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## Introduction to **BK21 Program**

Korea's flagship talent-fostering program  
for the past two decades

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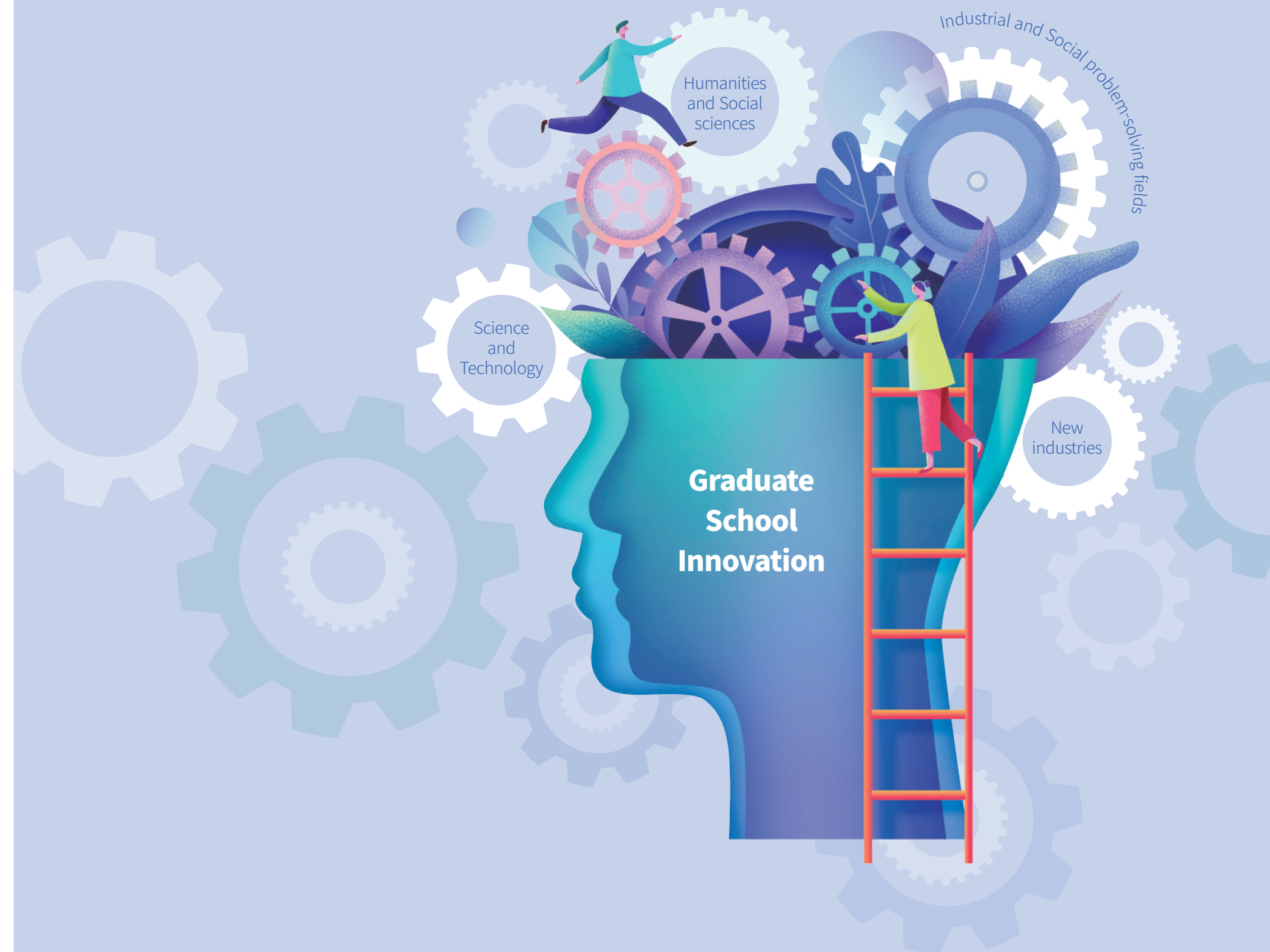
Korea has been implementing various research funding programs to enhance its expertise and competitiveness in academic research. At the center of these is the BK21 Program, which is supported by the Ministry of Education and the National Research Foundation of Korea.

