Requests from customers, and our efforts and plans to the requests

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Industries asked universities to foster talented persons having…

- Interdisciplinary knowledge
- Communication skill (English)
- Globalization and Networking
- Customized education
- Practice and experience
- Leadership
- Adaptation to multi cultures
- Dedication and Enthusiasm
- Marked individuality
- Morality and Responsibility
- Creativity

Value ?

Is our education system wrong?

President Obama's address in Mar. 10, 2009

"Now, even as we foster innovation in where our children are learning, let's also foster innovation in when our children are learning. We can no longer afford an academic calendar designed for when America was a nation of farmers who needed their children at home plowing the land at the end of each day. That calendar may have once made sense, but today it puts us at a competitive disadvantage. ***Our children spend over a month less in school than children in South Korea every year.*** *That's no way to prepare them for a 21st century economy. That's why I'm calling for us not unly to expand effective after-school programs, but to rethink the school day to incorporate more time – whether during the summer or through expanded-day programs for children who need it.*
Now, I know longer school days and school years are not wildly popular ideas. Not with Malia and Sasha– not in my family, and probably not in yours. But the challenges of a new century demand more time in the classroom. ***If they can do that in South Korea, we can do it right here in the United States of America."***

Our children spend over a month less in school than children in South Korea every year.

If they can do that in South Korea, we can do it right here in the United States of America.

Is their education system wrong?

My understanding…

The grass is greener on the other side of the fence.

Can every student or one system satisfy all demands from industries?

In order to adapt to our environment and to accept our customers demands, we have to innovate our education system.

How?

University provides multiple solutions.
Every student takes most preferable one.

Our examples

- Department of Electrical Engineering
  - Small innovation in a department
- Graduate School of Culture Technology
  - Interdisciplinary school
- Renaissance Ph.D. Program
  - Small innovation in a university
- KAIST Imagineering Institute (plan)
  - Large innovation in a university

Ex.1 Small Innovation in A Department

Academic Statistics

Faculty : As of Mar. 2010
Student : As of Oct. 2009

KAIST

KAIST		Electrical Engineering
553	Faculty	89 (16.1%)
9,661 BS 4,390 /MS 2,541 / Ph.D 2,730	Enrollment	1,323(14%) BS 517 / MS 365 / Ph.D 441
37,263 BS 9,807/MS 19,809/ Ph.D 7,647	Graduates	6,166 (16.5%) BS 1,917 /MS 2,925 / Ph.D 1,324
KRW 245.5 billion	2009 Research Fund	KRW 46 billion(18.7%)

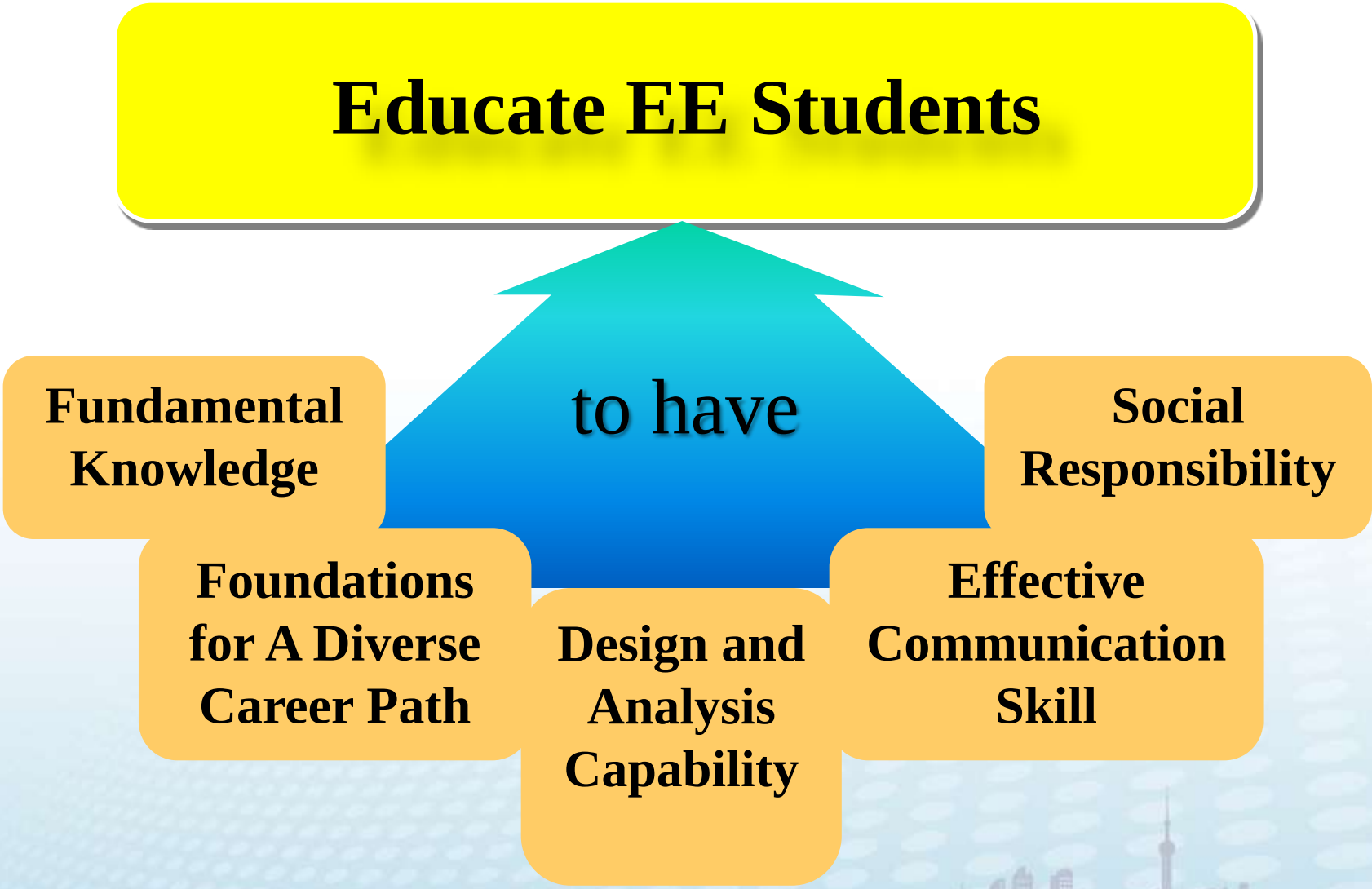
Mission Statements (Grad.)

