientific and technological innovation, such as statistics on foreign students at domestic higher education institutions, and the status of foreign full-time teachers by country.

- **It was identified that the intention of foreign personnel involved in scientific and technological innovation to continue to settle in Daejeon is high, but there are many difficulties in their career development.**

(Satisfaction survey results) 58.58% of the respondents wanted to continue to settle in Daejeon, but 99.32% answered that they had difficulties in finding a job or starting a business in the area.

(Demand for support policies) Demand was gathered in the order of employment support programs, employment / recruitment information sharing, and others (foreigner-friendly policies and expansion of social integration opportunities, etc.).

- **To attract foreign talents in the science and technology fields and expand their settlement in the region, it is necessary to establish a comprehensive support system focused on employment programs in related fields and employment / recruitment information sharing.**

(Comprehensive support system) Plans should be derived to utilize foreign personnel involved in scientific and technological innovation through the establishment of an online platform that provides career development information in the region, and the operation of a consultative body of related institutions, etc.

IV Expansion Strategy for Settlement of Foreign Personnel Involved in Scientific and Technological Innovation in Daejeon-City

1. Overall Analytical Result & Directions for Improvement

| Classification | Current Status | Direction for Improvement |
|----------------------|--|--|
| Case analysis | <p>(Overseas) Prepare social and institutional incentives to actively attract global scientific and technological innovation manpower.</p> <ul style="list-style-type: none"> • Social and institutional support at the level of other overseas science cities is necessary to attract outstanding talent. <p>(Domestic) Central government-led projects to attract foreigners are in operation, but local characteristics and information are not reflected.</p> <ul style="list-style-type: none"> • Lack of specialized support for advanced science and technology innovation manpower at the local level • Sporadic operation of support projects due to the absence of an agency dedicated to foreign personnel involved in scientific and technological innovation in the region | <ul style="list-style-type: none"> • Improve related policies and systems to the level of global cities. • Promote policy to settle and attract foreign personnel of scientific and technological innovation reflecting regional characteristics. <p>→ Establish global science and technology talent utilization system and mid-to-long-term policy.</p> |
| Statistical analysis | <p>(Overall Daejeon) Tendency exists to focus on foreign personnel involved in scientific and technological innovation compared to other regions.</p> <p>(Distribution) Concentration of foreign personnel involved in scientific and technological innovation in Yuseong-gu and Dong-gu</p> <p>(Statistical survey) Impossible to analyze detailed status due to the lack of specialized statistics and DB for foreign personnel involved in scientific and technological innovation.</p> <ul style="list-style-type: none"> • A basic DB is needed to establish policies to utilize innovative manpower, such as the movement of innovative manpower, settlement status, and ripple effect within the region. | <ul style="list-style-type: none"> • Implement exchanges between global talents in Daejeon. • Facilitate exchanges between local innovation actors (industry / academic / research / private / public) and global talent. • Implement regular surveys on foreign personnel involved in scientific and technological innovation and establish DB. <p>→ Facilitate global scientific and technological innovation workforce.</p> <p>→ Establish and manage DB for global scientific and technological innovation personnel.</p> |
| Policy demand survey | <p>(Satisfaction with settlement) Significant intention to settle and high life-related satisfaction of foreign personnel involved in scientific and technological innovation in Daejeon</p> <p>(Career development) Confirm difficulties in the career development</p> <ul style="list-style-type: none"> • Major factors: a lack of Startup and employment information, communication difficulties, status of stay, a lack of legal knowledge, etc. <p>(Area of demand) Identify common demand for employment support programs and employment / recruitment information sharing.</p> <ul style="list-style-type: none"> • There is a demand for other living information, employment / recruitment information, and community revitalization. <p>(Other opinions) Identify diverse demands for foreigner-friendly policies and expansion of opportunities for social integration.</p> <ul style="list-style-type: none"> • Expansion of public language infrastructure facilities, system improvement, expansion of basic education such as foreign languages and laws, cultural exchange, support for social participation, etc. | <ul style="list-style-type: none"> • Select priority tasks customized for demand and plan for and operate detailed programs. • Create a global employment and startup ecosystem in the region. <p>→ Establish a global science and technology personnel matching system in the region.</p> <p>→ Establish and utilize science and technology specialized support for employment and startup information system.</p> |

2. Recommendation for the Implementation Strategy & Detailed Tasks

Figure 4-1 The 3 largest implementation strategies and 6 detailed tasks



1 Develop a Comprehensive Scientific Talent Support System

- **Establish an integrated management promotion system for the efficient use of global personnel involved in science and technology innovation and the planning and operation of related policies and programs.**

(Establish mid to long-term plans) Establish mid to long-term plans for the foreign personnel involved in scientific and technological innovation for consistent and continuous policy support.

- Set the direction of support policies, projects and plan for major programs.

(Organize and operate a specialized institution) Organize a specialized institution to support the entire cycle (arrival → acclimation → settlement → integration) of foreign personnel involved in scientific and technological innovation.

- Perform the role as a hub for each institution that operates support projects for foreign personnel involved in scientific and technological innovation in Daejeon, such as local universities, government-funded research institutes, and the global talent visa center (located at the KAIST).

