

IEEE Engineering Accreditation Workshop

Nov.6-8, 2004, Bangkok, Thailand

Accreditation in IEEE Region 10

3:30PM-5:00PM, Nov.7

An overview of existing and developing accreditation systems in Japan

Dr. and Prof. Shoji SHINODA, IEEE Fellow, IEICE Fellow

**Department of Electrical, Electronic and Communication Engineering
Chuo University, Tokyo
shinoda@ieee.org**

Member of the Executive Committee as well as of the Coordinating Committee of Examination and Accreditation of the Japan Accreditation Board for Engineering Education (JABEE)

**Chair of the Accreditation Policy Council (APC), Director of Publications, and Chair of the History-of-Technology Committee of the Institute of Electronic, Information and Communication Engineers (IEICE), Tokyo
shinoda@m.ieice.org**

The Japan Accreditation Board for Engineering Education (JABEE) , founded on November 19, 1999,

is an ABET-like **non-governmental organization** of

- ✓ **examining the validity of educational programs as the JABEE accreditation,**
- ✓ **accrediting the programs which satisfy the JABEE accreditation criteria,**
- ✓ **announcing the names of accredited programs to the public,**
- ✓ **re-examining the program for continuous accreditation within the year that follows the final year of the term of validity, and**
- ✓ **promoting quality and innovation in education worldwide.**

by evaluating whether or not the program satisfies the accreditation criteria, **with examination of the self-inspection report** filled by the applicant as well as **with on-site examination for 2 to 3 days.**

JABEE has accredited 102 engineering educational programs, since 2001.

2001: 3 programs for 3 institutions;

2002: 32 programs for 23 institutions;

2003: 67 programs for 47 institutions.

(61 institutions in total since 2001)

JABEE Accreditation Criteria:

Criterion 1: Establishment and Disclosure of Learning and Educational Objectives

Criterion 2: Qualitative Curriculum Requirements

Criterion 3: Educational Methods

3.1 Admission and Enrollment

3.2 Educational Methods

3.3 Educational Organization

Criterion 4: Educational Environment

4.1 Facilities and Equipment

4.2 Financial Resources

4.3 Student Support System

Criterion 5: Evaluation of Students' Level of Achievement against the Learning and Educational Objectives

Criterion 6: Educational Improvement

6.1 Educational Feedback System

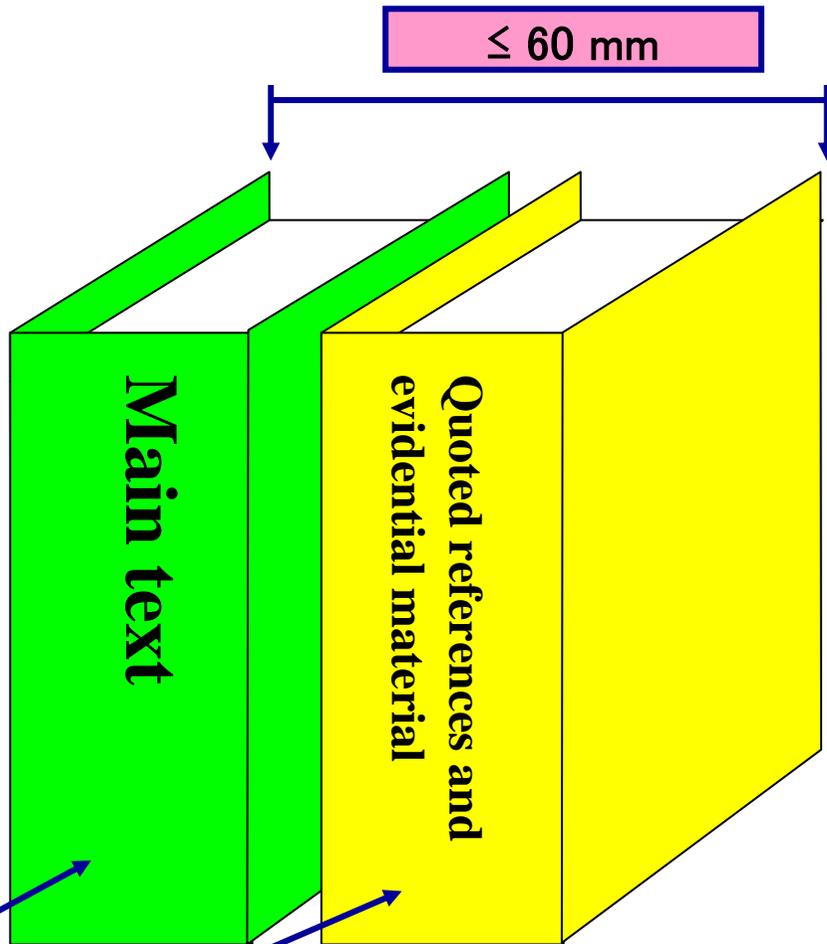
6.2 continuous Improvement

Supplement: Program Criteria by Field.

www.jabee.org/english/

Self-inspection report is a very important document because it helps the applicant institution to explain how the program satisfies the accreditation criteria, with arrangement and analysis of evidential material, and should therefore be formulated so as to be easily understood by the examiners.