Foster Global Leaders in the broad aspect of EE

with

- **Fundamental Knowledge**
- **Creativity**
- **Effective Communication**
- **Social Responsibility**

Mission Statements (Undergrad.)



Vision Statements

World-Leading EE Department

- fosters global leaders
- possesses world-class faculty and outstanding students
- provides break-through technologies for a better quality of life

-Foster Global Leaders in the broad aspect of EE

-Educate EE students for a diverse career path

Goals in 2025

Strengthen the global competitiveness in our current area.

Energy

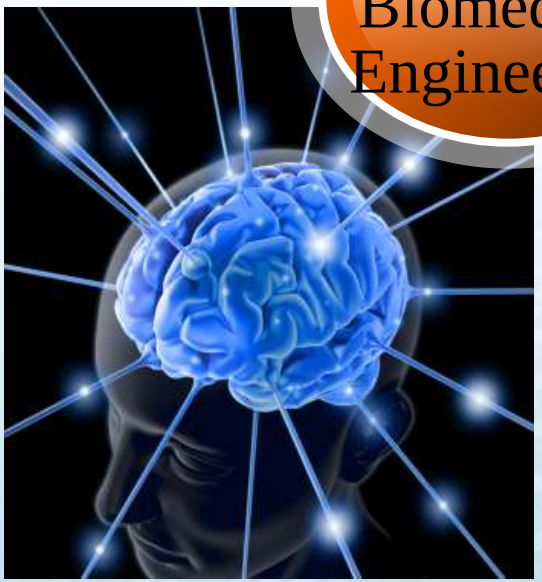
-Energy harvesting/transfer
-Green energy
-Smart grid network

