

Rock Mech. Lab, Hokkaido Univ., JAPAN

Improvement of an Engineering Education Program in Hokkaido University, Japan

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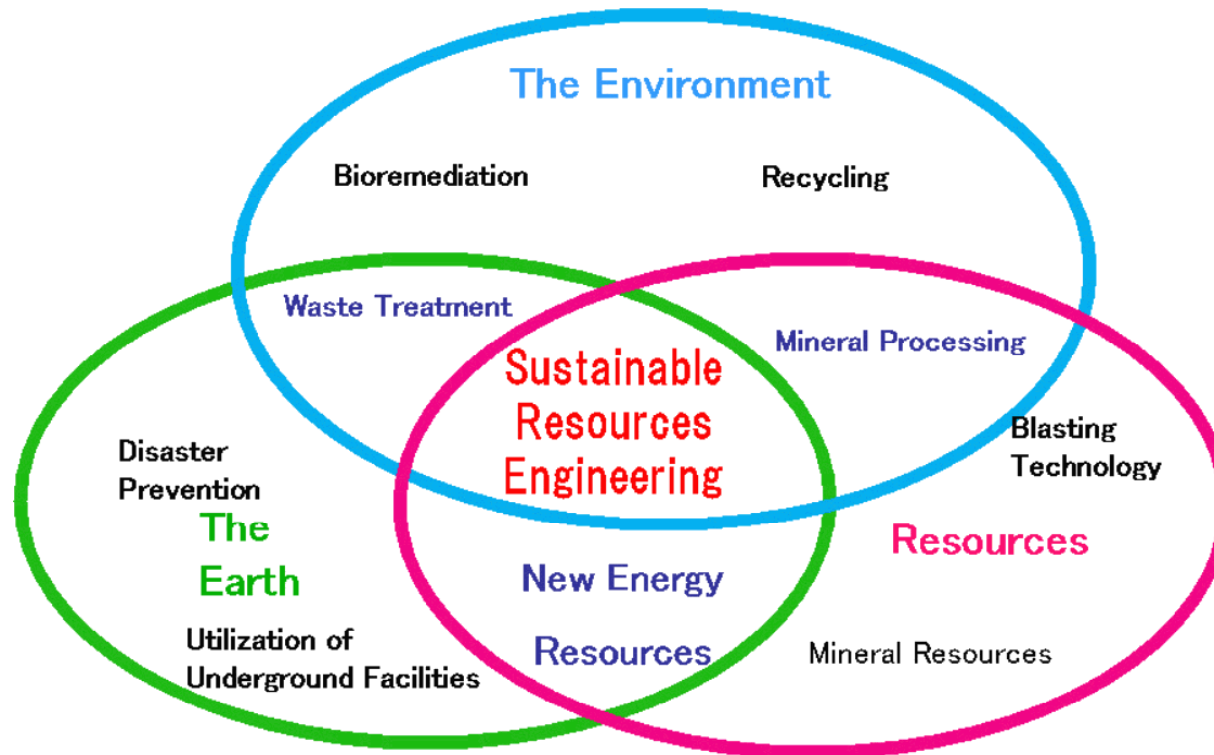
Content

- History of the program
- Program in the past
- Efforts to improve the program
 - Committees
 - JABEE
- Program at present
- Education for Engineering Design Ability
- Outcomes assessment

History of the program

- Department of Mining was established in 1925
- Renamed to Department of Mineral Resources Development Engineering in 1972
- Accredited by JABEE in 2003.
- Renamed to Course of Sustainable Resources Engineering in 2005

Sustainable Resources Engineering?



From Course Web Site

The program in the past

- Number of coal mines decreased
- We were teaching Mining Engineering
- Society and students did not need Mining Engineering.
 - This was apparently shortsighted. Now we desperately need mining engineers. MEXT and METI are using huge budget to raise mining engineers to secure energy and mineral resources.

- Students in Faculty of Engineering should choose one of the departments in the second grade.
- Students with low GPA were reluctantly assigned to our program.
- Both students and teachers with no enthusiasm.
- A few students came to the classes.
- Most of them fell asleep.

