Measuring Quality

Strategies for Writing and Assessing Learning Outcomes

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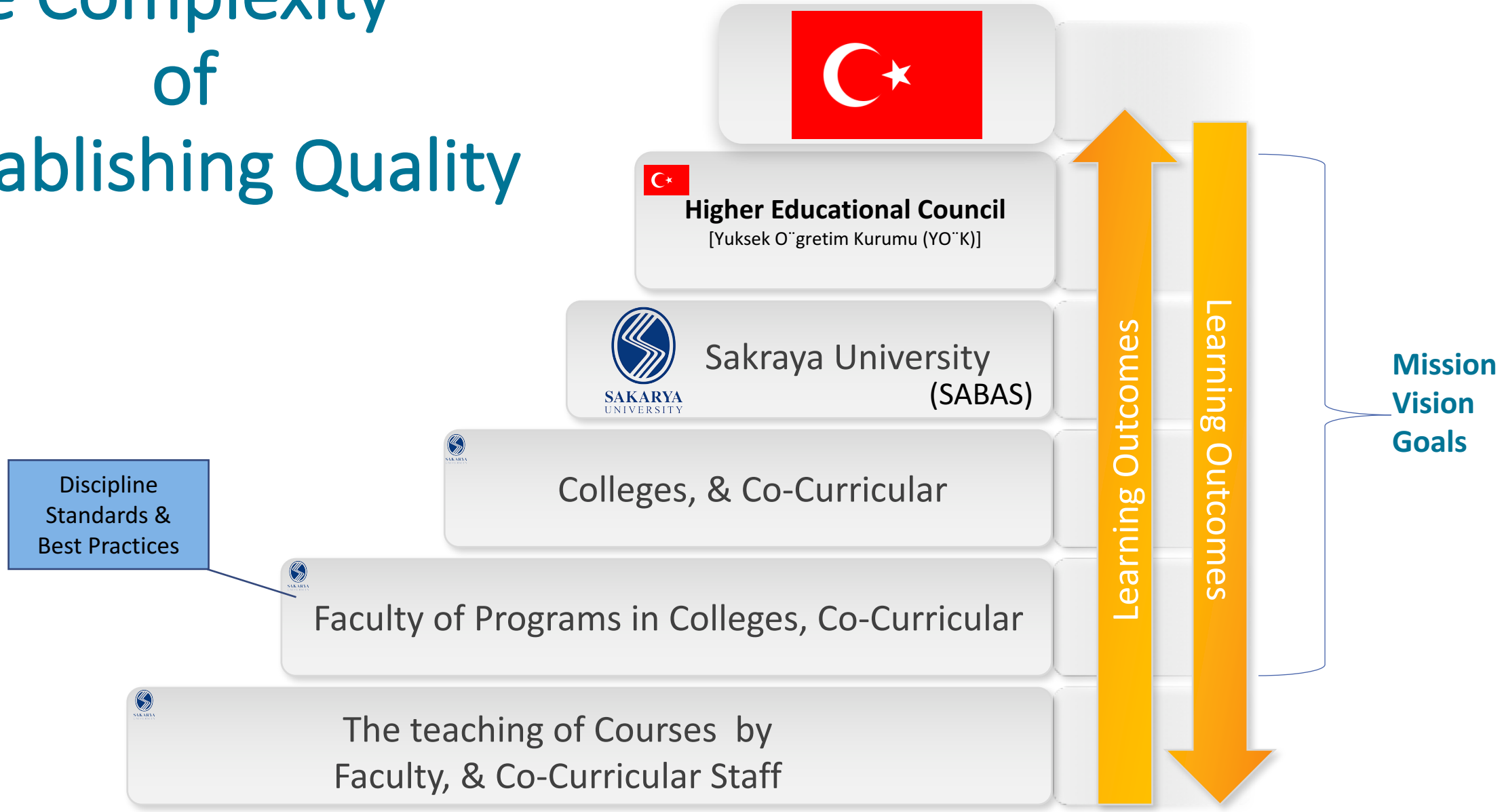
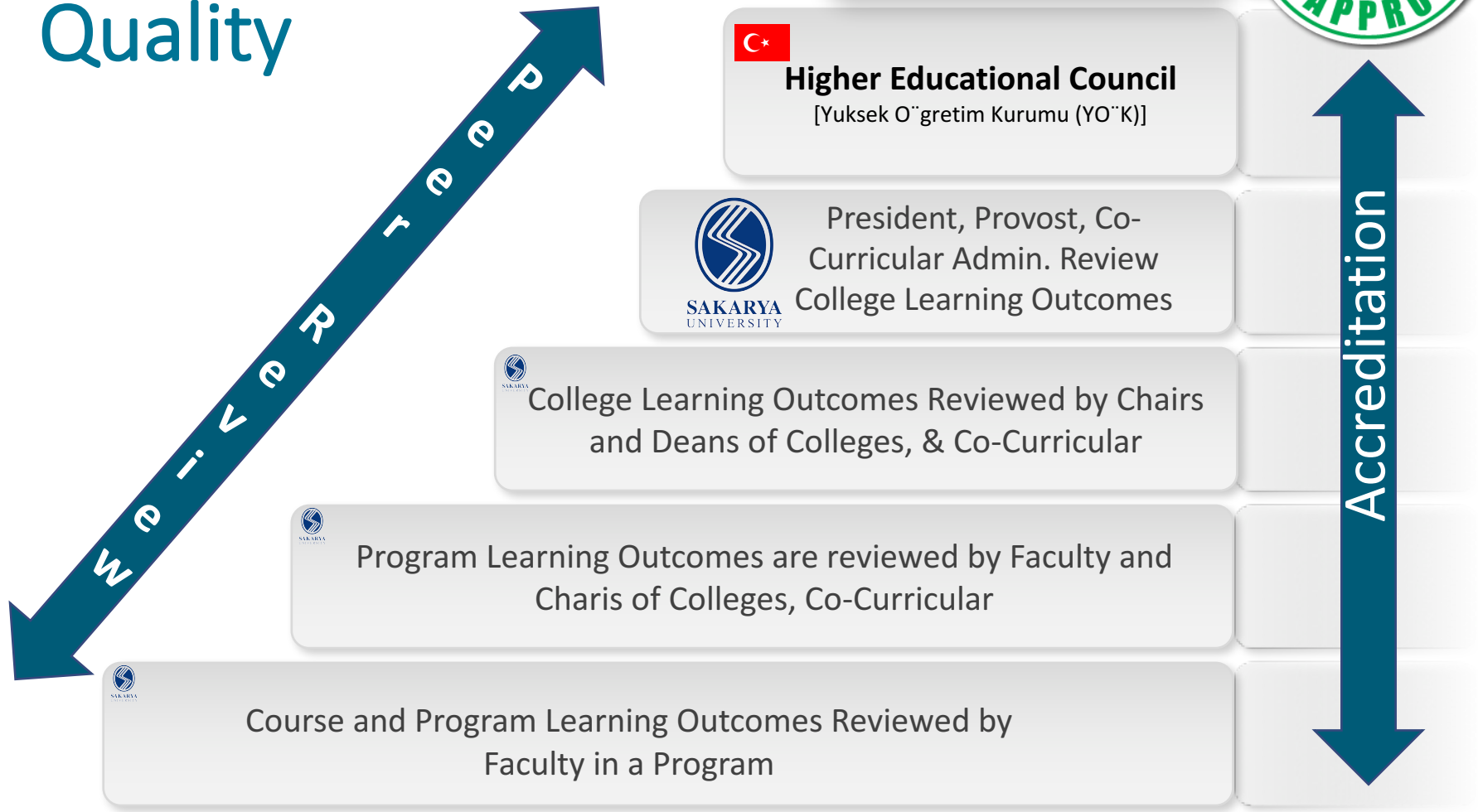
The Complexity of Establishing Quality