Self-inspection report



1. Program information

Name of applicant institution

Name of the program

Name of the academic degree to be awarded

Content information

Table of evidential materials to be shown at the on-site examination

Numerical data related to the program

2. Results of Self-inspection

2.1 Criterion 1

2.2 Criterion 2

2.3 Criterion 3

2.4 Criterion 4

2.5 Criterion 5

2.6 Criterion 6

2.7 Program Criteria by Field

Guide/Table A Inspection Items and Inspection Criteria

A main volume, which must have pages numbered consecutively throughout the volume and contain a table of contents.

A second volume containing quoted references and evidential material must also contain a table of contents, with pages numbered separately for each chapter (criterion).

Note:

- 1) Considering **the four points** listed in 2) of the Basic policies of JABEE accreditation, the self-inspection report must be made by the applicant institution, based on “Guide to Preparing Self-Inspection Report (See www.ieice.org)”
- 2) In principle, the two volumes together should be **no thicker than 60 mm.**
- 3) Quoted reference and evidential material other than attached to the second volume of self-inspection report, will be subject to investigation at the on-site examination, thus they must be presented to the examination team on such occasion.
- 4) Explanation regarding each inspection criterion for each inspection item should be designed as self-contained, so that the examination team can determine to what extent the criterion is satisfied, without referring to the explanations regarding inspection criteria for other inspection items.
- 5) Each explanation should clearly state the page and section where the cited reference can be found.

The following four points are focused in the process of examination for accreditation:

Criterion 1

Plan: Does the program set up “appropriate learning and educational objectives” that shows the ensured level of knowledge and abilities of its graduates?

Criterion 2,3,4

Do: Is the program keeping up with the commitment described in the self-inspection report, school regulations, syllabi, pamphlets, etc?

Criterion 5

Check: Do all graduates of the program attain the knowledge and abilities defined by the learning and educational objectives of the program at a level that meets or exceeds the levels expected by engineering and industrial circles?

Criterion 6

Act: Is the built-in system for continuous improvement working within the program?

Criterion 1: Establishment and Disclosure of Learning and Educational Objectives

(1) For the purpose of fostering self-reliant engineers, the program must establish specific learning and educational objectives that concretize the contents of knowledge and abilities described in (a)-(h) below. The learning and educational objectives must disclose on or off-campus as well as must be common knowledge to the faculties and students concerned in the program.

- (a) An ability and intellectual foundation for considering issues from a global and multilateral viewpoint.**
- (b) Understanding of the efforts and impact of engineering on society and nature, and of engineers' social responsibility (engineering ethics).**
- (c) Knowledge of and an ability to apply such knowledge of mathematics, natural sciences and information technology.**
- (d) Specialized engineering knowledge in each applicable field, and the ability to apply such knowledge to provide solutions to actual problems.**
- (e) Design abilities to organize comprehensive solutions to social needs by application of science, engineering and information.**
- (f) Japanese-language communications skills including methodical writing, verbal presentation and debate abilities, as well as basic skills for international communications.**
- (g) An ability to carry on learning on an independent and sustainable basis.**
- (h) An ability to implement and organize working systematically under given constraints.**

(2) The learning and educational objectives must be established, giving due to consideration to each institution's tradition and resources, to the specific fields in which its graduates are particularly active, and to social needs and students' requirements.

Corresponding Relationships between the specific learning and educational objective and the knowledge and abilities of (a)-(h) required in Criterion I

	Program criteria by field							
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
				(1)	(2)	(3)		
(A)	◎	○		○				
(B)	○	◎		○				
(C)			◎			◎	○	○
(D)			○		◎			◎
(E)	○		○	◎		○	◎	○
.....	◎or ○							

To show strong adhesion

To show weak adhesion

This is contained as Table 2 in the self-inspection report

Program Criteria for Electrical, Electronics, Communications and Similarly Named Engineering Program

related to (d) and (e)

These program criteria apply to education programs in Electrical, Electronics, Communications and related Engineering fields, including “Electrical and Electronic Engineering”, “Info-communication Engineering”, “Electronics”, and “Instrumental, Control and System Engineering,” etc.

1. Knowledge and abilities to be acquired

- (1) The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.**
- (2) The program must demonstrate that the graduates have acquired the following;**
 - a) Knowledge of mathematics (including differential and integral calculus, differential equations, linear algebra, complex variables, and discrete mathematics), probability and statistics, basic sciences (especially physics), and engineering sciences necessary for the program name and learning/educational objectives.**
 - b) Ability not only to plan experimental projects and perform practical experiments, but also analyze and explain the experimental results, as appropriate to program learning/educational objectives.**
 - c) Ability to analyze and design devices, software, and systems, as appropriate to program learning/educational objectives.**
 - d) Ability to understand practical problems and subjects from the standpoint of engineers of specific areas shown by the name of programs.**

Program Criteria for Electrical, Electronics, Communications and Similarly Named Engineering Programs (continued)

2. Faculty

The faculty must include members who are qualified for teaching practice of the industry related to the learning/educational objectives of the programs.

