

KFUPM Experience in Program Assessment and Accreditation

Dr. Mohammad S. Al-Homoud

Director, Program Assessment Center

Deanship of Academic Development

King Fahd University of Petroleum & Minerals

Dhahran 31261

assess@kfupm.edu.sa

What is Assessment?

Assessment is a **systematic ongoing, iterative process of monitoring** (recording and analyzing) student **learning outcomes** and processes in order to determine what we are **doing** well and what we must **improve**.

What is the aim of program assessment?

The aim of program assessment is to **understand** how **educational programs** are working and to determine whether they are contributing to **student growth** and development. It focuses on **programs** rather than on **individual students**. It provides information on whether the **curriculum as a whole** provides students with the **knowledge, skills** and **values** that graduates should possess in accordance with its **mission** and set goals and **learning objectives**.

New Philosophy

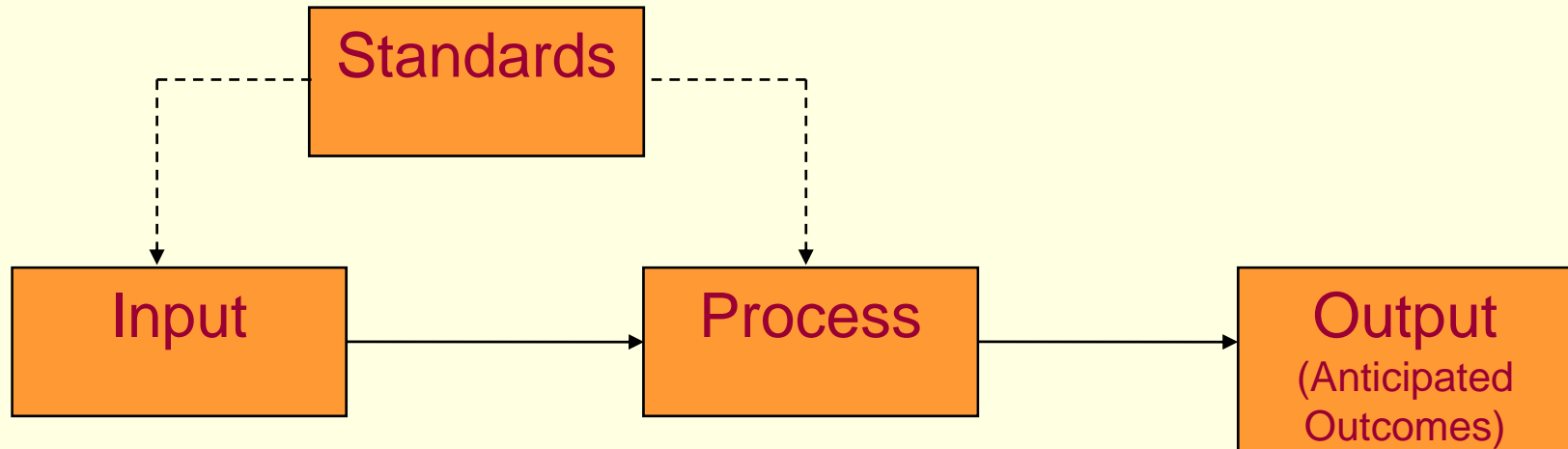
Traditional Emphasis

- What we give students?
- Inputs
- Faculty teaching
- Curriculum
- Educational activities as an end
- More quantitative (how much)
- Prescriptive based

New Emphasis

- What they can/are able to do?
- Outcomes
- Student learning
- Education
- Educational activities as means to an end
- More qualitative (how well)
- Outcome-based