Peer Review is the "Gold Standard" of the Measurement of Quality



Plan: Identify what needs to be learned?

Identify Learning Outcomes

Gather Evidence

Do: Was it the correct evidence?

Check: Peer review of the evidence to make sure we are on the right track.

Interpret Evidence

Implement Change

Act: What impact will the change have on other areas of the university/ college/program?

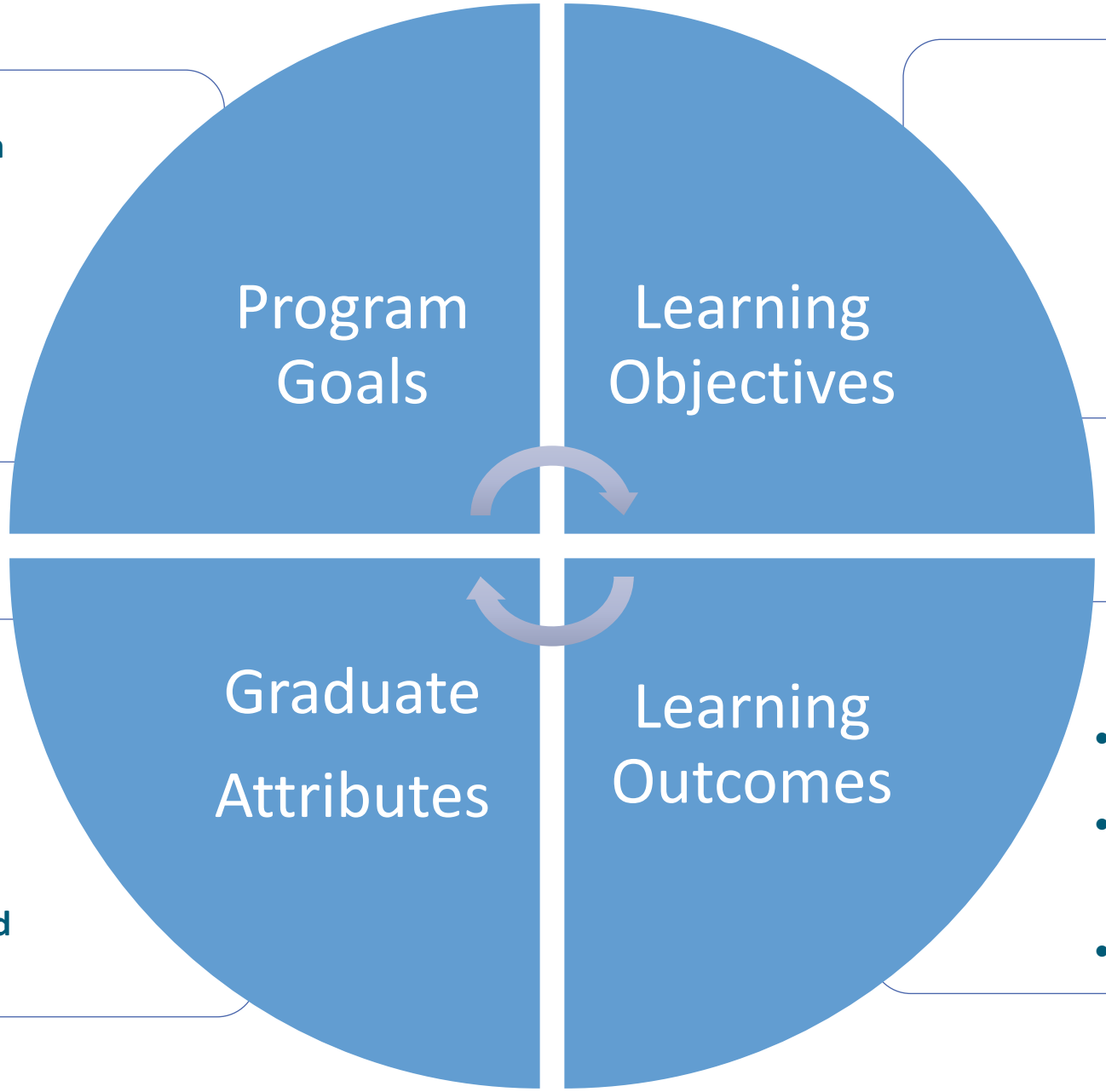
Mission, Vision, Goals, & Learning Outcomes