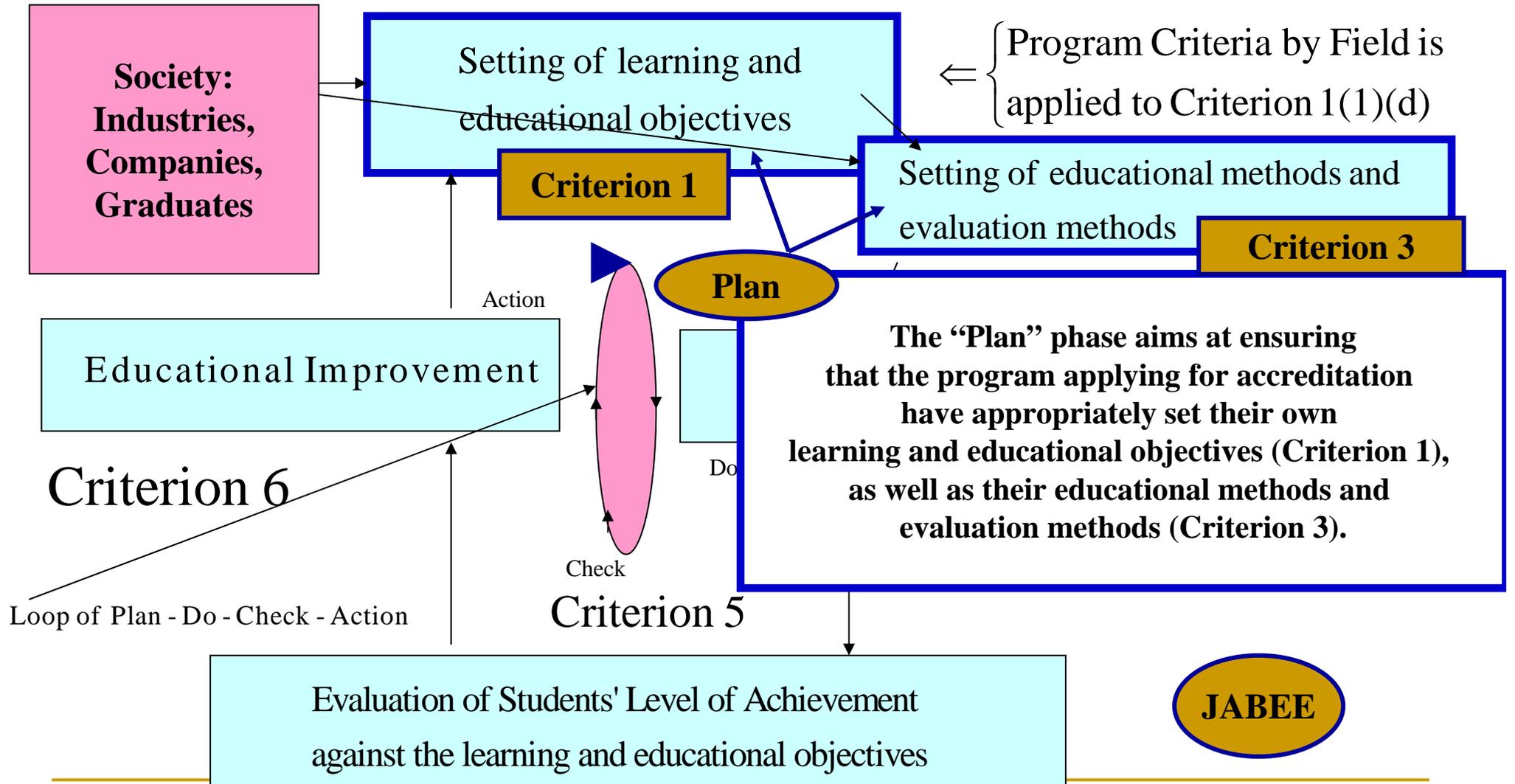
Supplementary Explanations:

- 1) IEICE and IEEJ (Institute of Electrical Engineers of Japan) are responsible for jointly conducting the evaluation of program in this field.**
- 2) Concrete discipline in the field of Electrical , Electronics, Communications and similarly named fields and contents/ objectives of educational program should be established by applicant institutions.**

(See www.ieice.org/eng/index.htm)