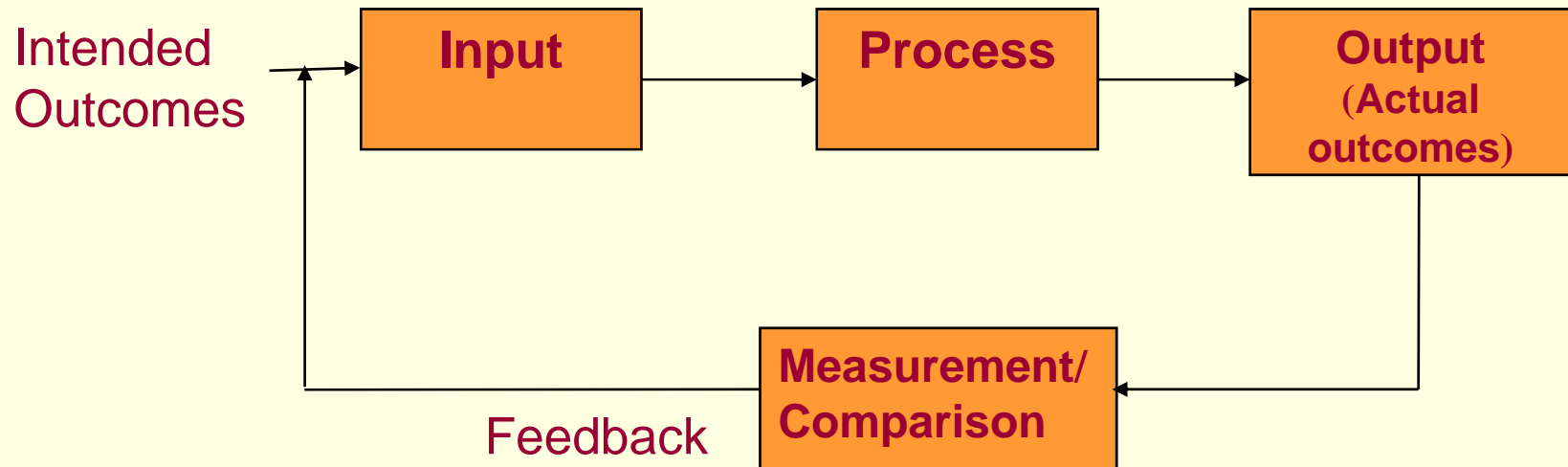
Traditional Educational Process



Traditional Educational Process

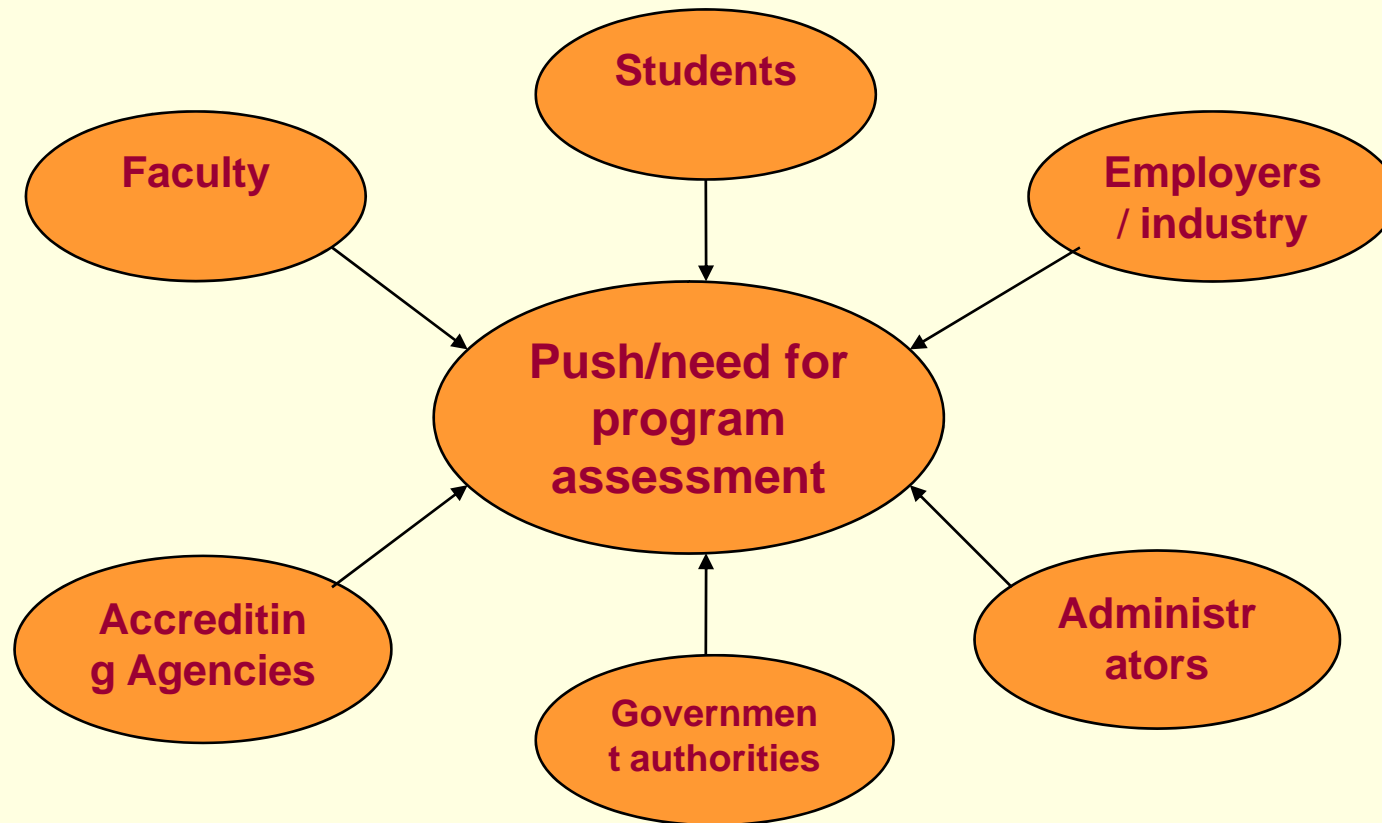
(Prescriptive, teaching focused)