Learning Outcomes (LOs) are what students know and are able to do when they leave your course, program, university.

Learning Outcomes are at the heart of measuring quality.

Writing Learning Outcomes

Understanding the Language of Learning



- Framed from the Program perspective.
- Measures specific skills and knowledge levels of the program.

- Framed from the Instructor perspective.
- What the instructors are responsible for – linked to teaching style. Focus on content.

- Framed from the Community & Graduate perspective.
- What is the knowledge, skills and attitudes needed to be hired in the field?

- Framed from a Student perspective.
- Describe significant and essential learning that the learner should achieve.
- Focus on student learning.

Learning Objectives

- The knowledge, skills, abilities, capacities, attitudes or dispositions the teacher expects students to acquire in your program.
- Teacher centered.
- They should meaningfully define the related goal, and, where possible, indicate desired level of attainment.
- Instructor statements guiding the path toward learning outcomes

VS

Learning Outcomes

- Learning outcomes are specific, observable behaviors evidenced by students who have achieved your learning objectives.
- Student focused.
- Learning outcomes are stated operationally, and describe the observable evidence of a student's knowledge, skill, ability, attitude or disposition.
- Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after the completion of a process of learning.

(Kennedy, et all, XXX)

Learning Objectives

VS

Learning Outcomes

By the end of EDCT 2030, the student will:

- Understand the benefits of technology in the classroom.
- Recognize the benefits of technology use in the classroom.
- Recognize the benefits using technology for teaching and learning.
- Engage in meaningful learning though critical thinking regarding technology use in the classroom.

Teacher Developed Environment

By the end of EDCT 2030, the student will be able to:

- Identify the seven steps to digital citizenship when using technology in the classroom.
- Analyze an educational website to determine the credibility of the website for use in the classroom.
- Compare and contrast the types of writing software used in the classroom by students.
- Prepare a technology-infused lesson plan that is appropriate for the grade level and subject taught.

Student Doing Activities

Parts of an Learning Outcome (LO)

- **A performance** (performed by the learner/student)
- **Conditions** (under which the learner must perform the performance)
- **Criteria** (by which the performance is evaluated by another; or, in other words, how well the learner must perform the performance)

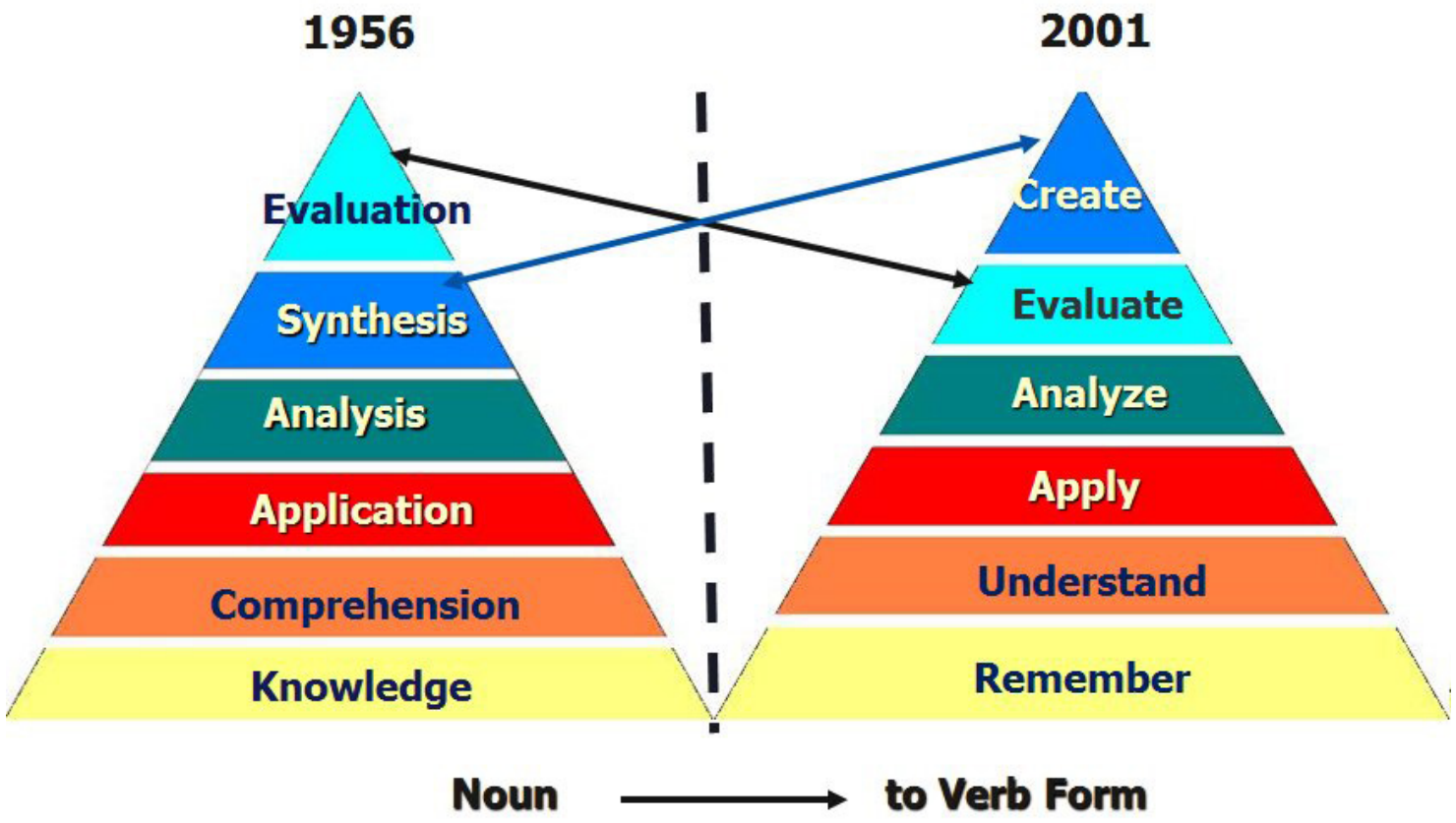
LO Writing Sample:

By the end of _____, the student will be able
(Program/Course/Lab)

to _____ _____ _____.
verb criteria/level condition

(Program/Course/Lab) verb
By the end of EDCT 2030, the student will be able to Identify all (100%) seven
criteria/level condition
steps to digital citizenship when using technology in the classroom.

Bloom's Taxonomy & LOs



Cognitive Domain:
"What do you want the learner to ***know, be able to do***?"

Affective Domain: "What do you want the learner to ***think, value, or care about***?"

Psychomotor Domain:
"What do you want the learner to ***be able to do***?"

Knowledge

The Knowledge Dimensions	Cognitive Processes					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
Factual						
Conceptual						
Procedural						
Metacognitive						

- **Factual Knowledge** is knowledge that is basic to specific disciplines. This dimension refers to essential facts, terminology, details or elements students must know or be familiar with in order to understand a discipline or solve a problem in it.
- **Conceptual Knowledge** is knowledge of classifications, principles, generalizations, theories, models, or structures pertinent to a particular disciplinary area.
- **Procedural Knowledge** refers to information or knowledge that helps students to do something specific to a discipline, subject, or area of study. It also refers to methods of inquiry, very specific or finite skills, algorithms, techniques, and particular methodologies.
- **Metacognitive Knowledge** is the awareness of one's own cognition and particular cognitive processes. It is strategic or reflective knowledge about how to go about solving problems, cognitive tasks, to include contextual and conditional knowledge and knowledge of self.

http://thesecondprinciple.com/teaching-essentials/beyond-bloom-cognitive-taxonomy-revised/; colorized version from original by Anderson, L. W. and Krathwohl, D. R., et al (Eds..) (2001); http://www4.uwsp.edu/education/lwilson/curric/newtaxonomy.htm (2001, 2005), revised 2013

SAMPLE

University Learning Outcomes for Undergraduates

Goal: In order to lay the foundations for life-long learning, by the time they graduate, Notre Dame undergraduates will be able to:

- Acquire, synthesize, and communicate knowledge by incorporating relevant disciplinary approaches, cultural perspectives, and Catholic intellectual tradition.
- Recognize moral and ethical questions in lived experiences, evaluate alternatives, and act with integrity.
- Contribute to the common good by displaying a disciplined sensibility and committed engagement in response to complex challenges facing local, national, or global communities.
- Demonstrate the vision and self-direction necessary to articulate, set, and advance toward their goals.
- Think critically in formulating opinions or accepting conclusions.
- Exhibit creativity or innovation in the pursuit of their intellectual interests.
- Display a level of mastery in their major field(s) of study that enables them to successfully pursue professional careers or advanced study.

SAMPLE

College Learning Outcomes for Undergraduates

The goal of the Mendoza College of Business is to assist and guide students in preparation for lifelong learning, for effective citizenship and for professional careers as competent and ethical participants in business, government, and other complex organizations.

1. Competence to analyze and evaluate business opportunities and challenges.
    - Students will evaluate strategies and formulate plans to realize business opportunities.
    - Students will recognize business problems, gather and analyze relevant evidence, and reach and articulate informed solutions.
    - Students will incorporate cross-border information, risks and opportunities in decision-making.
2. Professional and interpersonal skills.
    - Students will produce professional quality business documents, deliver professional quality presentations, and work collaboratively.
3. Proficiency in using information technology.
    - Students will utilize current information/communication technology.
4. Expertise within an academic major.
    - Students will demonstrate an understanding of the concepts, analytical tools, and technical skills within a discipline.
5. Ability to integrate ethics into decision making.
    - Students will apply ethical frameworks to business decisions.

SAMPLE

Program Learning Outcomes for Undergraduates

Accounting Major/Program Learning Outcome:

Accountancy students will be able to analyze, communicate, and forecast the economic activity of a business.

Courses focus on analytical and problem-solving skills within the context of financial reporting, managerial decision making, and tax planning. Professional responsibility, teamwork, and communication skills are integrated throughout the curriculum.