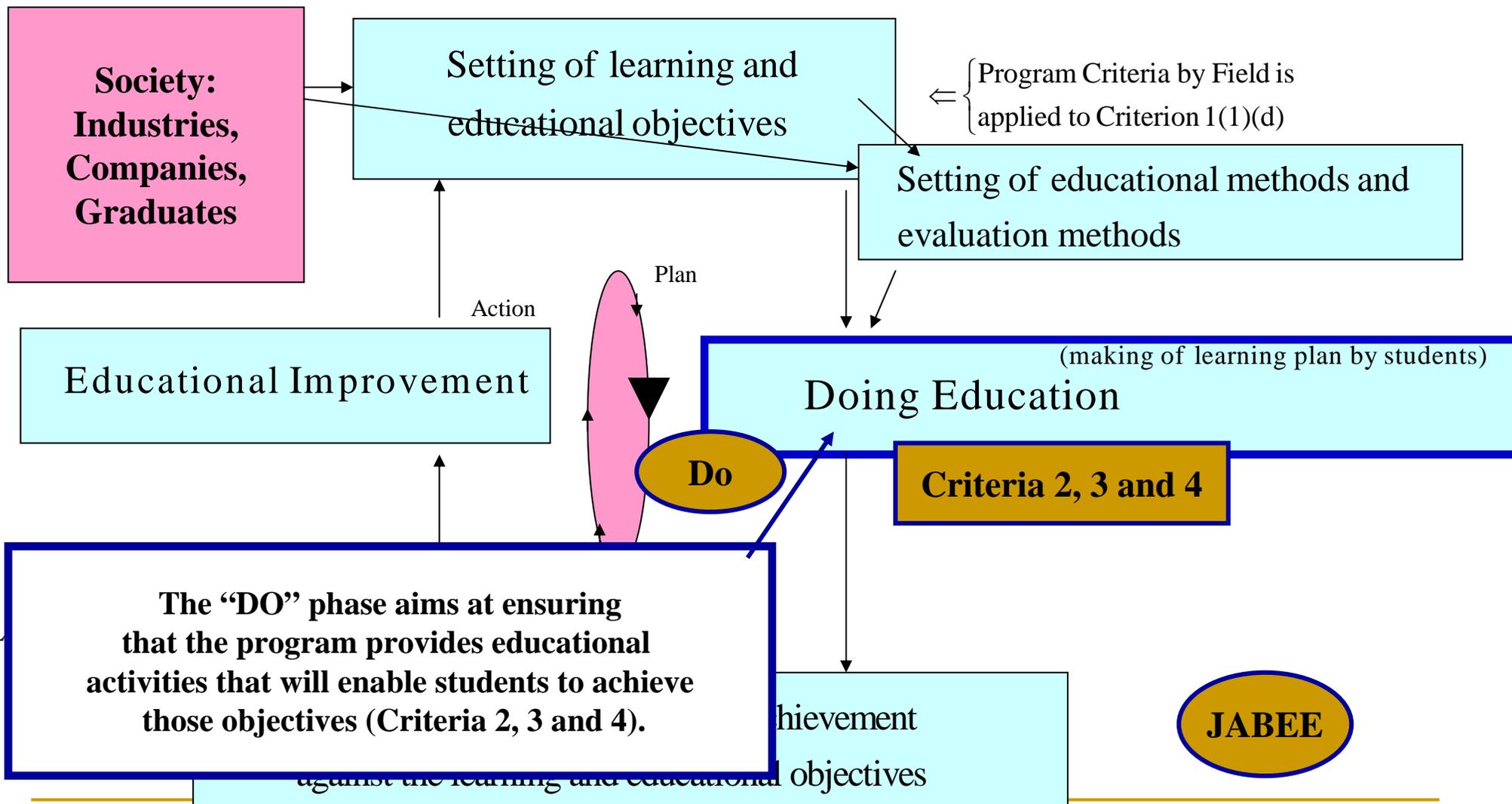
Quality assurance: “Plan-Do-Check-Action Loop” system