Efforts

- Curriculum Pettit Committee
- Committee for Education System Improvement

Curriculum Pettit Committee

- Purpose was to improve curriculum
- Members were not designated but most young teachers voluntarily attended.
- Old professors did not attend.

■ Recognition of the current state.

- Most students had not wanted to come to the program.
- Students and teachers were both disappointed.
- Classes with no "hot" atmosphere.
- Negative images were handed down to the next students.
- Number of students who wished to come to the program decreased.

- Establishment of key words for the program future
 - The Earth
 - Resources
 - The Environment

■ Tactics

- Increase number of students who wish to come to the program.
- Improve the curriculum and classes so that motivated students can be satisfied.

- Increase of student number who wish to come to the program
 - Maximum efforts to the omnibus class "Introduction to Socio-Environmental Engineering II", which is for freshmen, by all Profs in the program.
 - Resources: Presents from the Earth
 - Technology of a Shield and a Pike
 - Human and Underground Resources
 - Introduction to Environmental Geology
 - Flow, This and That
 - Recycle Concrete Also
 - Welcome to the Powder Wonderland!

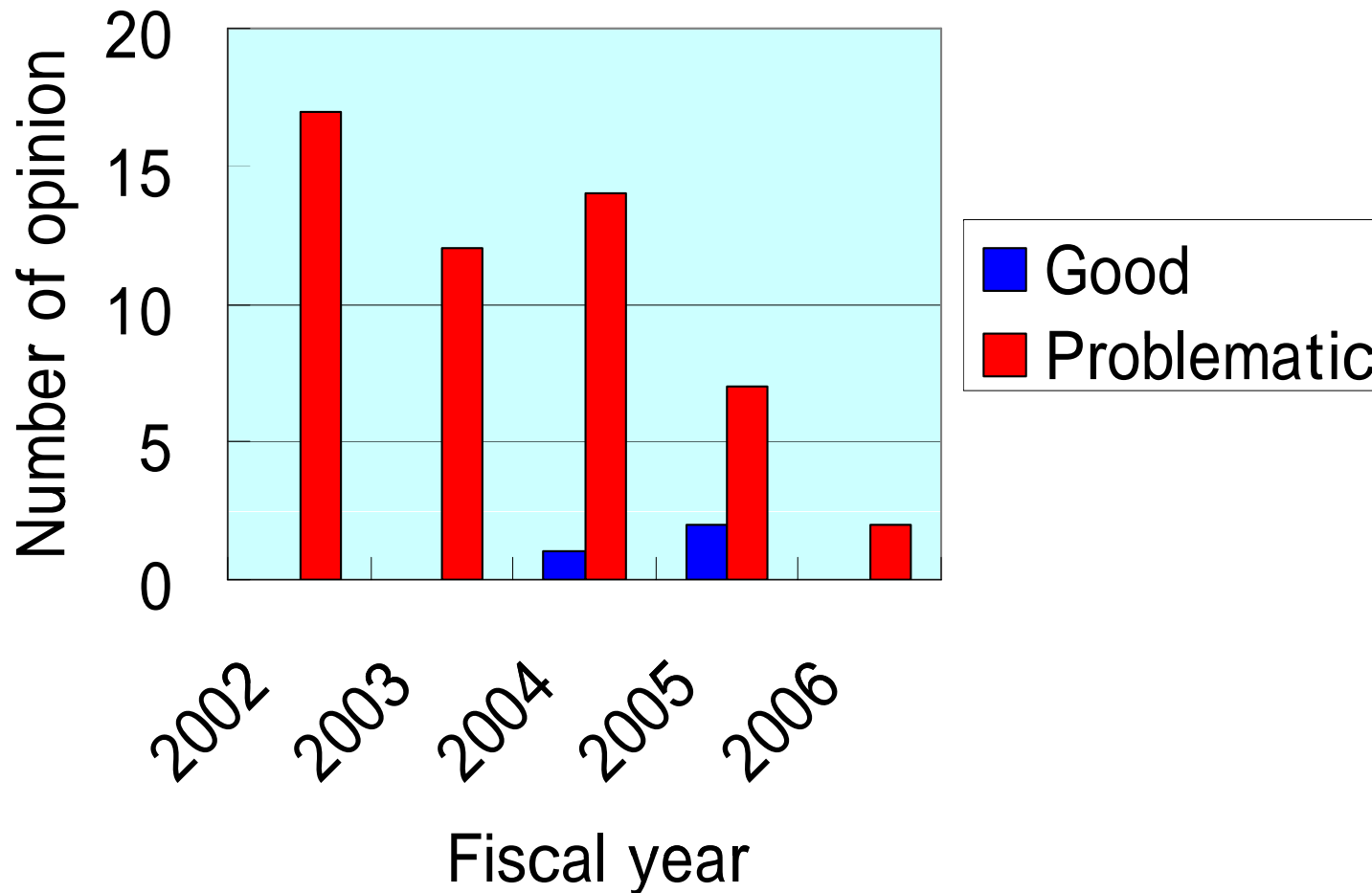
- Improvement of the curriculum and courses so that motivated students can be satisfied.
 - Up-to date
 - More basic and wide
 - Course title change
 - Ex. "Mineralogy and Petrography" to "Earth Sciences"
 - New courses which related recycling and environments
 - Reopening of "Internship"