SAMPLE

Course Learning Outcomes for Undergraduates

Upon completion of Accounting Ethics 201, the successful student will be able to (75% accuracy):

1. Understand the meaning of ethics and why ethics is important.
2. Develop an understanding of various aspects of moral reasoning.
3. Understand how moral reasoning is used for ethical decision-making.
4. Learn the tools and techniques for analyzing ethical situations and using these tools to make ethical decisions including identification of stakeholders, the issues involved, and the process for making an ethical decision.
5. Understanding the effect of ethics on corporate governance and the accounting profession.
6. Understand the legal liability issues that accountants face and the impact on professional ethics.
7. Examine the role that ethical decision-making will make in the life/work of an accountant.

Connecting LOs to Assessing Student Learning

- What do students already know?
- How can you quickly check to see if students are learning?
- What are rubrics and how can they help you teach and students learn?
- How can you develop effective test questions?
- What is self-assessment and how can it help students learn?
- What is peer assessment and how can it help students learn?

Assessing Learning Outcomes for Student Learning

1. Summative Assessments

- Test, Quizzes, Graded Course Activities
- Should be cumulative; associated with grades

2. Formative Assessments

- Face-to-face in office hours
- Emails
- Written comments on assignments
- Do you understand?
- Are there any questions?

Assessing Learning Outcomes for Student Learning

1. **Indirect Assessments**
   - Rate their knowledge, surveys, minute papers, reflections

2. **Direct Assessments**
   - Direct application of knowledge or skill in a project, experiential learning setting
   - Apply a theory, solve a problem, synthesize literature, summarize a process

Program Level Assessment Strategies

Direct Measures

- Capstone Projects
- Senior Theses
- Exhibits
- Performances
- Pass Rates on National Exams
- Licensure Scores
- Certification
- Subject Area Tests
- Student Publications
- Student Conference Presentations
- Employer Supervisor Ratings

Indirect Measures

- Student Interviews (Exit)
- Program Review Data
- Job Placement
- Alumni Surveys (1 year, 3 years, 5 years)

https://www.cte.cornell.edu/teaching-ideas/assessing-student-learning/index.html

Course Level Assessment Strategies

Direct Measures

- Test
- Paper
- Project
- Laboratory Report
- Journal
- Artistic Performance
- Homework
- Reports
- Clinical Experiences
- Research Project
- Case Study Analysis
- Theses and Dissertations
- Internship Supervisor Ratings
- Portfolios

Indirect Measures

- Course Evaluations
- Surveys
- Student self-reports
- Exit Interviews
- Job Placement
- Graduate School Admissions
- Awards
- Performance in Subsequent Courses
- Focus Groups
- Two Minute Check-up
  - Minute Paper
  - Chain notes
  - One Sentence Summary
  - Direct Paraphrasing
  - Think-Pair-Share
  - Gallery Walk
  - Roundtable

https://www.cte.cornell.edu/teaching-ideas/assessing-student-learning/index.html

Two Examples:

One-Sentence Summary

Description:	What to do with the data:	Time required:
Students summarize knowledge of a topic by constructing a single sentence that answers the questions "Who does what to whom, when, where, how, and why?" The purpose is to require students to select only the defining features of an idea.	Evaluate the quality of each summary quickly and holistically. Note whether students have identified the essential concepts of the class topic and their interrelationships. Share your observations with your students.	Prep: Low In class: Med Analysis: Med

Application Cards

Description:	What to do with the data:	Time required:
After teaching about an important theory, principle, or procedure, ask students to write down at least one real–world application for what they have just learned to determine how well they can transfer their learning.	Quickly read once through the applications and categorize them according to their quality. Pick out a broad range of examples and present them to the class.	Prep: Low In class: Low Analysis: Med

https://citl.indiana.edu/teaching-resources/assessing-student-learning/classroom-assessment-techniques/

Two Examples:

Directed Paraphrasing

Description:	What to do with the data:	Time required:
Ask students to write a layman's "translation" of something they have just learned–geared to a specified individual or audience—to assess their ability to comprehend and transfer concepts.	Categorize student responses according to characteristics you feel are important. Analyze the responses both within and across categories, noting ways you could address student needs.	Prep: Low In class: Med Analysis: Med

Chain Notes

Description:	What to do with the data:	Time required:
Students pass around an envelope on which the teacher has written one question about the class. When the envelope reaches a student he/she spends a moment to respond to the question and then places the response in the envelope.	Go through the student responses and determine the best criteria for categorizing the data with the goal of detecting response patterns. Discussing the patterns of responses with students can lead to better teaching and learning.	Prep: Low In class: Low Analysis: Low

https://citl.indiana.edu/teaching-resources/assessing-student-learning/classroom-assessment-techniques/

Minute Paper

Description:	What to do with the data:	Time required:
During the last few minutes of the class period, ask students to answer on a half–sheet of paper: "What is the most important point you learned today?"; and, "What point remains least clear to you?" The purpose is to elicit data about students' comprehension of a particular class session.	Review responses and note any useful comments. During the following class periods emphasize the issues illuminated by your students' comments.	Prep: Low In class: Low Analysis: Low

Two Examples:

Memory Matrix

Description:	What to do with the data:	Time required:
Students fill in cells of a two–dimensional diagram for which instructor has provided labels. For example, in a music course, labels might consist of periods (Baroque, Classical) by countries (Germany, France, Britain); students enter composers in cells to demonstrate their ability to remember and classify key concepts.	Tally the numbers of correct and incorrect responses in each cell. Analyze differences both between and among the cells. Look for patterns among the incorrect responses and decide what might be the cause(s).	Prep: Med In class: Med Analysis: Med

https://citl.indiana.edu/teaching-resources/assessing-student-learning/classroom-assessment-techniques/