Societal evaluation



Quality assurance : “Plan-Do-Check-Action Loop” system

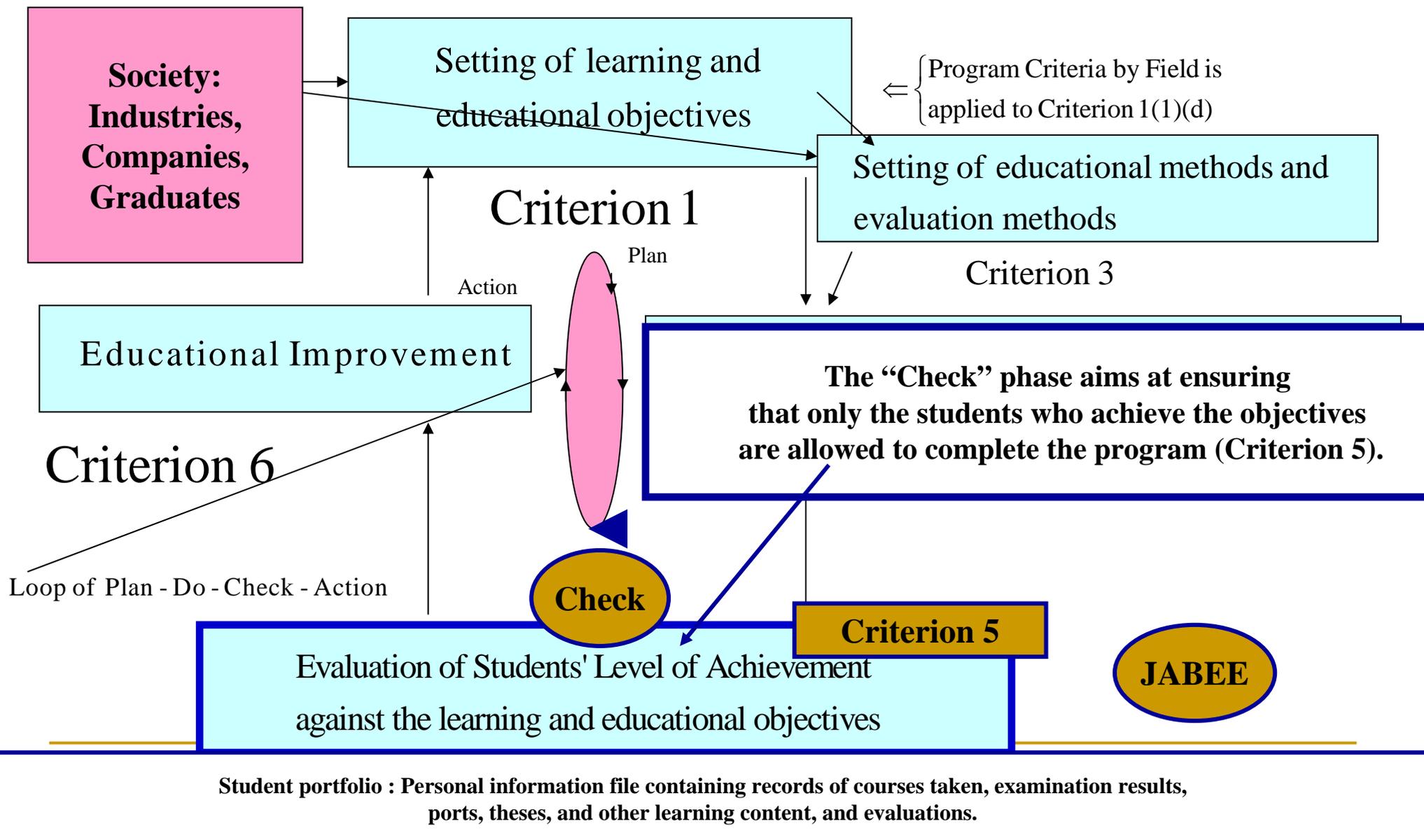
Societal evaluation



Student portfolio : Personal information file containing records of courses taken, examination results, reports, theses, and other learning content, and evaluations.

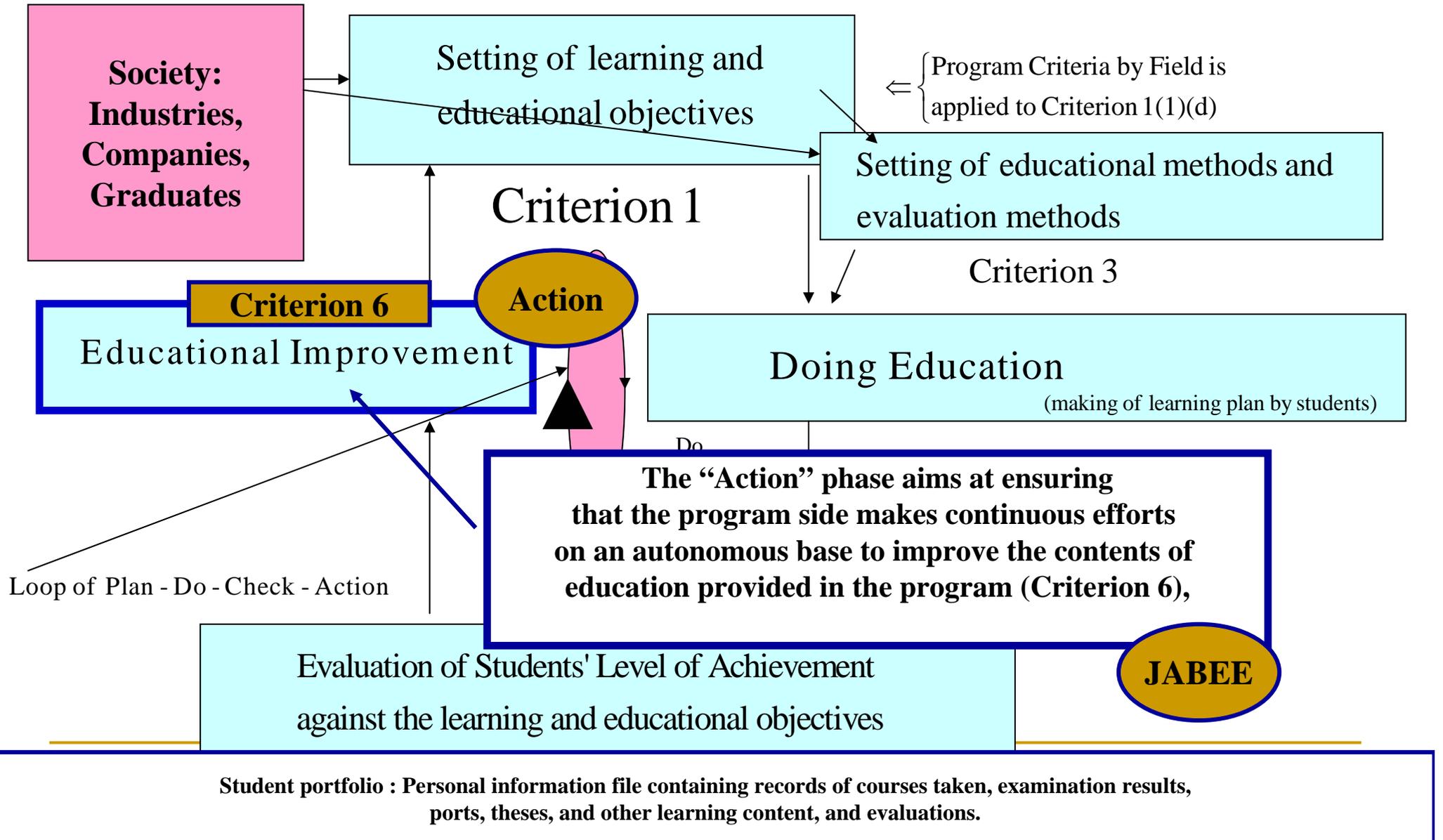
Quality assurance : “Plan-Do-Check-Action Loop” system