Brain and Biomedical Engineering

New Areas

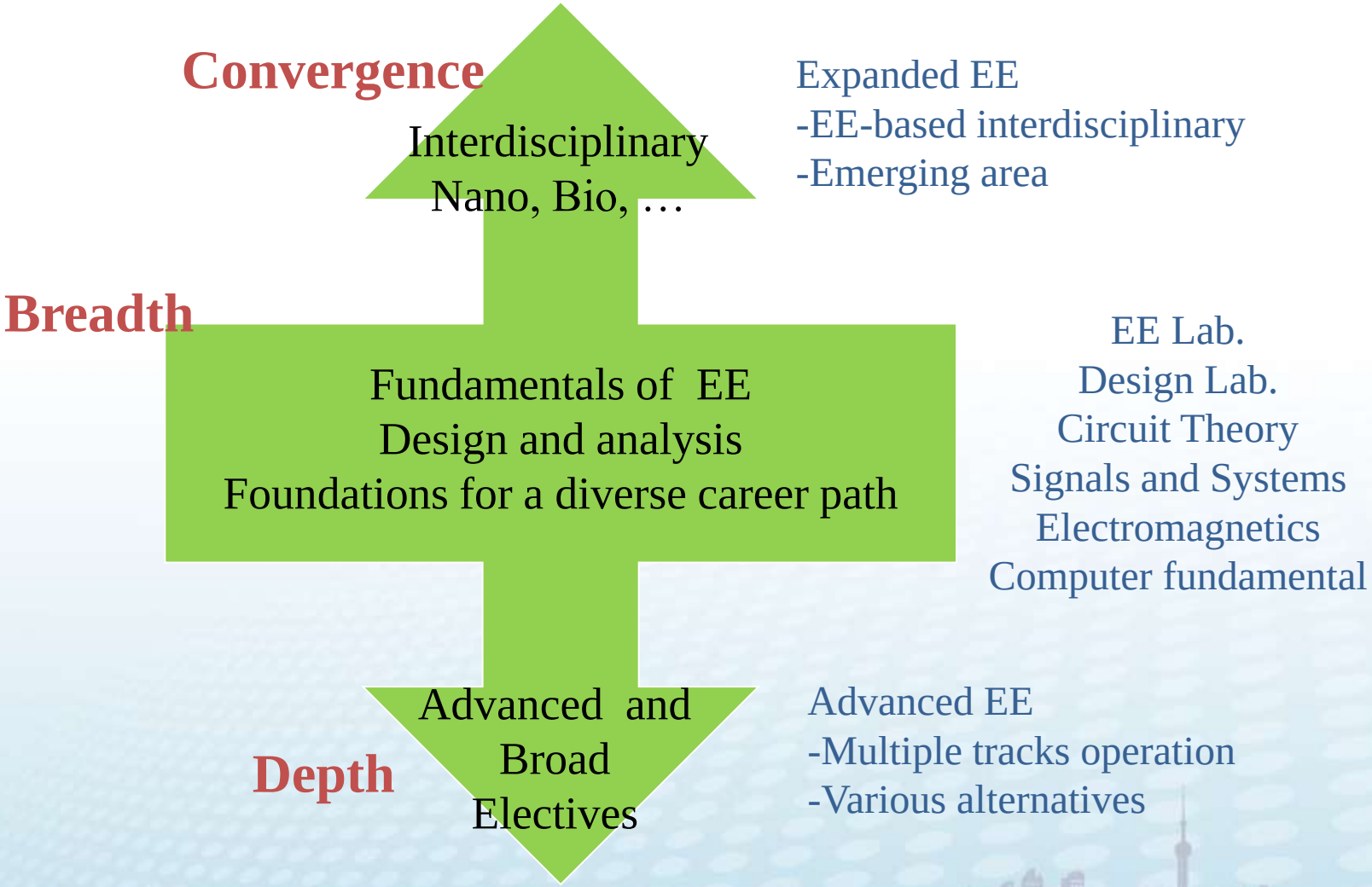
Network Computing

Environment



Action Plan: Education

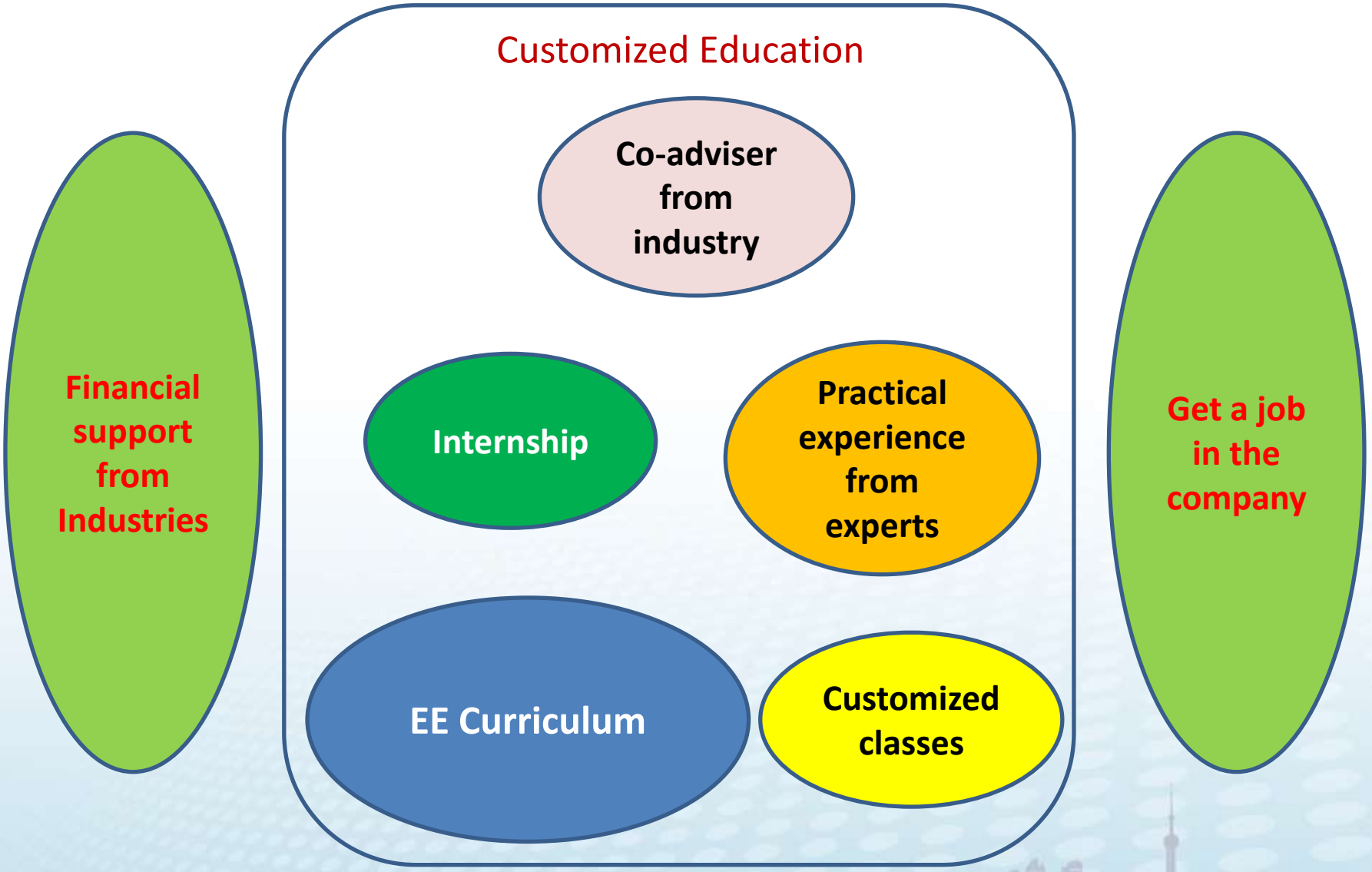
Curriculum (Undergrad.)