Outcome-Based Assessment



Outcome-Based Assessment
(Outcome-based, learning focused, continuous feedback/improvement)

Assessment Driving Forces



Assessment Driving Forces

Approaches to Assessment

What to assess (educational outcomes)?

- Cognitive (knowledge-based) :
what should students know?
- Affective (attitudes and values) :
what should students value?
- Psychomotor (skills) :
what should students do or be able to do?

Approaches to Assessment

Whom to assess (objects)?

- Students
- Faculty
- Course
- Program

Why assess (purpose)?

- **Formative:** on going (e.g. to ascertain progress or development)
- **Summative:** at the end (e.g. to ascertain mastery level of achievement)

Assessment Steps

Assessment Process Requires:

- Recognition/commitment
- Setting appropriate assessment **criteria**
- Defining program **constituents**
- Defining program/institution **mission** statements
- Defining educational **objectives** that meet program / institution constituents
- Defining program **outcomes**
- Defining measurable performance **measures**
- Selecting appropriate **assessment methods**
(make sure to use multiple methods)

Assessment Steps

Assessment Process Requires:

- Collecting necessary **data**
- Emphasizing on **outcomes** (graduates preparation for professional practice)
- Demonstrating how criteria and program educational objectives/outcomes are **being met**
- Seeking external **review (evaluating results)**
- Implementing **actions** for improvement
- Following-up on implementation
- Defining and **repeating** the process

Assessment Steps

Mission

Goals

Objectives

Outcomes

Assessment

tools

Assessment
activities

Actions for
improvement

Goals and Objectives

Program Educational Objectives

- Statements that describe the expected accomplishments of graduates during their *first few years of career after graduation* as a result of their educational preparation.

(Distinguish program objectives from department objectives. They are not the same)

Goals and Objective

Audience for objective statements:

Constituents external to the institution including:

- Prospective students
- Parents
- Student sponsors, donors, and contributors
- Employers
- Transfer institutions, graduate programs
- Industry advisors
- Accrediting agencies
- Government organizations

Program Outcomes

Program Outcomes

- Statements that describe what students are expected *to know and be able to do by the time of graduation*. These relate to the knowledge, skills and behaviors that students acquire in the program.
- Intended outcomes (from described statements of expected learning outcomes)

Program Outcomes

Program Outcomes

- Actual outcomes (form the results of assessment activities)
- Achievements of all program outcomes should indicate that the graduate is prepared to achieve the program educational objectives and should be verified before certification for graduation.

Mapping Outcomes and Objectives

Example:

Program Outcomes	Program Objectives			
	1	2	3	4
1. Engineering Design				
2. Oral Communication				
3. Critical Thinking				
4. Professional Ethics				

Mapping Courses and Outcomes

Example:

Courses	Outcomes			
	Engineering Design	Oral Communication	Critical Thinking	Professional Ethics
1.				
2.				
3.				
4.				