Societal evaluation



Quality assurance: “Plan-Do-Check-Action Loop” system

Societal evaluation



The Criterion 5 requests the following:

(1) Is students' achievement against each subject's objectives evaluated, in accordance with the evaluation methods and criteria as described in the syllabi?

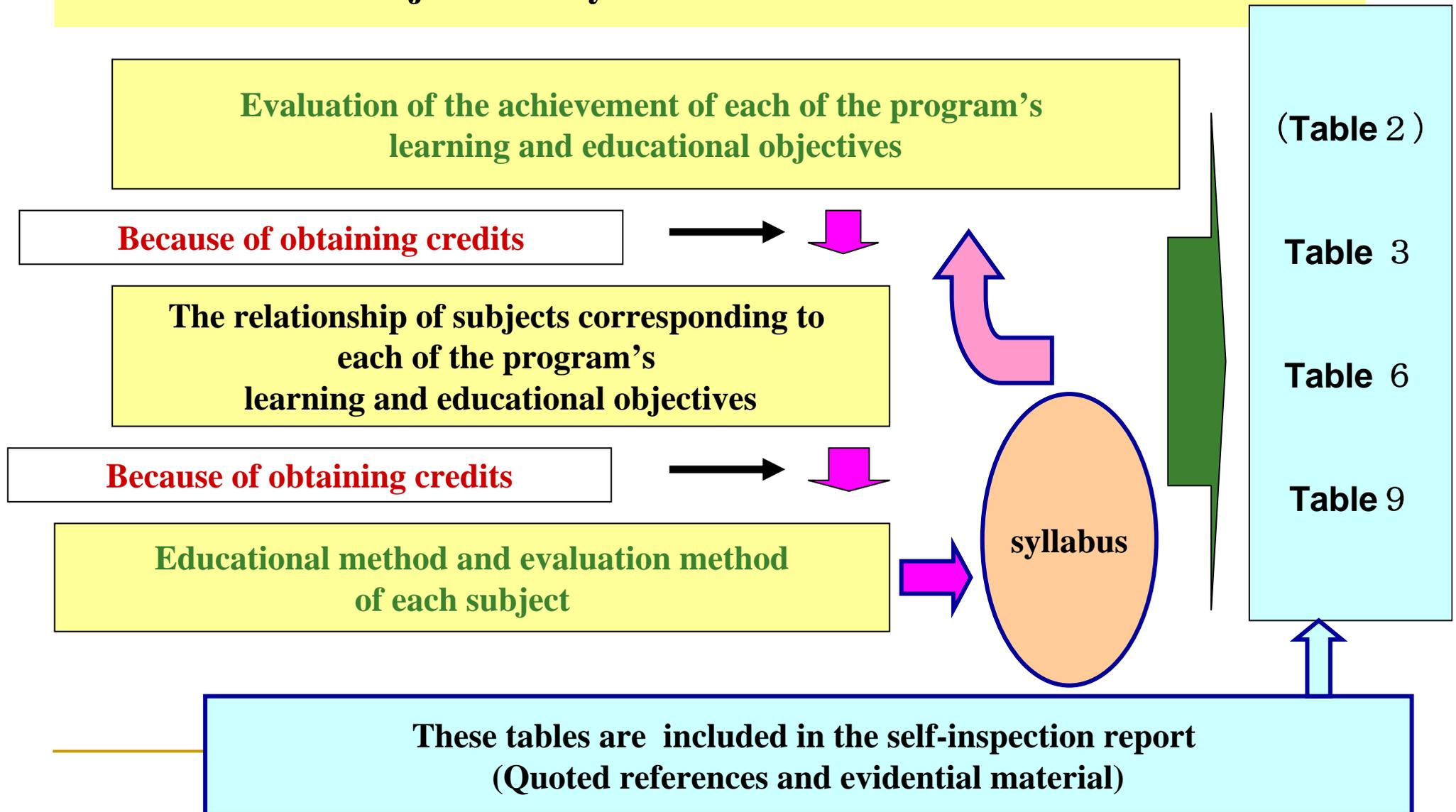
(Mainly by reviewing the relevant reference materials such as syllabi, student performance reports, test questions and answer papers, course work, student design production, and graduate theses, etc., at the time of on-site examination.)

(2) Does the program provide methods of evaluating the credits earned by the students at other institutions of higher education? or by the transferred students

(3) Has the program established methods and criteria for comprehensively evaluating the level of students' achievement against each learning and educational objective of the program? Are the evaluations carried out properly according to such methods and criteria?