Committee for Education System Improvement

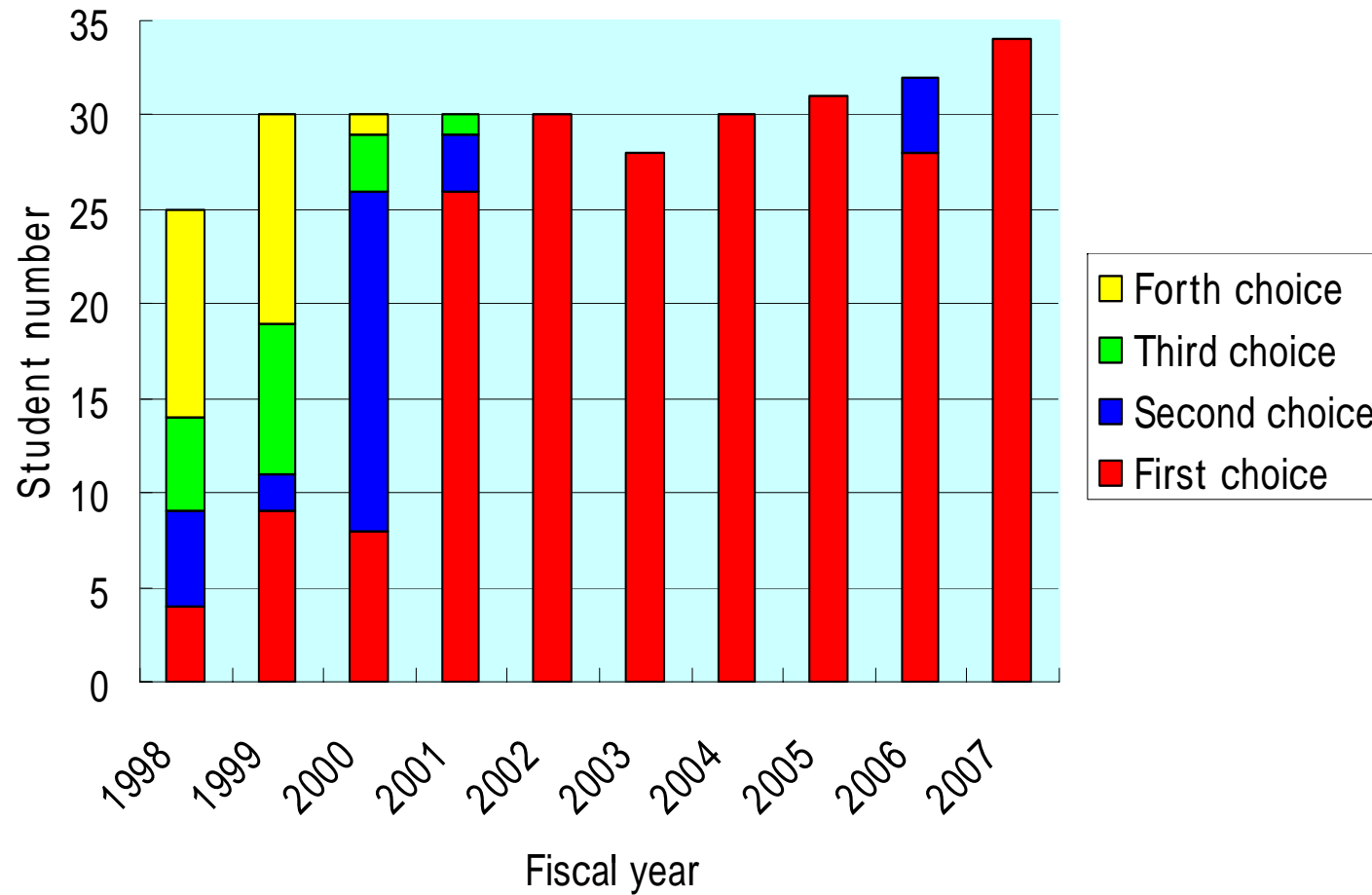
- Originally established for JABEE preparation
 - Continuous education improvement
- Implementation of questionnaire for every semester
 - Education policy
 - Course evaluation