Program Objectives/Outcomes Assessment

Objectives/ Outcome	Performance Criteria	Assessment Method	When Assessed?	Recommendation s	Actions
	What is assessed? (What characteristics, knowledge, skills, attitudes, and/or values will the student exhibit so you will know you have achieved the desired objective?)	How is it assessed? (What methods were used to gather evidence of performance criteria?)	When assessed? (When assessment was conducted?)	What recommendations are made? (Based on the assessment data)	What actions were taken to implement the recommendations? If not, why not?
Objective/ Outcome 1					
Objective/ Outcome 2					

Assessment Methods

I. Direct Assessment Methods:

- Directly determine whether students have mastered the content of their academic programs.
- Require students to display their knowledge and skills as they respond to the instrument itself (i.e. objective tests, essays, presentation, and classroom assignments).

Assessment Methods

Direct assessment methods include:

- Standardized exams
- Locally developed exams
- Oral exams
- Portfolios (work collected over time)
- Performance appraisal

Assessment Methods

Direct assessment methods include (Cont.):

- Oral presentations
- Simulations, demonstrations, case studies
- Capstone experience (embodied in capstone courses)
- Juried activities
- Evaluation of field work
- Behavioral observations (classroom observations)

Assessment Methods

II. Indirect Assessment Methods:

- Ask students to reflect on their learning, what they have learned and experienced, rather than to demonstrate it (i.e. surveys and interviews).
- Details about instructional or curricular strengths that can not be provided by direct methods alone.

Assessment Methods

Indirect assessment methods include:

- Written surveys and questionnaires
 - Employers
 - Alumni
 - Parents
 - Faculty
 - Graduating seniors
 - Current students
 - Entering students
- Exit interviews
- Focus groups
- External examiner
- Archival records

Assessment Methods

Example: Direct Assessment Method

COOP STUDENT'S EVALUATION		Score	
• Enthusiasm and interest in work			•
• Attitude towards delivering accurate work			•
• Quality of work output			•
• Initiative in taking tasks to complete			•
• Dependability and reliability			•
• Ability to learn and search for information			•
• Judgment and decision making			•
• Maintaining effective relations with co-workers			•
• Ability of reporting and presenting his work			•
• Attendance			•
• Punctuality			•

Overall rating for the student's performance	Poor	Marginal	Good	V. Good	Excellent	:
• Comments if any:						

Assessment Methods

Example: Direct Assessment Method

Senior Design Project Evaluation Example:

Category				
Engineering Solutions	Report Writing & Completeness	Integration	Graphical Presentation	Oral Presentation
40%	20%	20%	10%	10%

Program Self-Assessment at KFUPM

Program Assessment Center:

Mission

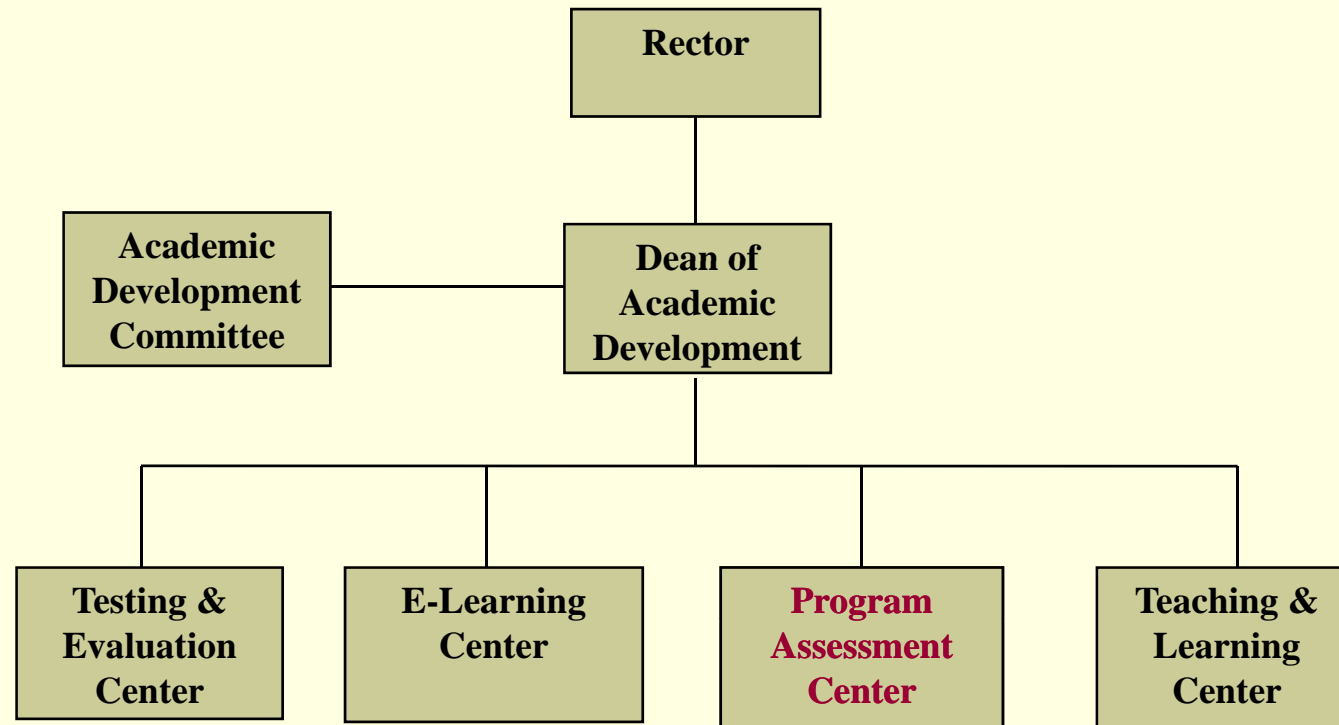
- Promote university-wide culture of assessment towards developing quality education that copes with new technological changes and meets industry needs while retaining out Islamic values.

Program Self-Assessment at KFUPM

Program Assessment Center: Objectives

- Promote the culture of assessment university-wide;
- Improve and maintain the highest academic standards at KFUPM;
- Enhance students' learning outcomes;
- Provide support for academic programs to meet their objectives and institutional goals;
- Provide feedback for quality assurance of academic programs;
- Prepare the academic programs for national/international accreditation.

Program Self-Assessment at KFUPM



Deanship of Academic Development Organization Structure

Program Self-Assessment Criteria at KFUPM

The self-assessment guidelines consist of a set of eight criteria to be met by the program:

- Each criterion is judged by meeting a set of standards associated with it.
- The Program Assessment Center (PAC) at the Deanship of Academic Development (DAD) is responsible for planning, coordinating and following up on the self- assessment (SA) activities.
- The PAC follows up on the implementation plan to ensure that Departments are adhering to and reporting on the implementation of the assessment findings.

Program Self-Assessment Criteria at KFUPM

- C1. Program Mission, Objectives and Outcomes
- C2. Curriculum Design and Organization
- C3. Laboratories and Computing Facilities
- C4. Student Support and Advising
- C5. Faculty
- C6. Process Control
- C7. Instructional Facilities
- C8. Institutional Support

Program Self-Assessment Criteria at KFUPM

- C1. Program Mission, Objectives and Outcomes
 - S1.1 Measurable objectives
 - S1.2 Program Outcomes
 - S1.3 Actions for improvement
 - S1.4 Overall assessment using quantifiable measures

- C2. Curriculum Design and Organization
 - S2.1 Courses vs. objectives
 - S2.2 Theory and problem analysis and design requirements
 - S2.3 Mathematical and basic sciences requirements
 - S2.4 Major Requirements
 - S2.5 General Education requirements
 - S2.6 Information technology requirements
 - S2.7 Communication skills (oral and written) requirements

Program Self-Assessment Criteria at KFUPM

C3. Laboratories and Computing Facilities

- S3.1 Lab manuals/documentation/instructions
- S3.2 Lab support personnel
- S3.3 Computing facilities