(Elsevier report, 2020)

”

Brain Korea (BK) 21 was launched in 1999 as a creative talent-fostering program aimed at improving the educational environment and R&D capabilities of Korea's graduate schools. Since its establishment, BK21 has contributed to raising the country's research expertise and competitiveness to a global level while laying the groundwork for nurturing and fostering future academic generations; the history of BK21 is entwined with the history of higher education advancement in Korea.

BK21 differs from other research funding programs in that it directs most of its funds toward supporting master's and doctoral program students and young aspiring researchers who will lead the way in academia in the future, providing them with a robust educational and research environment where they can fully immerse themselves in research. Currently, the 4th BK21 Program (2020-2027) is underway. It is worth noting that the 4th BK21 Program has newly established a budget for Graduate School Innovation Support, and this effort is expected to further strengthen the foundation of the research-oriented university ecosystem through institutional innovation in graduate schools, mainly driven by university headquarters.





# History and Major Achievements of BK21 Program

BK21, jointly supported by the Ministry of Education and the National Research Foundation of Korea.

## (1999-2006) 1st BK21

Established the institutional foundation for a research-oriented university ecosystem

- Contributed to the creation of a competitive research environment in universities and recognized as a successful model by the Deutsche Bank institute, US high schools, and other foreign entities
- Led to an increased number of publications in renowned domestic and international journals based on the research expertise of the participating graduate students

[Number of SCI papers in science & technology published by Korea]  
- 9,444 papers (1998) → 23,515 papers (2005, ranked 12th in the world)  
※ Among them, about 34% were supported by the BK21 Program

## (2006-2013) 2nd BK21

Solidified the research-oriented university ecosystem while intensively fostering talented individuals in key research areas for national interests

- Contributing to strengthening the research environment of universities and fostering academic future generations by providing graduate students with consistent financial support

[Number of top 200 universities in QS World Universities Rankings]  
- 2 universities (2007) → 6 universities (2012)  
[Employment rate of participating graduate students]  
- 91% (BK21 participating graduate students) > 78% (non-BK21 graduate students)

## (2013-2020) 3rd BK21 (BK21plus)

Fostered master's and doctoral-level talent with a creative mindset while strengthening the role of universities as a hub for creating original research outcomes

- Contributed to enhancing research capabilities by improving the quality of research work conducted by the BK21 participating personnel

[Number of papers presented at conferences and impact factor (IF) of individual researchers]  
- For participating graduate students: 1.35 papers presented (2013) → 1.4 papers (2017) / IF 1.36 (2013) → 2.3 (2017)  
※ 2.2 times higher than non-BK21 graduate students  
- For participating professors: IF 16.5 (2013) → 21.4 (2017)

- Contributed to elevating domestic universities to a global level

[Number of top 100 universities in QS World Universities Rankings]  
- None (2004) → 5 universities (2019)

- Produced about 7,500 talented individuals as academic future generations each year (70%: masters / 30%: PhDs)  
※ Employment rates and satisfaction were higher among the BK21 participating personnel compared to non-BK21 personnel