- Analysis of questionnaire results
 - Commendation of "Teacher of the Year"
 - Proposal of solution for "bad courses" to the program meeting

Example of evaluation of a course



Students' choice



Program at present

- Full of motivated students.
- Hot classes by enthusiastic teachers.
- Friendly and warm atmosphere.



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Education for Engineering Design Ability

- Various elective courses
- Graduation research
 - 8 credits
 - One year during the fourth grade
 - We let students carry out original research
 - Should be more than 450 hrs

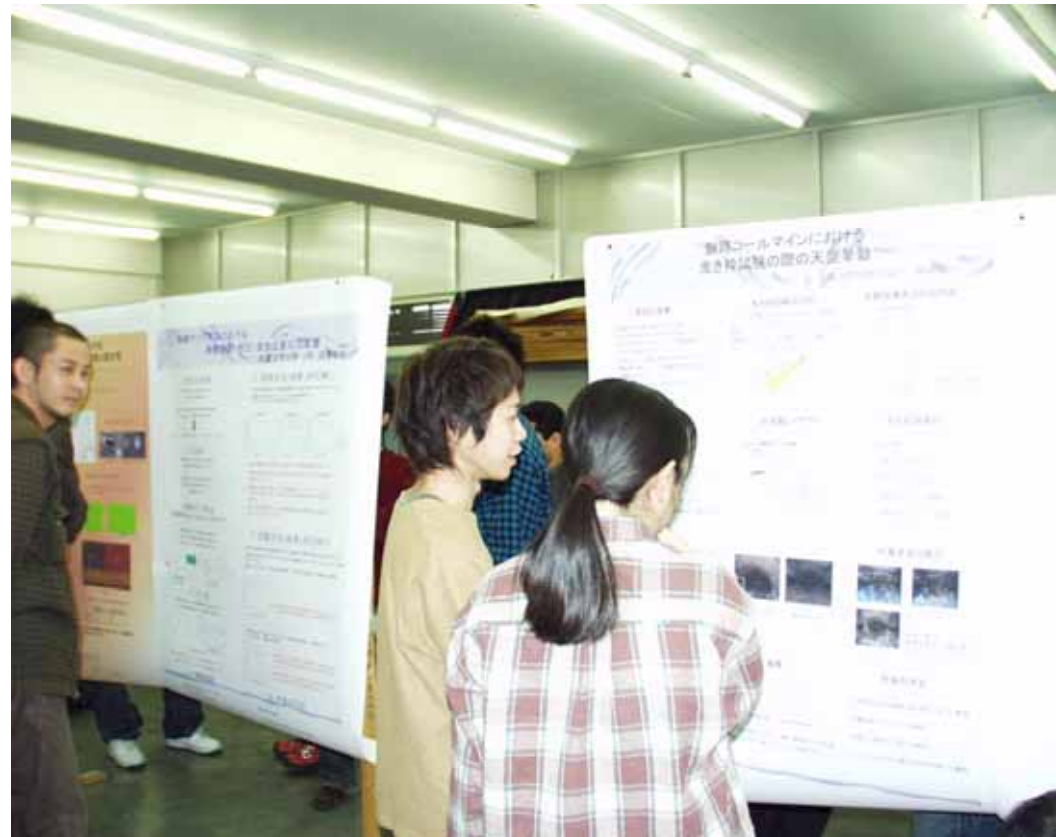
Outcomes assessment

- Exam for each course
- English accomplishment is partly evaluated by TOEFL.
- Graduation research
 - Thesis
 - Poster session
 - Interim defense
 - Final presentation
 - Final defense

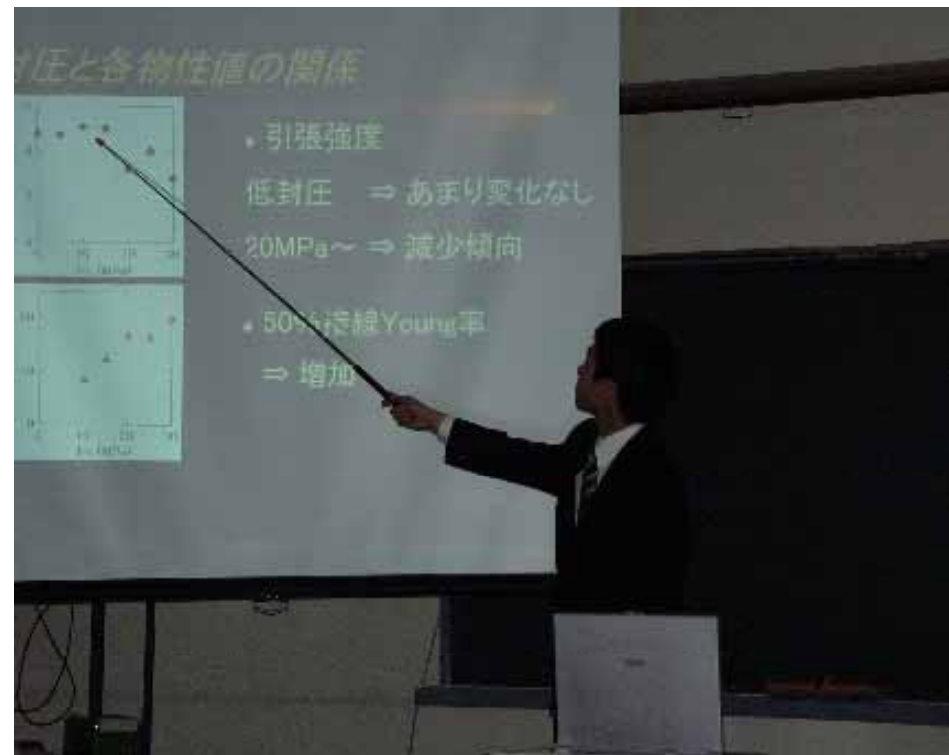
- Thesis (by supervisor)
 - Adequate title and structure
 - Objectives and backgrounds are shown
 - Contents are clearly shown
 - Discussions based on results are shown
 - Results are briefly summarized
 - Terms and grammar are adequate and sentences are logical
 - Figures and tables are adequate.
 - Abstract in English is attached.
 - Adequate references are shown.

- Poster session (by the program meeting)

- Adequate format
- Objectives, methods, themes, etc. are shown.



- Presentation (by more than three teachers)
 - Presentation skills
 - Understanding of questions and appropriateness of answers



- Research process (by supervisor)
 - Understanding of the theme
 - Planning and performance
 - Eagerness

Concluding remarks

- Education program can be improved.
- One of the good way is to be accredited.
 - Preparation for accreditation is sometimes more useful for improvement than accreditation itself.
- Efforts for high quality education don't obstruct but enhance research activities.
 - Good education
 - Good students
 - Good research
- We mostly counts on graduation research for education of design ability .
 - However, the program uses not only graduation research but also exercises and experiments for design ability education.
 - The program is making efforts to make graduation researches as productive as possible.

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謝謝！

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