C4. Student Support and Advising

- S4.1 Frequency of course offering
- S4.2 Student advising and counseling

C5. Faculty

- S5.1 Number of full time faculty
- S5.2 Faculty currency and development
- S5.3 Faculty recruitment and retention

Program Self-Assessment Criteria at KFUPM

C6. Process Control

S6.1 Admission process

S6.2 Registration process

S6.3 Effective teaching and learning assurance process

S6.4 Program requirements completion assurance process

S6.5 Curriculum and textbooks update and approval process

Program Self-Assessment Criteria at KFUPM

C7. Institutional Facilities

S7.1 New trends in learning (e.g. e-learning)

S7.2 Library collections and staff

S7.3 Class-rooms and offices adequacy

C8. Instructional Support

S8.1 Financial and technical support for faculty

S8.2 Number and quality of graduate students

S8.3 Financial support for library, labs and computing facilities

Program Self-Assessment Procedure at KFUPM

The program self-assessment is conducted at KFUPM as follows:

- SA is initiated by the Program Assessment Center (PAC)
- Department form Program Team (PT) responsible for preparing the Self-Assessment Report (SAR)
- The report is submitted to PAC and reviewed for its completeness and compliance with the self-assessment guidelines

Program Self-Assessment Procedure at KFUPM

- A program assessment team (AT) is formed from three members:
 - External (from an international institute)
 - Internal (from another department within KFUPM)
 - The program self-assessment team leader (as a facilitator)
- The AT reviews the SAR prior to the visit to the department
- A one week visit is arranged for the AT to visit the department, review documents, interview faculty, students, and administrators and visits classrooms, labs, etc.

Program Self-Assessment Procedure at KFUPM

- The AT prepares a report on their findings indicating the program strengths, weaknesses, and recommended actions for improvement.
- The report is presented in an exit meeting attended by all concerned
- The PAC presents an executive summary on the assessment findings to the Rector
- Department develop an implementation plan for corrective actions based on AT findings and recommendations

Program Self-Assessment Procedure at KFUPM

- The plan is reviewed and approved by the concerned officials
- The PAC follows up on implementation
- The department keeps record of all necessary data (surveys, reports, interviews) on a regular basis for future assessment activities.
- The process is repeated every five years.

At KFUPM:

- Seven academic programs have completed their first cycle of SA
- Eleven academic programs are finalizing their self-assessment reports

KFUPM Experience in Program Accreditation

- **Engineering Programs**
 - ABET (substantial equivalency):
 - 1st visit in 1993
 - 2nd visit in 2001
 - 3rd visit soon
- **Industrial Management Programs**
 - AACSB (accreditation):
 - 1st visit in 2002
 - 2nd visit soon
- **Science Programs**
 - Berkeley Team Review in 1995

Assessment Considerations

- Assessment is the foundation of continuous quality improvement
- The right inputs and processes do not necessarily guarantee the intended outputs unless proven (measured).
- More data does not necessarily mean better results
- Pilot testing of the assessment approach is important

Assessment Considerations

- No single method will satisfy all needs, there is more than way to reach the goal.
- Utilize the available time and resources
- Involve all faculty in the assessment process
- Involve all possible constituents
- Assessment is meant for improvement. Therefore, show weaknesses as well as strengths
- Act for improvement/share results
- Remember: If you can not define it, you can not measure it; If you can not measure it, you can not manage/improve it.

Assessment Key Success Factors

Assessment Key Success Factors Include:

- Commitment
- Participation (involvement) of all constituents
- Listening to voices
- Actions for improvement
- Feedback
- Relating assessment to the world of work
- Continuity and flexibility
- Consistency of reporting format over time
- History of results
- Responsibility
- Resources
- Rewards

References

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4. ABET "ABET International Faculty Workshop for Continuous Program Improvement", The National University of Singapore, Singapore, December 2003.
5. ISO/IEC guide 2:96
6. Gaff, Jerry G. and James L. Ratcliff, and Associates. 1997. Handbook of the Undergraduate curriculum: A Comprehensive guide to purposes, structures, practices, and change. Chapters 28, 29, and 30. Jossey-Bass Pub., San Francisco.
7. Many websites on assessment (list of related websites is available on the Program Assessment Webpage-
<http://www.kfupm.edu.sa/dad/>)

THANK YOU