(2005) 1st BK21 Achievements Exhibition



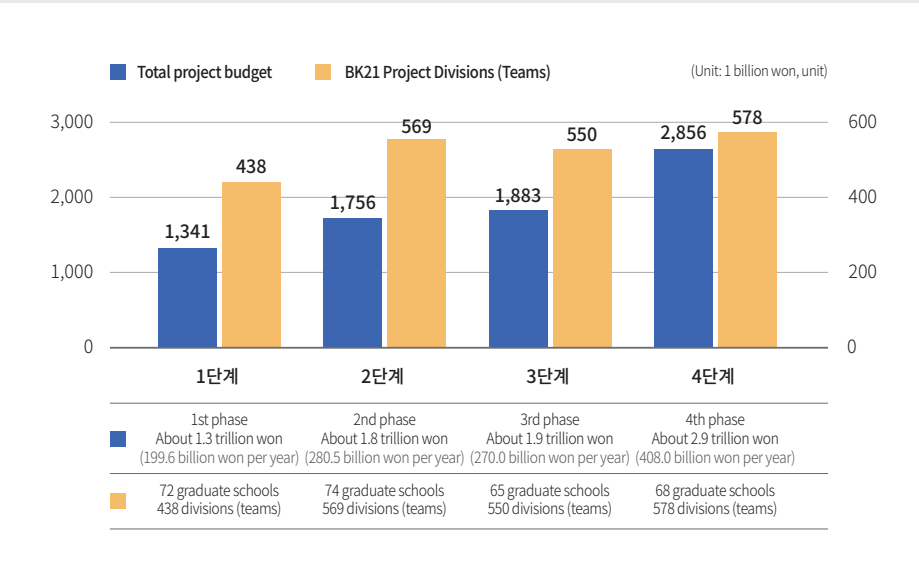
(2012) 2nd BK21 Achievements Exhibition



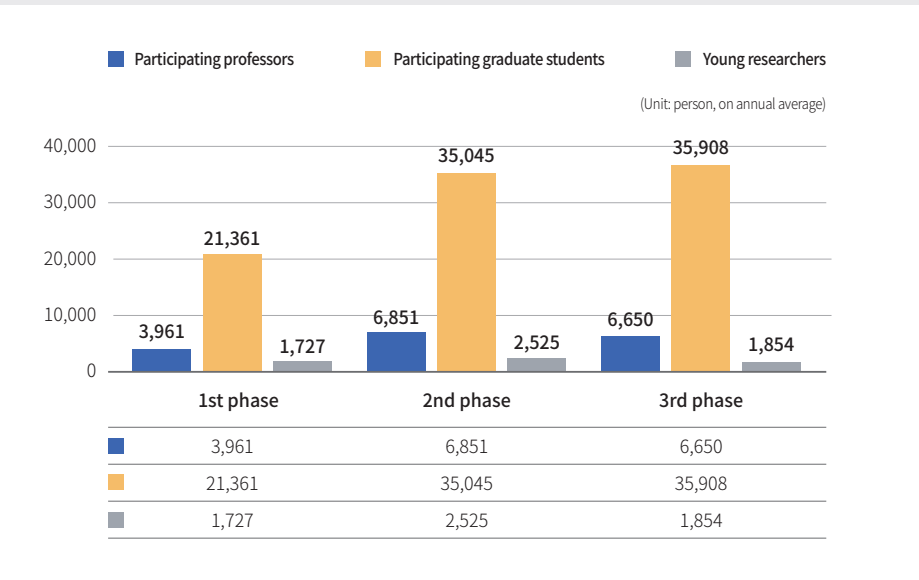
(2019) Symposium to celebrate the 20th anniversary of the BK21 Program