Two Examples:

Student-Generated Test Questions

Description:	What to do with the data:	Time required:
Allow students to write test questions and model answers for specified topics, in a format consistent with course exams. This will give students the opportunity to evaluate the course topics, reflect on what they understand, and what are good test items.	Make a rough tally of the questions your students propose and the topics that they cover. Evaluate the questions and use the goods ones as prompts for discussion. You may also want to revise the questions and use them on the upcoming exam.	Prep: Med In class: High Analysis: High (may be homework)

Exam Evaluations

Description:	What to do with the data:	Time required:
Select a type of test that you are likely to give more than once or that has a significant impact on student performance. Create a few questions that evaluate the quality of the test. Add these questions to the exam or administer a separate, follow–up evaluation.	Try to distinguish student comments that address the fairness of your grading from those that address the fairness of the test as an assessment instrument. Respond to the general ideas represented by student comments.	Prep: Low In class: Low Analysis: Med

https://citl.indiana.edu/teaching-resources/assessing-student-learning/classroom-assessment-techniques/

ASSESSMENT PLAN FOR THE UNDERGRADUATE MAJOR IN ANTHROPOLOGY

Example:

Department of Anthropology
University of Georgia

UG Program of Anthropology Learning Outcomes

At the time of graduation, students majoring in anthropology should be able to:

1. Articulate knowledge of the breadth of anthropology, including its main subfields, and its ties to other sciences and the humanities.

2. Demonstrate knowledge of the range of past and present human biocultural systems, including ecological relationships, subsistence, social organization, and belief systems.

3. Explain and appropriately apply evolutionary theory to human and nonhuman primate biological phenomena; this should include ability to summarize the basic time-line and processes of general primate and specific hominid biological evolution.

4. Formulate a critical, scientific understanding of the basis for contemporary human variation, both ethnic/cultural and biological, including appreciation of related ethical concerns.

5. Express ability to think holistically and comparatively in describing human ways of life, including the use of non-ethnocentric methods.

6. Demonstrate anthropological skills applicable to solutions to present-day concerns, both in the United States and in other societies.

UG Program of Anthropology Assessment Methods

The procedure for assessing achievement of our learning outcomes will utilize five methods – three direct and two indirect. These are:

1. Exit Exam.

All senior majors will take a comprehensive exam at the beginning of their required capstone course (see below). This exam will contribute to assessment of the more "substantive" or content-related learning outcomes, most specifically Learning Outcomes 1, 2, 3, and 4. The exams will be graded and students given feedback as to their performance. They will also be given the opportunity to read from a recommended literature in their areas of weakness and retake the exam at the conclusion of the capstone course.

2. Portfolio.

All majors will be required to assemble a portfolio composed of materials from their "core" course work. These portfolios will be submitted during the capstone course in their senior year (see below). As a minimum, each student must submit written materials from their three "core" courses: one in cultural anthropology, one in biological anthropology, and one in archaeology. These materials will be appropriate to each of the courses and may include term papers, papers produced at the completion of a research project, annotated bibliographies, essays, etc. Faculty teaching the courses which students designate as their "core" course in a subfield will work with the students to insure that these written materials incorporate the potential to demonstrate their achievement of the Learning Outcomes appropriate to the course.

3. Capstone Course.

All anthropology majors will be required to take this course during their senior year. The course will function in several ways to provide a mechanism for assessing the degree program. It will also provide a unique experience for the senior majors and present them with a series of activities designed to enhance their knowledge and appreciation of anthropology and prepare them for entry into a graduate program or a career.

During this course, students will:

- Take the **Exit Exam** and receive feedback (as described above).
- Assemble, submit, and critically examine their accumulated **Portfolio**.
- Interact with faculty in discussions/debates centered on current issues in anthropology, cutting-edge research in anthropology, ethical dilemmas in contemporary anthropology, application of anthropology to present-day concerns, etc. Following on these, the students will produce a series of **reflective essays** designed to demonstrate their proficiency in a number of the Learning Outcomes (most specifically Learning Outcomes 1, 4, 5, and 6). These essays become part of the student's **Portfolio**.
- Participate in the **"focus discussions"** about their experiences during their degree program.
- Receive guidance with regard to graduate education and careers in anthropology. This will include instruction in basic professional skills such as **preparation of a resume.**

4. Focus Group Discussions.

Students will complete a **questionnaire** (anonymously) and participate in structured discussions about the anthropology degree program during the capstone course (Outcome 4,5, 6). The course instructor will produce a written summary of the discussions.

5. Alumni Survey.

Anthropology alumni are currently being asked to complete a questionnaire which assesses whether they have entered a graduate program or a career; if employed, whether their education as an anthropology major is of value in their current position and how; whether the major has contributed in significant ways to their current endeavors; etc. This method will be expanded and alumni will be asked to complete these questionnaires at one year, three years, and five years post graduation.

PLAN for ANALYSIS OF DATA & PROGRAM ASSESSMENT

Who? The **department's Undergraduate Committee (rotating faculty membership)** will be charged with evaluation of a **representative sample** of the data accumulated from the methods described in the listing of Assessment Methods. The Undergraduate Advisor (chair of the committee) will produce a summary of the findings of the committee and their suggestions as to how perceived weaknesses could be addressed.