Action Plan: Globalization

- Foreign faculty
  - 5% → 20%
  - Recruit world-class senior faculty and promising junior faculty
- Foreign students
  - 3%(undergrad.), 3.5%(grad.) → 10-20%
  - From worldwide
  - Recruit excellent students
- Student internship
  - MicroSoft, Qualcomm, …
- Promotion of the international activity
  - Editorial, Committee, Invited talk, …
- Dual degree program
- External advisory committee

Customized MS and PhD Program



This was an example of innovation within a current department system.

Ex.2 Graduate School of Culture Technology

Characteristics of Culture Industry

- Culture industry
  - Produce, distribute and consume the cultural goods
  - Similar characteristics to the knowledge-based industry
- Globalization
  - Everywhere
- Digitization
  - Protection of IPR ?
- Convergence
  - Between culture/art and science/tech
  - Virtualization
- Ubiquity
  - Anytime, anyplace

GSCT Overview

Established in 2005

A graduate program

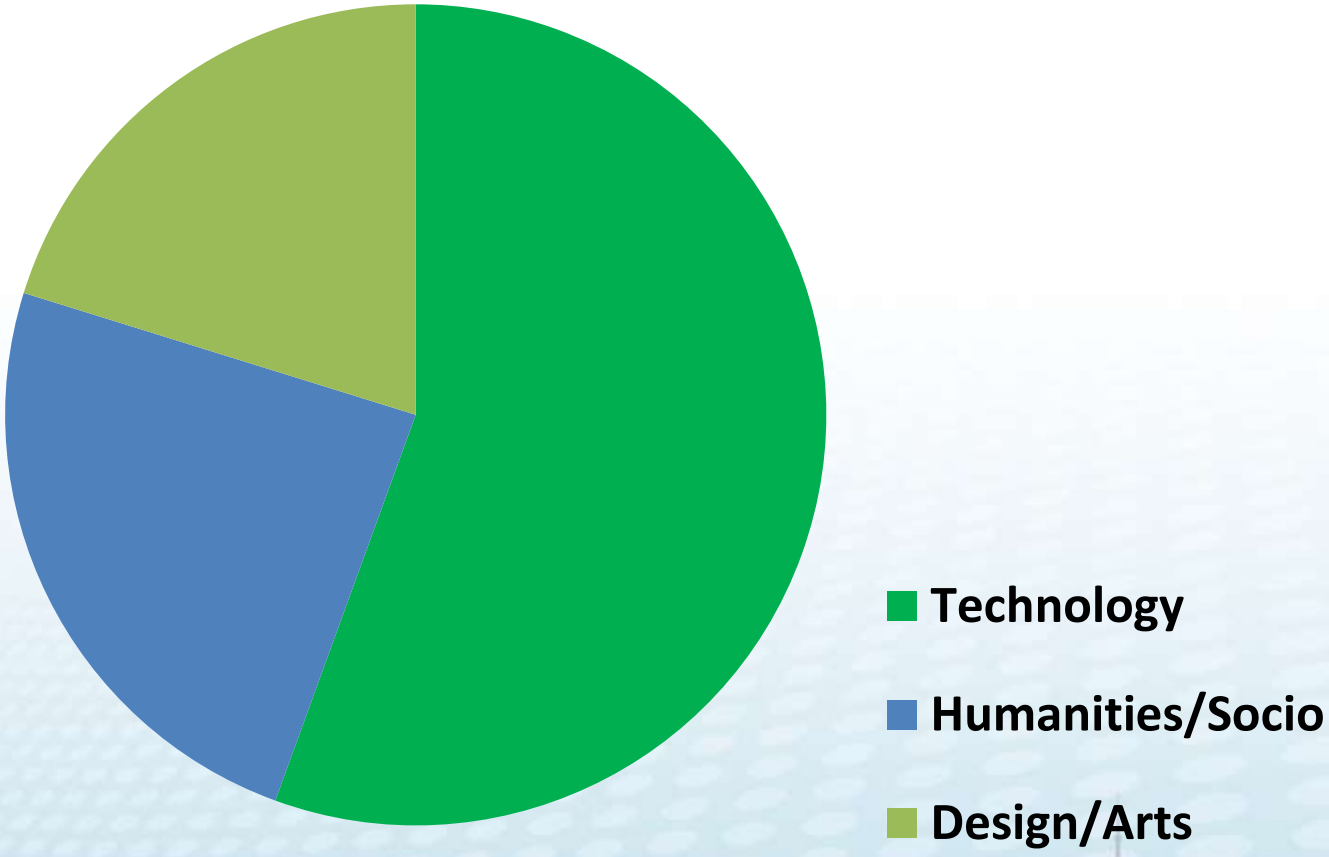
Fully supported by the Ministry of Culture