## Current Status of Support for BK21 Program by Phase

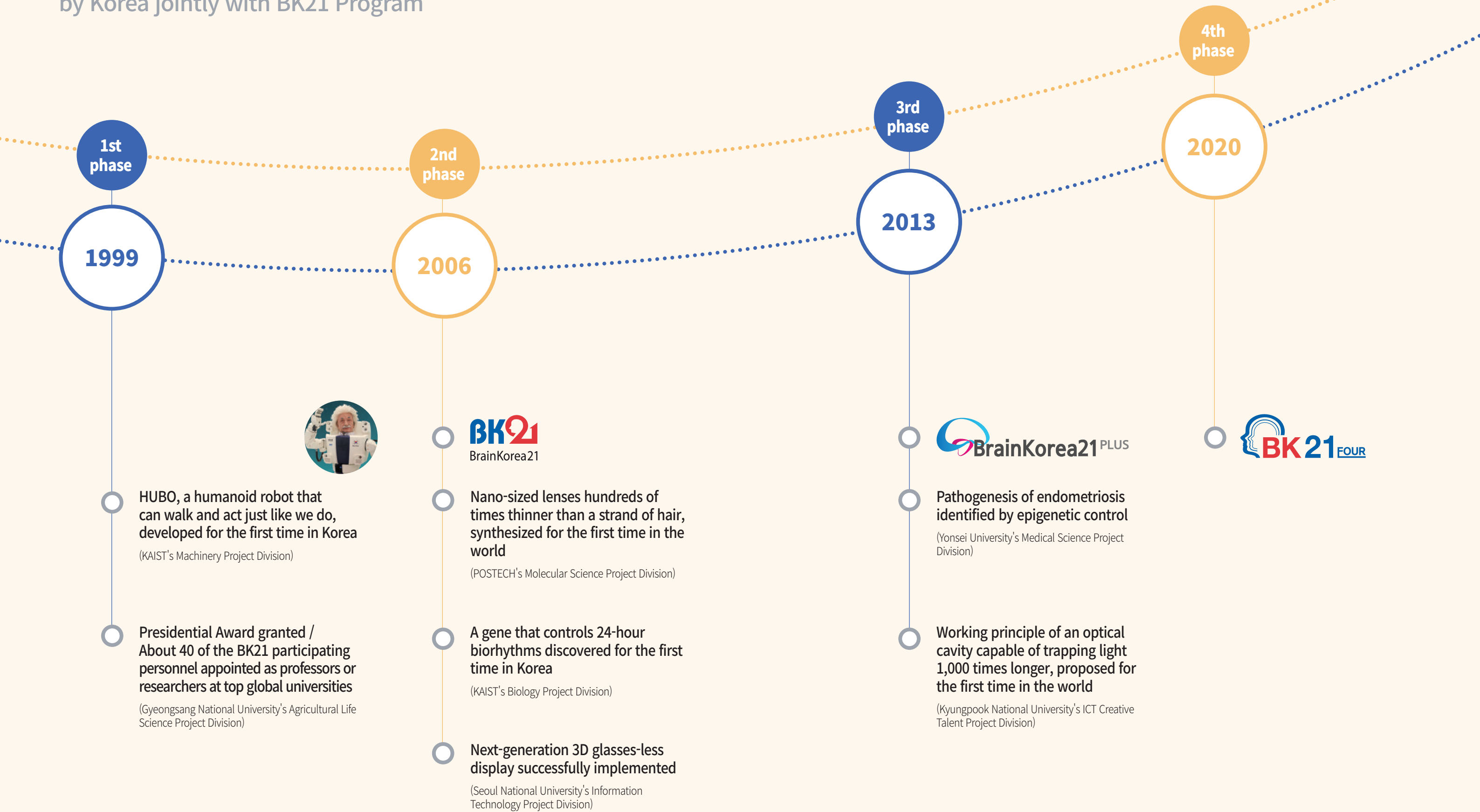
### Financial Support for and Current Status of BK21 Project Divisions (Teams) (Selection criteria)



### Current Status of BK21 Participating Personnel



Success stories in science and technology achieved  
by Korea jointly with BK21 Program



# Overview of 4th BK21 Program

## Vision and Goals

Vision	To foster world-level research-oriented universities			
Goal	• To enhance research capabilities in key academic fields and foster academic future generations • To reshape the graduate school system and improve the quality of graduate-school education in a substantial manner			
Direction	Strengthening research competitiveness	Fostering master's and doctoral-level researchers	Improving the quality of graduate-school education and research in a substantial manner	Fostering researchers to meet demand at the national and societal levels
Details	<ul style="list-style-type: none"><li>Promoting qualitative evaluation of research work</li><li>Providing support to allow research outcomes to be shared by and contribute to other fields, including economy, society, and culture</li></ul>	<ul style="list-style-type: none"><li>Providing support to more master's and doctoral program students</li><li>Expanding research scholarships to help students fully immerse themselves in learning and research work</li></ul>	<ul style="list-style-type: none"><li>Enhancing the curriculum and academic management in a more substantial manner</li><li>Improving the fundamentals of graduate schools by establishing a budget for Graduate School Innovation Support</li></ul>	<ul style="list-style-type: none"><li>Launching new projects for fostering innovative talent</li><li>Intensively fostering talented researchers in the country's key industrial areas</li></ul>

## Program Structure and Scale of Support

Program type	Support unit		Scale of support
	BK21 Project Division	BK21 Project Division & Team	Project budget and implementation progress
Program type	Future-Oriented Talented Leading Program	Science & Technology (80%) (Basic science 20%, applied science 60%)  Humanities and social science (20%)	Science & Technology (80%) (Basic science 20%, applied science 60%)  Humanities and social science (20%)
	Innovation-Oriented Talented Leading Program	New industries (80%) (Top-down)  Industrial, societal problem solving (80%) (Bottom-up)	-
	Graduate School Innovation	Graduate School Innovation Support Budget (20 university headquarters)	-
			408.0 billion won per year (A total of 2.9 trillion won over the period of 7 years)
			578 BK21 Project Divisions & teams from 68 graduate schools
			Graduate school innovation support to 20 schools (National 10, regional 10)

