Program Outcomes and Assessment: Criteria and Practice in Korea

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ABEEK

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Objectives of Accreditation in Korea

- To assure that graduates meet or exceed minimum quality → QA
- To ensure that programs continually improve the quality of educational delivery → CQI

Reflected in Our Accreditation Criteria

Accreditation Criteria (KEC2000)

1. Students
2. Program Educational Objectives
3. Program Outcomes and Assessment
4. Professional Components
5. Faculty
6. Facilities and Funds
7. Program Criteria

Characteristics of ABEEK Criteria

Seek,

- Outcomes Based Education
- Demand Driven Education
- Self Improvement Circular System

Input, Output, Outcomes?

Output

BS in Computer Engineering

Input

Curriculum

Outcomes?

Criterion 3. Program Outcomes and Assessments

Accredited program should demonstrate their graduates have the following knowledge and capabilities. Each Program should have an assessment process with documented results. The results should take account of the need for continual improvement of the program.

a. An ability to apply the knowledge of mathematics, science, and engineering science

b. An ability to design and conduct experiments, as well as to analyze and interpret data

c. An ability to design a system, component, or process to meet desired needs

d. An ability to function in multi-disciplinary teams

e. An ability to identify, formulate, and solve engineering problems

f. An understanding of professional and ethical responsibilities

g. An ability to communicate effectively

h. A broad education which is necessary to understand the impact of engineering solutions in a global and societal context

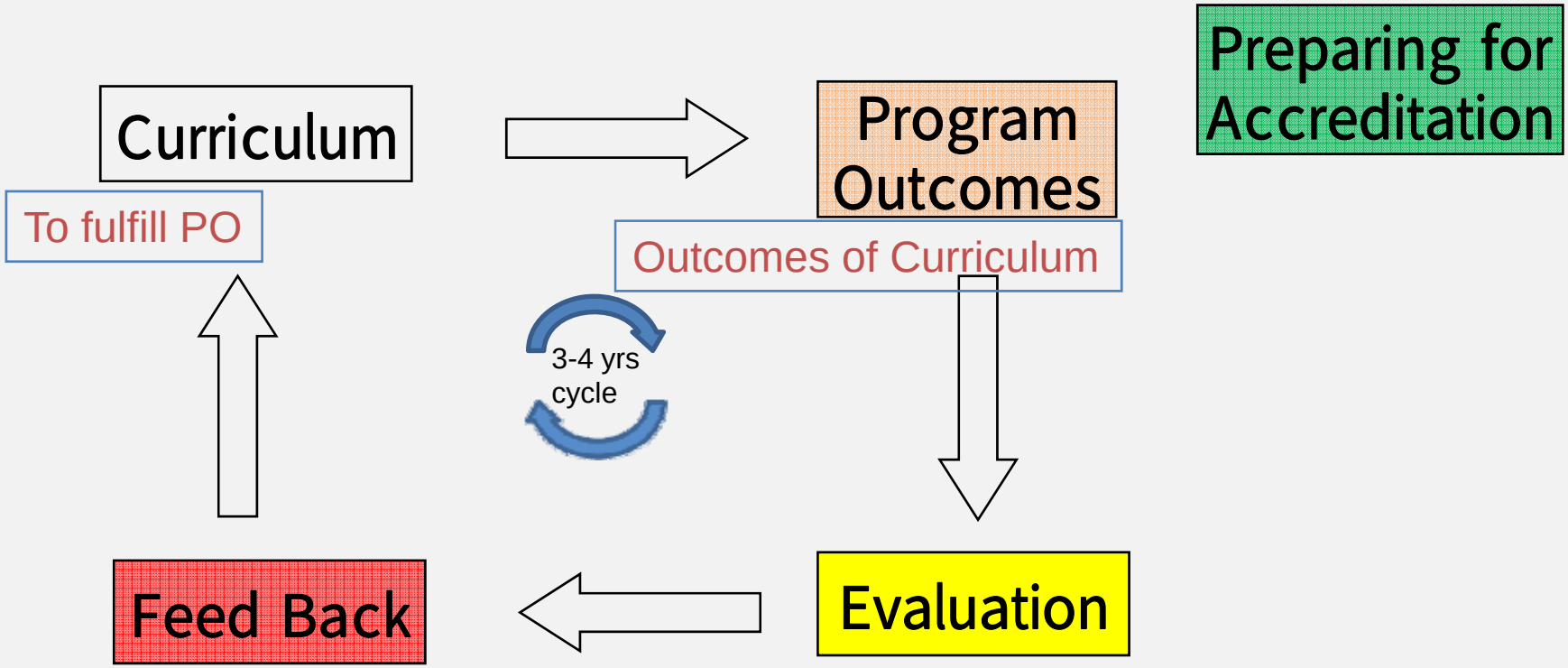
i. Recognition of the needs, and an ability to engage in life-long learning

j. Knowledge of contemporary issues in the society, economy, environment, and law.

k. An ability to understand other cultures and engage in international collaboration

l. An ability to use up-to-date techniques, skills, and modern engineering tools required of engineering professionals

Construction of Engineering Educational Program



Phase 1 Implement
- Coursework
- Student Activities (Consulting, Extra-Curri, et c.)