(Integrated DB management) Establish and manage DB of the foreign personnel involved in scientific and technological innovation in the region.

- Implement regular surveys to identify the current status of foreign personnel involved in scientific and technological innovation, and use the survey results as basic data for policy establishment.

- **Make systems and support programs efficient to ensure that Daejeon can grow into a global city of science where excellent foreign talents are active as local constituents after their arrival.**

(Institutional improvement) Facilitate the influx and settlement of excellent talents by providing systemic benefits such as reduction of their children's tuition and lower interest rates for housing loans for local strategic sector personnel such as those in the science and technology fields.

- Improve effectiveness by actively promoting and utilizing systems that are already in operation for international talents such as the Global Talent Visa Center.

(Strengthen connection with the central government) Create synergies by operating the international science and technology innovators support systems and projects in connection with the central government's regional development projects.

- Enhance the efficiency of project planning and operation by linking with ministries such as the Ministry of Justice, the Ministry of Science and ICT, and the Ministry of SMEs and Startups, and at the same time, derive leading examples by reflecting regional characteristics.

(Expand cooperation between related organizations) Enhance the accessibility and effectiveness of existing projects by strengthening cooperation between organizations that support international talents.

- Connect and unify similar projects and promote efficiency and effectiveness through the cooperation between organizations, such as project promotion and joint operation.

2 Expand the Career Development Related Infrastructures

➤ Promote employment and startup support projects to establish networks and facilitate collaboration between related institutions inside and outside of the jurisdiction for the full cyclical management of international science and technology innovators.

(Establish a consultative body) Establish a network between institutions that retain international science and technology innovators or operate a target business.

- Promote expert exchange and business linkage by forming a local working level network and a consultative body with the central government and other local governments.

(Plan for linked business) Jointly plan for employment and startup support projects for international science and technology innovators to enhance the effectiveness of the established network.

- Operate a global internship program where international students and researchers from sister cities of Daejeon can work as interns at industry, academia, and research facilities in the region.
- Operate the Daejeon Global Talent Matching Service (on- and off-line) that connects international students in Daejeon with the local companies or research institutes.

➤ Stimulate community interaction between the local and international residents to ensure that foreign personnel involved in scientific and technological innovation can more promptly integrate into the local community.

(Promote exchanges between Koreans and foreigners) Promote exchanges between local and international science and technology innovators to promptly adapt to the local community.

- Create a space for exchanges between scientists and engineers in Yuseong-gu, where international science and technology innovators mainly reside.
- Plan for and operate the programs to promote exchange and communication between domestic and international science and technology innovators, such as workshops, tour, and mentoring programs.

(Support for social integration) Promote social integration by increasing opportunities for the international science and technology innovators to directly participate in local community activities.

- Establish a venue through which opinions of international science and technology innovators, such as the foreign residents' associations, can be reflected in policy.
- Promote the active participation of foreigners in large scaled events such as local forums and festivals (talent donation, volunteer work, etc.).

3 Create a Global Urban Environment

▶ Establish and operate an online platform where excellent talents within and outside the region can easily access and exchange local information.

(Provide local information) Provide information on living and career development in the region that foreign personnel can utilize.

- Introduce policies and projects to support the foreigners' process of settling down and tourism in the region in connection with the 'Living in Daejeon' website of Daejeon.
- Provide employment / recruitment information and matching service in the region in connection with the RPIK system of the National Research Foundation of Korea.

(Create an online community) Provide an online meeting place to promote exchanges between locals and international science and technology innovators.

- Create an environment where foreigners directly produce and consume content, such as information sharing, purchase of used goods, and recruitment of club members.

(DB development and management) Establish and manage international science and technology innovators DB registered in Daejeon through the system subscriber information collection and analysis.

(Operate online help desk) Provide online counseling service related to living and working in Daejeon.

- Legal (labor and human rights, etc.) consultation area could be linked with the Foreign Residents Consultation Center operated by Daejeon Integrated Support Center for Foreign Residents.

▶ Improve the settlement environment for international science and technology innovators to attract and promote settlement of global talents.

(Strengthen use of English) Attract international science and technology innovators by expanding English speaking environment.

- Recruit professional staffs who can provide services in English at public facilities (hospitals, schools, banks, call centers, etc.).
- Establish and operate international classes at kindergartens and schools in Dong-gu and Yuseong-gu, where foreign personnel involved in scientific and technological innovation mainly reside.

(Expand infrastructure) Improve living convenience to attract talents to settle.

- Provide residential facilities and childcare facilities for families to live in Dong-gu and Yuseong-gu, where foreign professors and researchers mainly reside.
- Translate information signs, delivery order applications, restaurant menus, websites of major institutions in the district, and major public documents into English.

(Provide basic literacy education) Provide daily life-centric education to ensure that international science and technology innovators can adapt more promptly after their arrival.

- Provide educational courses on finance, Korean culture, history, and law for international students, and weekend and evening Korean language courses for research personnel.
- Provide support for foreign Korean language clubs at local universities and research institutes.

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