## Program Implementation Goal

To foster world-level research-oriented universities mainly based on university headquarters by establishing a budget for Graduate School Innovation Support



### QS World Universities Rankings

Number of top 100 universities:  
5 (2019) → 7 (2027)  
Number of top 200 universities:  
7 (2019) → 10 (2027)



### QS World Department Rankings

Number of top 50:  
61 universities (2019) → 70 universities (2027)  
Number of top 100:  
138 universities (2019) → 150 universities (2027)

To foster talented researchers tailored to each academic field and new industry



Providing support to over 19,000\* talented master's and doctoral program students each year over the upcoming seven years

\*About 12,600 students for the Future-Oriented Talented Leading Program and about 6,400 students for the Innovation-Oriented Talented Leading Program each year

Providing educational and research support to about 1,500 young researchers each year

Improving the quality of education and research work



Providing consistent support to help graduate students fully immerse themselves in research work

Number of citations of SCI papers published by Korea  
Ranked 13th (2019) → 10th (2027)

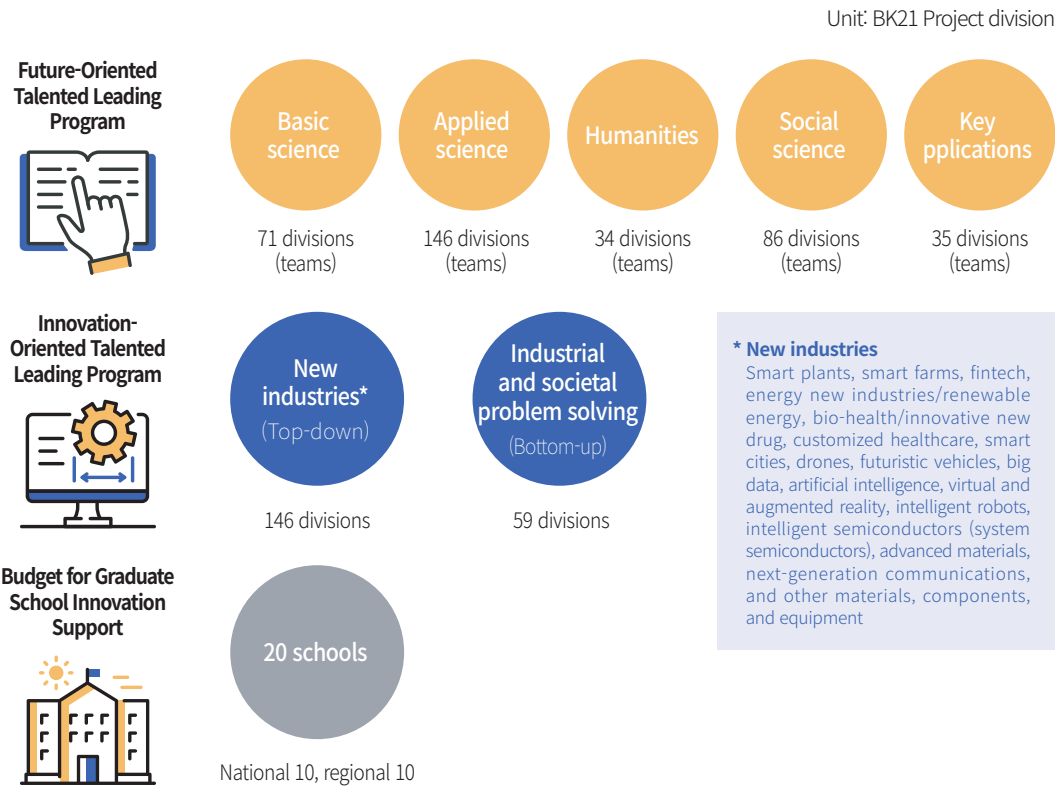
Current Status of Support by Program Type

	Future-Oriented Talented Leading Program	Innovation-Oriented Talented Leading Program
Talent development direction	To enhance research capabilities in key academic fields and foster academic future generations	To improve the competitiveness of new industries driving innovative growth, and foster talented researchers with combined expertise who will lead the way in industrial and societal problem solving
Support areas and selection criteria	<ul style="list-style-type: none"><li>By academic field (science &amp; technology and humanities and social science)</li><li>By BK21 Project Division &amp; Team</li><li>By national/regional level</li></ul>	<ul style="list-style-type: none"><li>By academic field (new industries, industrial and societal problem solving)</li><li>By national/regional level</li></ul>
Subjects for support (as of 2020)	373 BK21 Project Divisions (Teams) (197 divisions and 176 teams)	205 BK21 Project Divisions
Number of participating graduate students	About 12,600 students per year	About 6,400 students per year