(4) Is a scheme established to confirm whether all the program graduates have achieved all of the program's learning and educational objectives? Is the program-completion judged on the basis of such scheme?

For evaluating whether or not students achieve the program's learning and educational objectives, setting of educational methods and evaluation methods of each subject is a key.

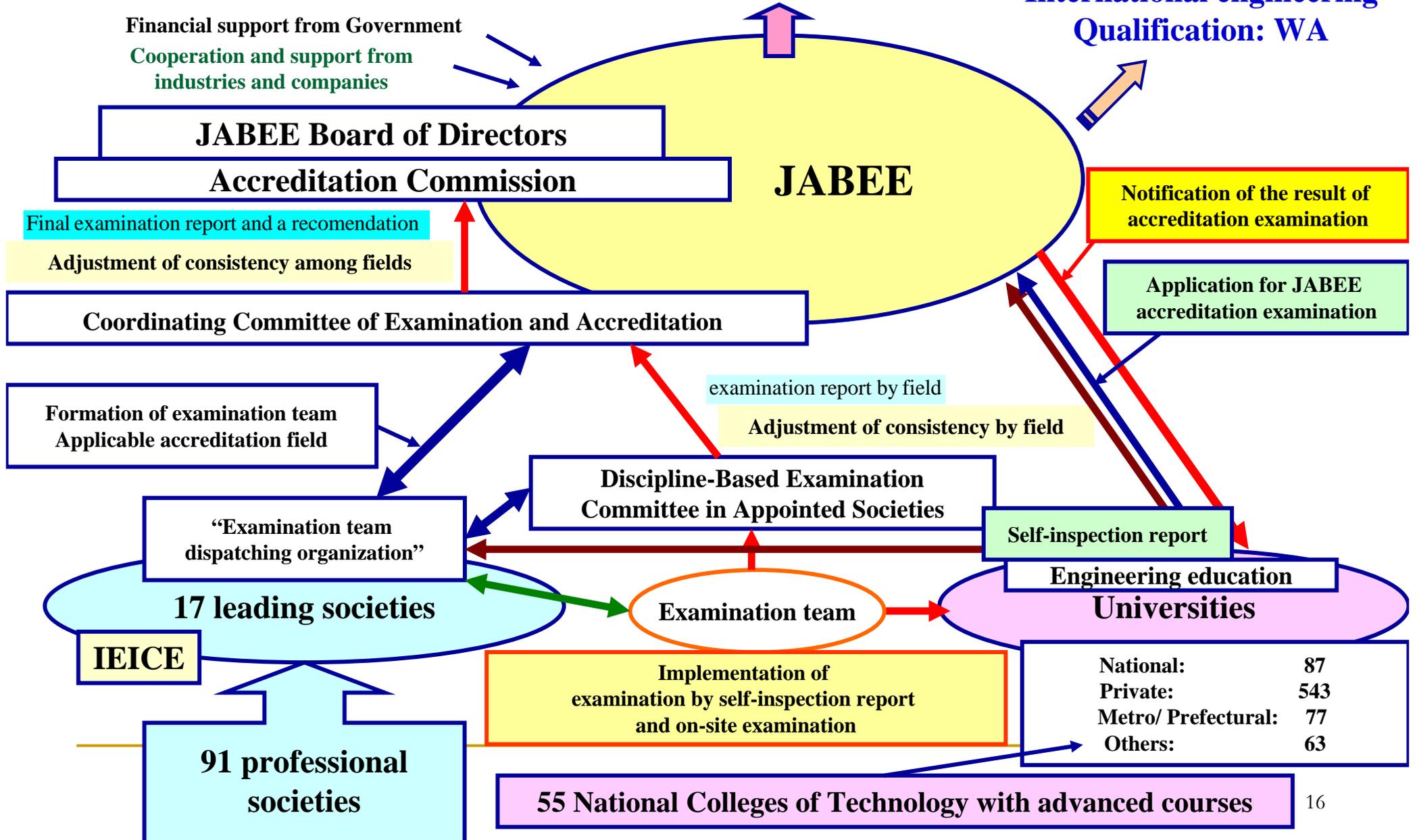


Triangle relationship among JABEE, professional societies (associations), and universities

Accreditation and publicity

**International engineering
Qualification: WA**

Financial support from Government
Cooperation and support from industries and companies