What? **This committee will review the results of the Exit Exam, including evaluation of subcategories of the results specific to particular Learning Outcomes**. Their evaluation will include an overall assessment (based on an average of the overall performance of all students taking the exam), as well as identification of any specific weaknesses related to particular Learning Outcomes and provide a report to the Dean.

How? **Student portfolios will be examined and evaluated with respect to the Learning Outcomes** designated by faculty teaching the "core" courses represented in the student's accumulated work for those courses (including the capstone course). For each portfolio, a score on a 5-point scale (1=Poor, 2=Fair, 3=Good, 4=Very Good, and 5=Excellent) will be recorded for each of the particular Learning Outcomes assessable through that student's portfolio contents. After evaluation of all portfolios in the sample, an average score will be given for each represented Learning Outcome.

How? **The committee will review the questionnaires (submitted by seniors and alumni) and the summarized focus group discus[illegible] to assess the overall program in terms of perceived strengths, weaknesses, and contributions to future endeavors.**

Final Stage UG Department of Anthropology Assessment

1. After review of data from the five assessment methods, the committee will determine to what degree each of our Learning Outcomes are being achieved by our majors.

2. The direct methods (Exit Exam, Portfolio, Capstone Course) will provide specific measures of the Learning Outcomes.

3. The indirect methods (Focus Group Discussions and Questionnaires) will permit assessment of student and alumni perceptions of the program, and the degree to which the program prepares majors for pursuit of graduate degrees or careers.

4. The report to the faculty by the committee will specifically assess each of the Learning Outcomes; if the accumulated data indicate good to excellent performance for a Learning Outcome, this will indicate that the Learning Outcome is being successfully achieved by our majors.

Final Stage UG Department of Anthropology Assessment

5. **If the data do not indicated an acceptable level of attainment of a Learning Outcome,** the materials will be examined in depth to attempt to assess whether this result is a function of our methods of assessment, or a legitimate deficiency. There will also be a general evaluation of our methods of assessment and suggestions for changes or refinements will be formulated.

6. The report of the committee will be presented to the faculty and discussed at an annual meeting explicitly focused on evaluation of the results. **Faculty will then be charged with developing modifications to the program, where the data clearly indicate failure in meeting the Learning Outcomes.** The faculty will also consider committee input on the effectiveness of our assessment procedures and develop improvements in these procedures where warranted.

How do you get there?

Curriculum Mapping

Assessment Matrix

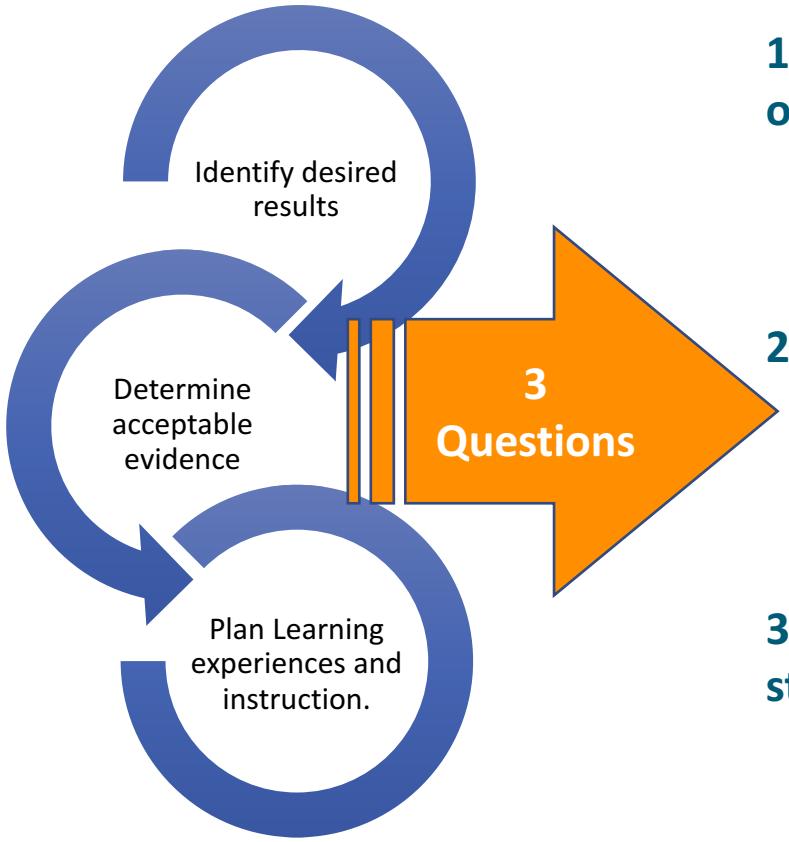
Why MAP?

- Revels Gaps in Curriculum
- Improves Curriculum
- Efficiently Utilize Resources

Reactions to Developing LO's & Assessment

- Denial
- Why are we doing this?
- What is broken?
- FEAR: Lot of time and work
- Forced upon us…