	Support purpose	Support areas
Budget for Graduate School Innovation Support	Providing financial support to institutional reforms at the graduate school level while helping universities set the right course as research-oriented universities	Reshaping the university system toward a research-oriented university; improving the quality of graduate-school education, research environment, and the quality of research work; and raising the competitiveness of graduate schools on the global stage

※ The project budget is managed using a separate account opened within the university expenditure account.

Current Status of Support by Academic Area



Details of project budget usage

Not only providing support for fostering talented master's and doctoral-level individuals by granting research scholarships to graduate students and paying for the labor cost of young researchers, but also giving opportunities for them to actively engage in research activities and academic exchange using the Internationalization Budget and BK21 Project Division & Team Management Budget aimed at supporting their domestic and international academic activities

Classification (Allocation proportion)	Future-Oriented Talented Leading Program and Innovation-Oriented Talented Leading Program	Classification (Allocation proportion)	Graduate School Innovation Support Program
Research scholarships for graduate students <sup>1)</sup> (Over 50-60%)	Provided according to the standard amount specified for each academic degree program in accordance with the selection and payment criteria set by each BK21 Project Division (Team)	Labor cost (within 20%)	- Newly employed faculty, and employees dedicated to the program - Support personnel (technical staff, etc.)
Labor cost of young researchers	At least 3 million won per month provided to contract professors and postdoctoral researchers over a period of at least one year (contract period)	Internationalization budget	Expenses for exchange activities and costs for operating internationalization programs for graduate school internalization
Labor cost of industry-academic cooperation professionals	Provided according to the payment criteria set by each university over a period of at least one year (contract period)	Education and research program development budget (over 60%, including the internationalization budget)	- Costs for developing and operating programs to enhance the educational and research capabilities of graduate schools (not allowed to provide direct support to non-participating departments (colleges)) - Costs for developing and operating RA/TA programs and fellowship programs for graduate students (providing support to TA/RA graduate students involved in education and research activities under the BK21 Program) - Costs for enhancing the educational and research capabilities of academic future generations and newly employed faculty
Education program development budget	Educational materials development costs, case study costs, experimental costs, etc.	Educational & Research Environment Improvement budget (facility budget) (within 20%)	Costs for facility expansion to improve the educational and research environment for graduate students, including employment and startup support centers and common research space
Research & industry-university cooperation activities budget	Paper publication costs, domestic conference/seminar attendance costs, consumable material costs, expenses for industry-university cooperation activities, etc.	Operating/purchasing budget for research equipment	Costs for purchasing or renting general-purpose materials and equipment and research materials
Internationalization budget	Expenses for short- and long-term overseas training for graduate students and young researchers, costs for inviting foreign scholars, overseas patent application (registration) fees, etc.	Other project operation budget (within 5%)	Domestic travel expenses, book purchase costs, general utility expenses, and expenses for various events, etc.
BK21 Project Division & Team Management budget <sup>2)</sup> (within 10% or 50 million won)	Labor cost of BK21 Project Division staff, performance-based pay for participating professors, expenses for academic activities, domestic and overseas patent application & registration fees, expenses for hosting meetings and events, etc.		
Indirect cost <sup>2)</sup> (5%)	Expenses for general program management by the university (including the industry-academic cooperation foundation)		

1) Over 50-60% for each program type; at least 700,000 won for masters, at least 1 million won for Ph.D. candidates, and 1,300,000 won for PhDs  
2) Within 25% for the BK21 Project Division & Team Management budget and within 2% for the indirect cost in the case of universities that have been provided financial support for graduate student tuition fees from government agencies (KAIST, GDIST, DGIST, UNIST, etc.) (research scholarships for graduate students are not provided)



The National Research Foundation of Korea (NRF) has been rapidly advancing, along with great academic achievements. Going forward, the NRF will set the course for the country's basic research across all disciplines while always being committed to leading researchers toward future-oriented research.

## Introduction to BK21 Program Management Team

BK21 Program Management Team (NRF)

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