US $3M ~ 7M per year, over 10 years

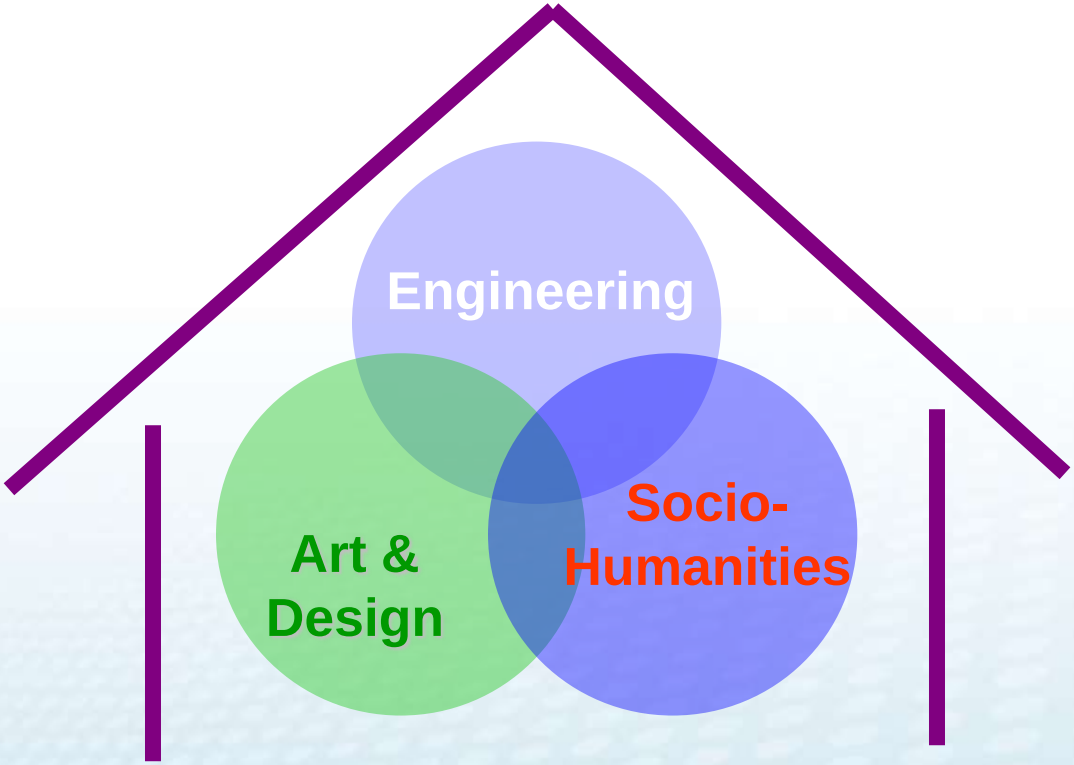
Mission

- Foster“Global leaders” for the culture industry
- Develop Technology for the culture industry
- A new kind of post-graduate education which fuses (digital) technology, socio-humanities, arts, and business

Students Backgrounds



Curriculum: Science, technology, and practice on 'culture' …



Curriculum: Electives

- Humanities and Social Sciences
  - Digital Aesthetics
  - Digital Heritage
- CG/VR
  - Computer Graphics
  - Advanced Computer Graphics
  - Digital Humans
- Music, Sound, and Performance
  - Theater music & design
  - Acoustic instrument design & evaluation
  - Planning & management for stage performances
  - Digital performance

Research Areas

- Computer graphics
  - Movies, TV
- Sound, Music & Performances
  - Sonification, Digital music, Digital performance
- Internet & Social Computing
  - Social media, Data-driven sociology, Internet contents
- Interactive media
  - Games, ubiquitous services, VR
- Digital heritage
  - Acquisition, restoration, and exploitation of cultural/natural heritage
- Design
  - Computational Design, Digital Architecture, Digital Fashion
- Cultural management
  - Internet contents and services

This was an example of
a new interdisciplinary program.

Ex.3 Small Innovation in A University


Renaissance Program

Goal of the Program

The Renaissance Program should help to promote innovation in performing a system project whether the project is inter-disciplinary project or domain-specific project when the project deals with a system for design and/or realization, thus training the involved students to have integrated system engineering and design capability.