Phase 2 Assessment
- Measure PO Assessment System (Committee, Tool, Data storage)

Phase 3 Compare & Analysis
- Data Analysis
- Compare In & Out
- Recommendations

Phase 4 Improvement
- Curriculum Change
- Educational Environment
- Facilities & Funds

Phase 5
- Documentation
- System

What we have to do for each phase?

Phase 1: Implementation

Show that the curriculum is appropriate and effectiveness

Phase 2: Assessment

What are the subjects(criteria)?
What are the assessment tools?
What are the data? How to collect them?

Phase 3: Evaluation(assessment results)

Summary of data
What are the recommendations from the analysis?

Phase 4:Feedback of Results

How to use the recommendations for Program Improvement?
Where are the “proofs”?

Phase 5: Accreditation Preparation

Documentation for accreditation review

Phase 1: PEOs, POs vs. Curriculum

◎:strong correlation
○:some correlation

		Course 01	Course 02	Course 03	Course--	Course 20
PEO 1	PO1 PO2	◎ ◎	○	○ ◎	◎ ◎ ◎	◎
PEO 2	PO3 -- PO8	◎	◎ ○	◎	○ ◎ ○	◎ ◎
PEO 3	PO9 PO10			◎	○	
PEO 4	PO11 PO12	◎	◎	◎	◎ ◎	◎

Curriculum should be set up to fulfill PEOs and POs.

Curriculum consists of coursework and student's extra activities.

Hierarchy of coursework should satisfy that each PO is achieved

Construct self improvement circular system for QA and CQI

Phase 2: POs vs. Assessment Tools

	Ass. Tool 01	Ass. Tool 02	Ass. Tool 03	Ass. Tool 04
PO 01		○		○
PO 02	○			○
PO 03 … PO 11			○ ○	
PO 12	○	○		

Assessment tools should be designated for each PO.

Balance direct and indirect methods of measuring each PO.

Identify the system for QA or CQI.

The end results of the assessments should be quantitative.

Essential in “Program Outcomes and Assessment “ : Assessment Tools

Tools:

- Surveys(Graduates, Employers, Faculty etc.)
- Student Portfolio
- Focus group
- External Examiner
- Certified testing and evaluation
- EXIT INTERVIEWS and EXAMINATIONS
- Graduate career paths

What the tools should be

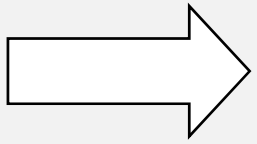
- How could the qualitative terms such as “Team Work” be measured quantitatively?
  - Example: English Ability vs. TOEFL score
- How could the tools measure the effectiveness of the whole curriculum? (Exit Outcomes)
- How could the tools measure the outcomes-based students’ ability?
- Is the given assessment system for QA or CQI?

The Tools for Team work

- Surveys(Graduates, Employer, Faculty et c.)
- Results of coursework such as Capstone Design, E
- S
- Exit Interview
- Internship Reports

Is it possible to measure POs quantitatively by just coming up with proper assessment tools ?

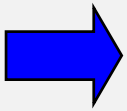
A quantitative measurement system for each assessment tool is needed.



Rubrics

Rubrics?

Measure POs Quantitatively



Rubrics
Construction and Publicity

Type of Rubrics

Holistic Rubrics: set up an overall measurement system for all attributes combined

Detailed(Analytic) Rubrics: set up a separate measurement system for each component attribute

An Example: Holistic Rubrics

For 'measuring' the quality of a written report

4	Content and readability are excellent. Grammar, punctuation, usage are error-free. Style is adequate for expressing one's thoughts and ideas effectively.
3	Content and readability are adequate. Grammar, punctuation, usage are error-free. But style needs to be improved for greater overall effectiveness.
2	The writing quality is barely acceptable. Grammar, punctuation, usage are almost error-free but content and readability is marginally acceptable.
1	The writing quality is unacceptable for a college student. Almost unintelligible.

From: Dannelle D. Stevens & Antonia J.Levi(2005). Introduction to Rubrics. Stylus Publishing LLC

An Example: Analytic Rubrics

For 'measuring' the conducting of an experiment					
	Preparation	Execution	Reporting	Data analysis	Team work
5	Adequate planning and preparation before experiment	All steps executed smoothly for excellent overall effectiveness	Report satisfactory with coherent presentation of facts and observations	Can link data and underlying physics, and unusually adept at creatively utilizing one's knowledge and experience	Shows flexibility and leadership to achieve greater team effectiveness
4	Acceptable planning and preparation before experiment	All steps executed well	Report adequate with no grammar and punctuation error but lacks coherent observations	Can link data and underlying physics, and articulate conclusions by utilizing one's knowledge	Shows flexibility as a team member and shares responsibility for effective team work
3	Sporadic and uneven planning and preparedness	Mixed results due to inadequate preparation and planning	Report comprehensible but contain some grammar and punctuation errors	Can link data with underlying physics	Cooperates with others but not very effective
2	Understands basic methodology and need for planning and preparation	Some steps executed but ineffective	Report intelligible with some effort on the part of the reader	Understands link between data and underlying physics but no effective conclusions can be drawn	Engages in some cooperation but prefers working alone
1	Almost no planning or preparation	Require extensive and continual help from TA or peers	Report of unacceptable quality	Either incapable or unwilling to relate results with reality	Cannot work as a team member

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且夫水之積也不厚 則其負大舟也無力.
風之積也不厚 則其負大翼也無力也.

-逍遙遊, 莊子-