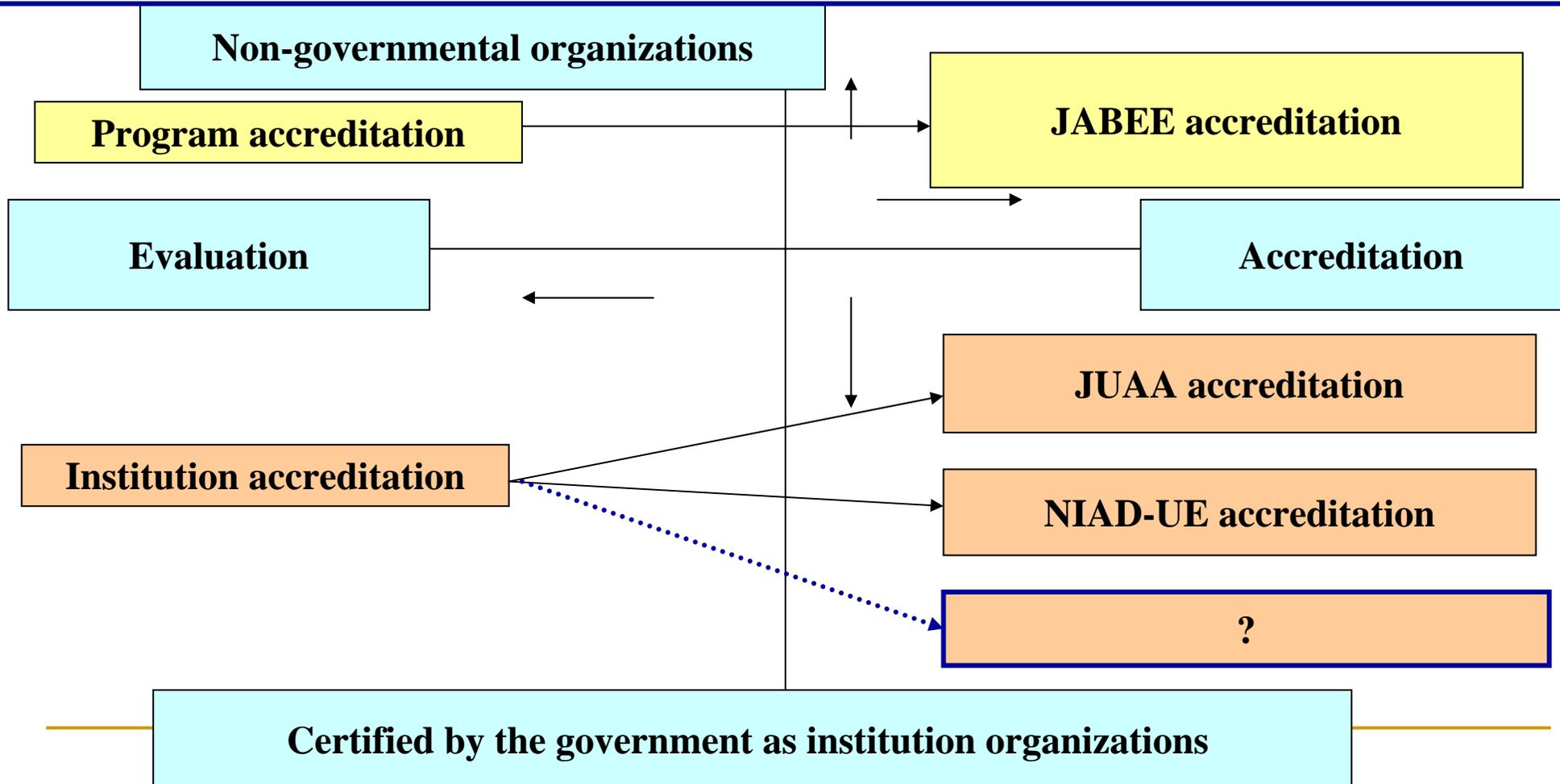
-
- ◇ **Programs are accredited for 5 years.** The names of accredited programs are announced to the public over that period of 5 years. Graduates of the program during the 5 years, including the year in which the examination of the program is successfully completed, are considered to be accredited graduates.

However, when a program is founded to satisfy almost all of the criteria while having “weakness” for some reasons, the term of validity may be usually reduced to **the period of 2 years**, with the intention of encouraging rectification. While the term of validity is notified to the institution concerned, it will not be disclosed to the public.

To enjoy continuous accreditation, the program must be re-examined to be accredited again **within the year that follows the final year of the term of validity.**

- ◇ Now in Japan, universities are very competitive in getting grants in research and education from the government. Such competition activates universities in various directions. Also, at the entrance examinations in these years in Japan, about 30 % of universities could not get students up to the respective capacities of students. Such trends are going from bad to worse, because the number of students preparing for entrance examinations is decreasing year by year (because of the decrease of birthrates in these twenty years). Therefore, universities are going into a survival race of getting as many students of high quality as the respective capacities of students. **Universities losing, or not getting, accreditation will be unable to win such a survival race.**
-

◇ As organizations of accrediting institutions in Japan, Japan University Accreditation Association (JUAA, 1947), National Institute of Academic Degrees and University Evaluation (NIAD-UE) and one or two will be certified by the government this year. As regards to education, universities in Japan are now expected to establish their own education systems of high quality which can be accredited **by JABEE on engineering educational program level**, and by JUAA, NIAD-UE and others **on institution level**.



- ▶ Answers to most of the common questions from the workshop organizers are included in the above slides. Answers to the remaining questions are:

- ✓ Are there “engineering-like” programs that require less mathematics and basic sciences in your country?

Yes, in Japan.

- ✓ If so, are these programs accredited?

No, in Japan.

- ✓ Please provide any other information that you think might be interesting or useful.

“It is now expected by leading industries and companies in Japan for JABEE to accredit **engineering educational programs in the graduate schools** as well. JABEE is now discussing the related matters in committees. We would like to know the corresponding information in the countries attending at this workshop.”

Thank You