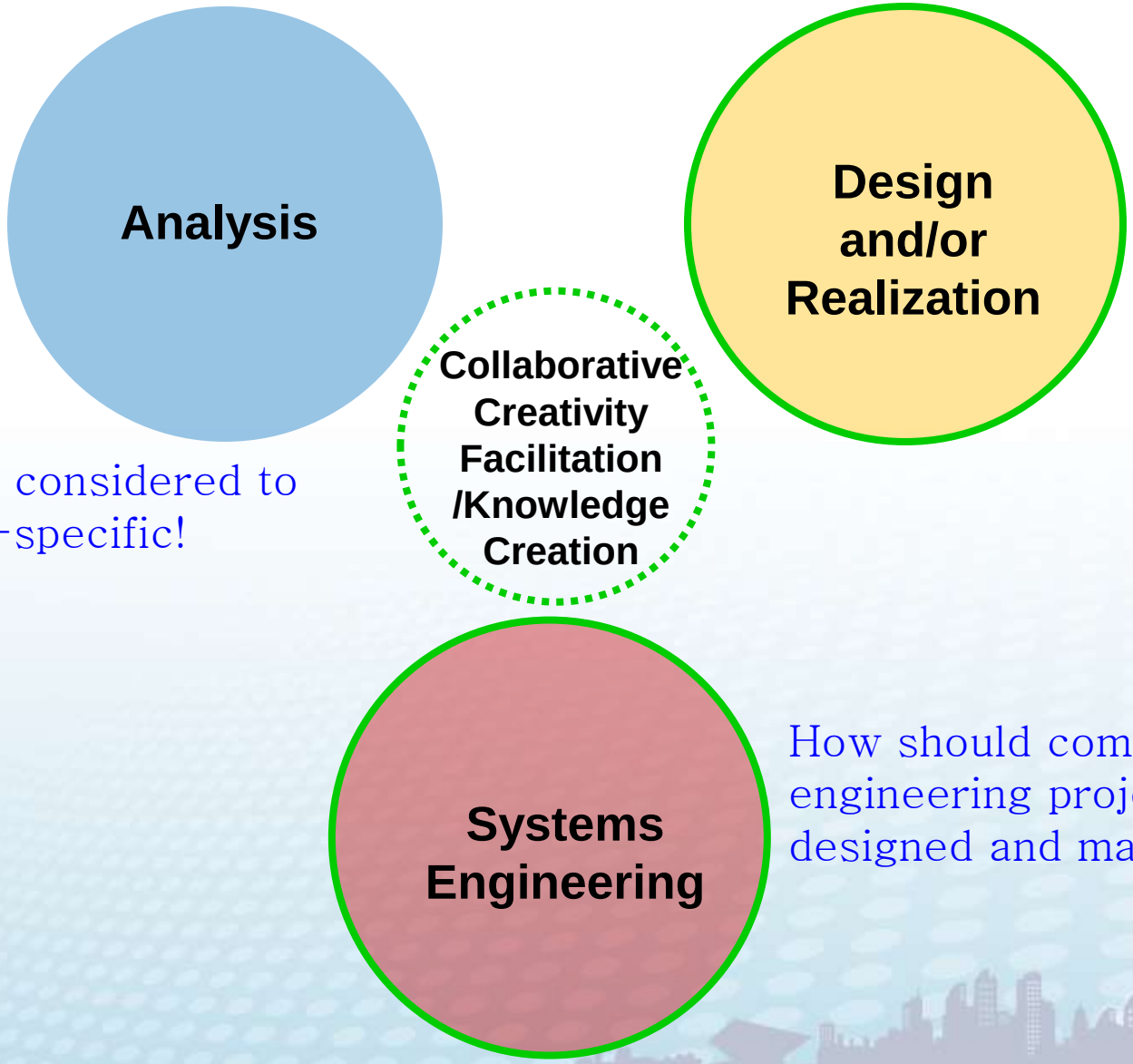
Rationale of the Program

- In the age of fusion technologies today, it has become difficult to provide effective solutions to real-world complex problems only with analytic thinking.

- It is now necessary to provide education in systems thinking that creatively leads to collaboration between various fields as viewing on the whole, besides analytic thinking to meet contemporary needs of our society.

- In order to educate a leader with integral research ability that is based on the collaboration of diverse fields, it becomes essential to have systematic education that encourages integral thinking as well as design ability through realization of creative collaboration and practical system design.