Backward Design



1. What should students hear, read, view, explore or otherwise encounter?

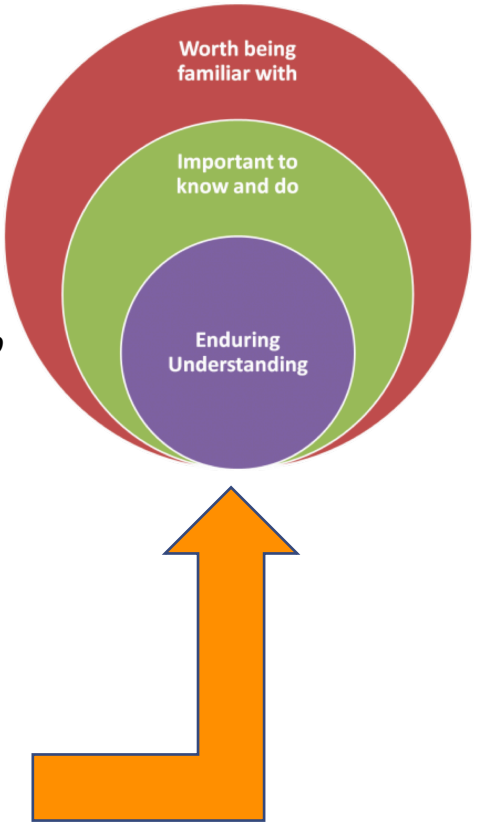
This knowledge is considered knowledge worth being familiar with. Information that fits within this question is the lowest priority content information that will be mentioned in the lesson, unit, or course.

2. What knowledge and skills should students master?

The knowledge and skills at this sub-stage are considered important to know and do. The information that fits within this question could be the facts, concepts, principles, processes, strategies, and methods students should know when they leave the course.

3. What are big ideas and important understandings students should retain?

The big ideas and important understandings are referred to as enduring understandings because these are the ideas that instructors want students to remember sometime after they've completed the course.



https://cft.vanderbilt.edu/guides-sub-pages/understanding-by-design/;https://jaymctighe.com/resources/downloads/)

Assessment Matrix Using Program Learning Outcomes

Courses →

↓ Program LO's

	Introductory Course	Research Methods	Advanced Content Course A	Laboratory / Practicum Course	Advanced Content Course B	Advanced Content Course C	Advanced Content Course D	Capstone Course
Content								
SLO 1: Disciplinary knowledge base (models and theories)	Exam Questions		Exam Questions		Exam Questions	Exam Questions	Exam Questions	Capstone Portfolio
SLO 2: Disciplinary methods		Exam Questions		Exam Questions		Exam Questions		Capstone Portfolio
SLO 3: Disciplinary applications	Exam Questions		Exam Questions		Class Project		Term Paper	Capstone Portfolio
Critical Thinking								
SLO 4: Analysis and use of evidence		Term Paper		Lab Paper	Class Presentation		Term Paper	Capstone Portfolio
SLO 5: Evaluation, selection, and use of sources of information	Annotated Bibliography	Term Paper		Lab Paper		Term Paper		Capstone Portfolio
Communication								
SLO 6: Written communication skills	Reflection Essays			Lab Paper		Term Paper	Term Paper	Capstone Portfolio
SLO 7: Oral communication skills			Class Presentation	Poster Session	Class Presentation	Class Presentation		
Integrity / Values								
SLO 8: Disciplinary ethical standards		Reflective Paper		IRB/ACUC Proposal	Reflective Paper			Capstone Portfolio
SLO 9: Academic integrity	Class Assignments & Exams	Exams & Term Paper	Class Exams	Class Assignments & Exams	Class Assignments & Exams	Exams & Term Paper	Exams & Term Paper	Capstone Portfolio
Project Management								
SLO 10: Interpersonal and team skills			Peer Review of Team Skills		Project Client Feedback		Peer Review of Team Skills	Capstone Portfolio
SLO 11: Self-regulation and metacognitive skills	Class Assignments & Exams			Class Assignments & Exams	Class Assignments & Exams	Exams & Term Paper		Capstone Portfolio

Assessment Matrix Using Program Learning Outcomes

I = Introduced
R= Reinforced
M = Mastery
A = Assessed

REQUIRED COURSES AND EXPERIENCES	Program Level LEARNING OUTCOMES						
	Demonstrate knowledge of key historical material, theoretical perspectives, institutional practices, and legal and ethical concerns.	Analyze and identify the materials from which historical and or artistic objects are made.	Develop visual and hand skills for recognizing and analyzing materials that compose cultural objects and processes by which they have been constructed.	Develop appropriate research skills.	Analyze the conservation needs of object and identify best practices.	Illustrate research and computer skills.	Exhibit knowledge of actual museum work through personal experience.
0533-370 Intro to Museums Collecting	I, A		I	I		I	I
0533-422 Art Materials and Photography	R	I, A	R	R	I		
0533-423 Artists' Materials: Panel Paintings		R					
0533-424 Legal and Ethical Issues for Collecting Institutions	R		R, A			R	
0533-425 Display and Exhibition		R			R, A		
0533-426 Collections, Management & Museum Administrators			R				
0533-427 Fundraising, grant Writing & Marketing for Nonprofits				R,A			
0533-437 Forensic Investigation	R	R, A				R	
0533-438 Art Conservation					R		
0533-510				R		R,A	R
Internship	M	M	M	M	M	M	M,A

Final Thoughts…

Regardless of the terminology, the bottom-line is to

- develop learning outcomes to communicate what students
- are expected to know, accomplish, or be able to do and
- how students will show that course, program, college, and university goals have been met.

Final Thoughts…

No one person in the program, college or university can create these learning outcome…

1. Learning outcomes are a CAMPUS/GROUP effort.
2. Includes external review (another college on campus, college in another university, another country or group of experts).
3. Expect that there will be "financial costs" to the process.
4. The process does not end – must become part of the culture of the university, colleges, programs, courses.

Learning Outcomes indicate the level of the output of your university's efforts in providing a Quality Education

Thank You!

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Pictures: (Most are from Google Images)

- http://patimes.org/measuring-economic-success-economic-development/robinson-nov/
- https://www.commlabindia.com/resources/ebook/assessments-measure-training-outcomes.php

"how to measure learning outcomes

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