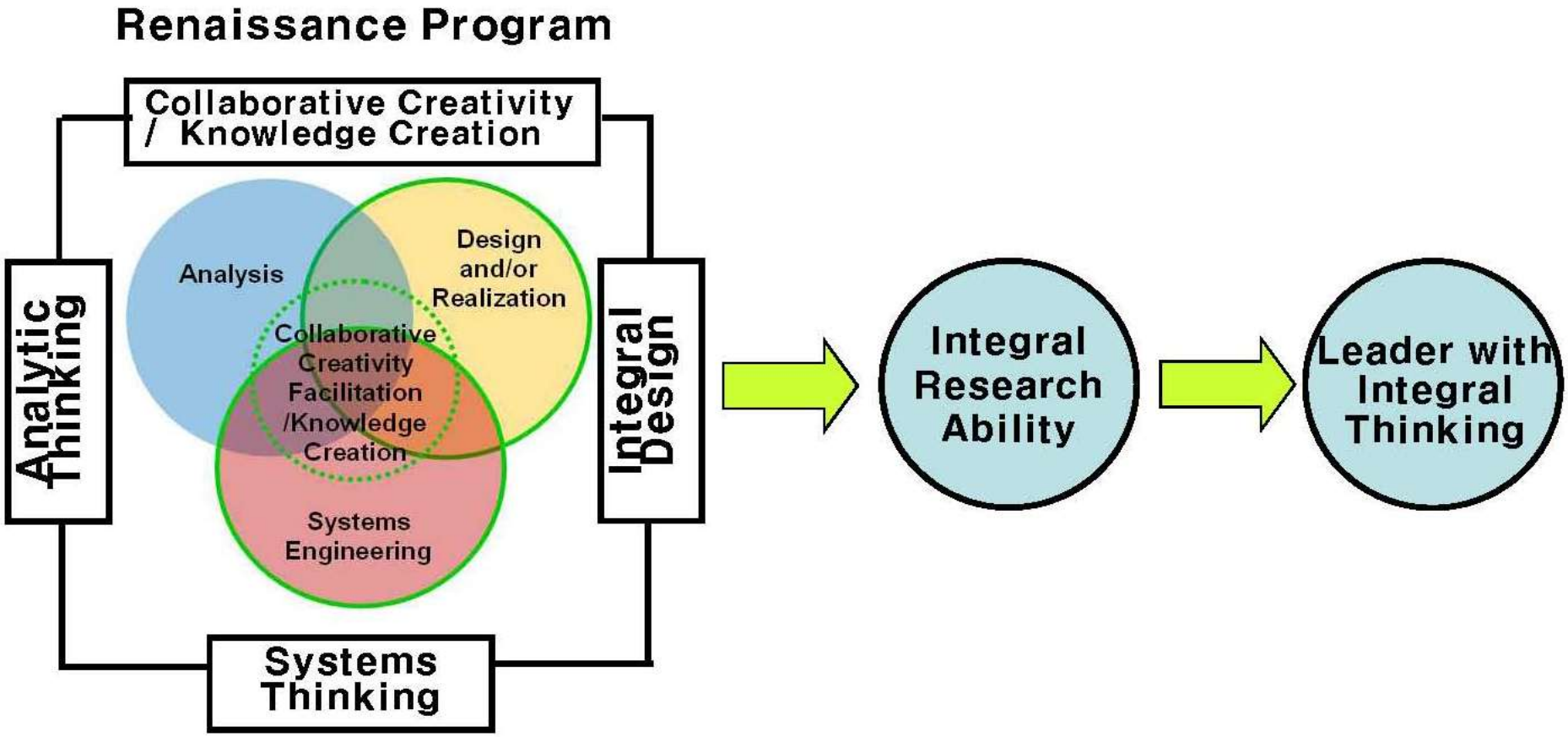
Role of Collaborative System Design



Analysis is considered to be domain-specific!

How should complex engineering projects be designed and managed?

Renaissance Program as a System and its Goal



Course Structure of Renaissance Program

- 1st Semester: Core course : Collaborative System Design
- 2nd Semester: Departmental system design course : Eg. Design of Complex Mechanical Systems in Mechanical Engineering
- 3rd Semester: Departmental Design Project 1
- 4th Semester: Departmental Design Project 2

The other courses are same as normal Integrated MS-PhD Program in his/her department.

This was an example of innovation within a university system.

Ex.4 Large Innovation

KAIST

Imagineering

Institute

Letting your Imagination soar,
and then Engineering it down to earth. by Alcoa in 1942

"Imagineering!!!"

Makes students design by tehemselves

Combines IT and other fields

Stimulates imagination

Whom do we foster?

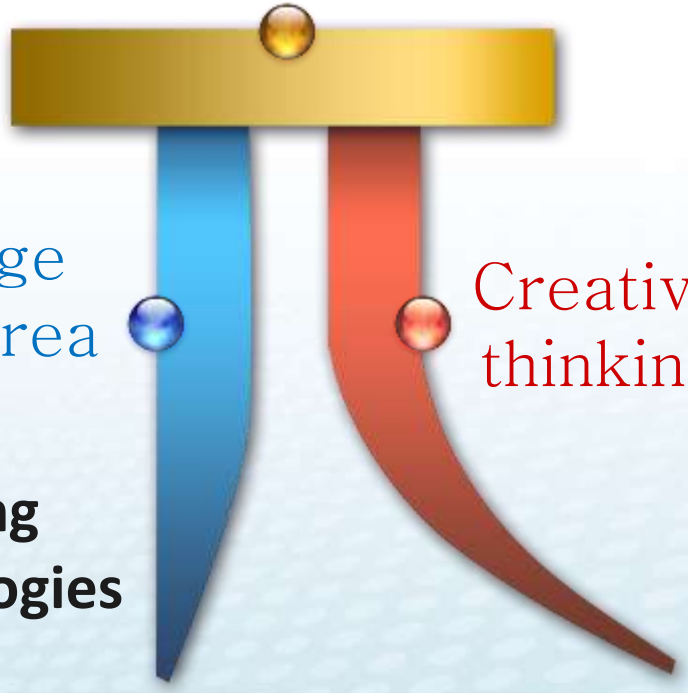
"Through convergence of IT and other fields"

1. **Talented to have abilities to develop core technology becoming a base of new growth engines in the future.**
2. **Talented to have abilities to be a architect in global IT companies.**
3. **Talented to pioneer a new field and to generate global network as a leader.**

Special Features

Based on a broad field

Ready to Convergence



Knowledge
in major area

Creative
thinking

Depth of specialty capable of developing new or core technologies

Entrepreneur spirit and flexibility

KI² Curriculum

Advanced Course

Problem-oriented
interdisciplinary research activity

Concentration Course

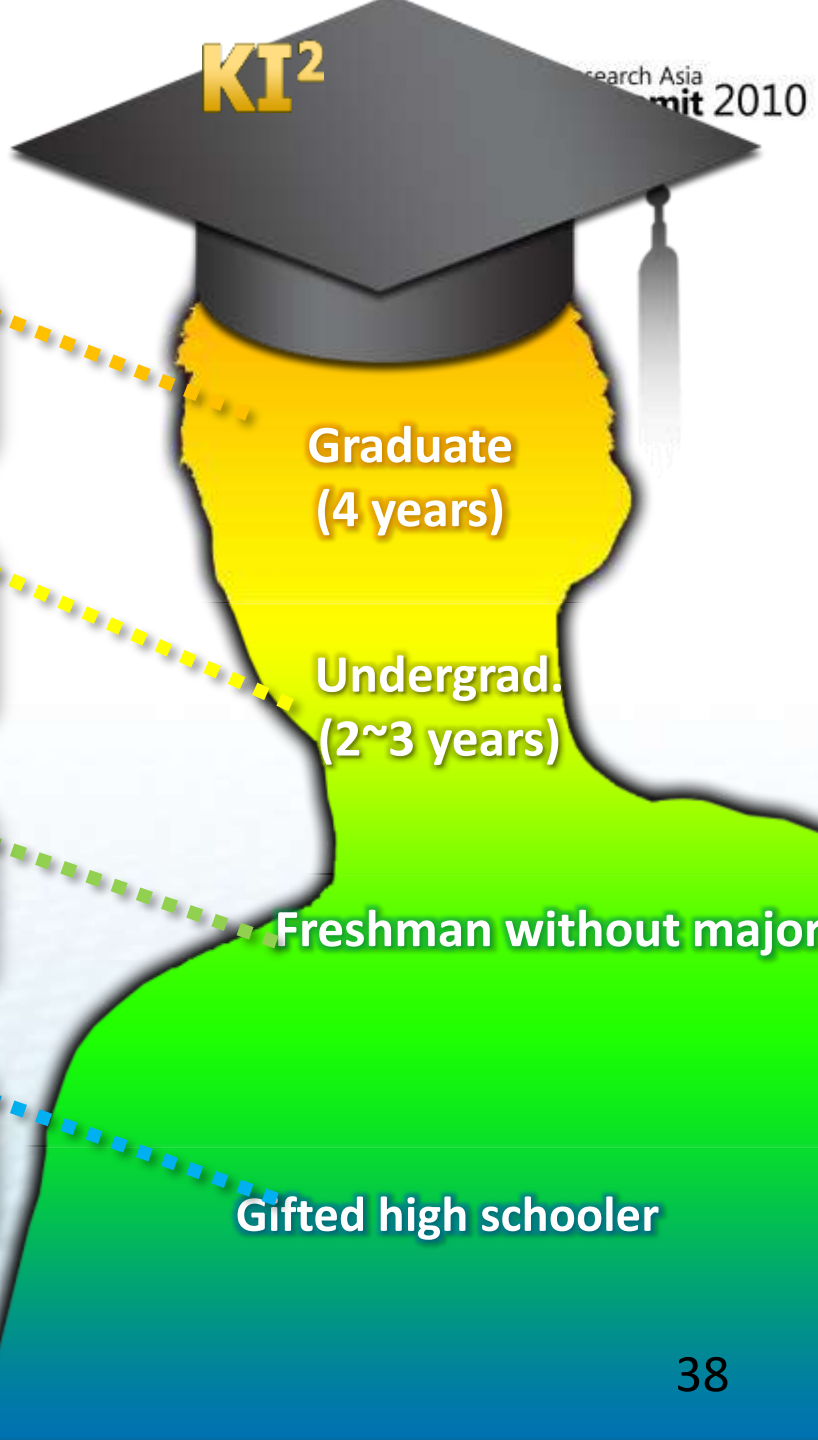
Principle-oriented discipline
Interdisciplinary knowledge for convergence

Foundation Course

Landscape expedition
Flexible thinking and planning for learning

Pre-undergrad course

Basic knowledge in IT
Rapid training of basic studies



KI² Curriculum

Elective Courses
- Freely take other department classes
- Internship, volunteer activities

Teamwork Program
- Cultivating a flexible way of thinking
- Communication skills

Peer Teaching
- Self learning
- Mentoring

Undergrad. Research Program
- Participate in research activities

This was an example of
a new education system.

How can we harmonize these multi-functional programs and various innovations in a department or an institute?

The most important skill to acquire is learning how to learn. by John Naisbitt

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