İstanbul Bilgi University Guide to Planning and Implementing Learning Outcome Assessment in Academic Programs

2017-2018

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INTRODUCTION

The purpose of this guide

The purpose of this guide is to help Istanbul Bilgi University faculty in conducting program level outcome assessment in order to find out whether the aimed program learning outcomes are achieved and to what extent they are achieved by the students in the program, and to make necessary curriculum changes based on evidence and assessment research.

Outcome assessment is a very new concept not only for İstanbul Bilgi University, but for the context of Higher Education in Turkey overall. İstanbul Bilgi University will be one of the first universities (if not first) to conduct program level outcome assessment in Turkey, and thus will lead the way to a more outcome focused and student centered education system in Turkey with systematic curriculum revision cycles based on evidence of student learning, and thus a developmental approach based on informed decision making throughout.

With this pioneering role in outcome assessment, this guide aims to guide faculty and programs in the implementation of program level outcome assessment procedures customized specifically for İstanbul Bilgi University and its unique context. This guide will be supported with trainings given to faculty on outcome assessment and with meetings to clarify concepts and procedures that need further clarification.

Accreditation and Quality Assurance

WSCUC Senior College and University Commission, BOLOGNA, and Others

İstanbul Bilgi University is pursuing WSCUC accreditation, and conducting annual outcome assessment is essential to meet WSCUC accreditation criteria. It is a way to review if we are doing what we claim we are doing regarding student learning and achieving our educational aims. We have also been involved and taken great steps further in terms of the Bologna process which also aims to promote transparency in the emerging European Higher Education Area by allowing degree programs and qualifications awarded in one country to be accepted in another.

There are certain methods and tools to self-check and assure that the program learning outcomes are indeed achieved through assessment and revision procedures, and this booklet aims to guide Istanbul Bilgi University faculty in this process.

PROGRAM LEVEL OUTCOME ASSESSMENT

With the Bologna Process and requirements, all programs at İstanbul Bilgi University have determined and published their Student Learning Outcomes for their programs, namely Program Learning Outcomes. Those outcomes represent our promise to our students and the public, officially stating that once a student graduates from a program, they will be able to achieve the program learning outcomes set for the programs they have graduated from. However, until very recently, programs had no systematic method assess whether their graduates were really achieving those outcomes and whether the determined outcomes were really the necessary competencies the student should be graduating with. Program level outcome assessment is now aiming to do all this, making program learning outcomes much more meaningful and real.

The aim of outcomes based assessment is to verify that the intended learning outcomes are achieved and to understand the level of achievement of each. How do you know if your students are achieving their learning goals? You need to collect evidence—evidence of different kinds and on different levels. Faculty members naturally gather evidence of their students' learning for most of their academic career, however using that evidence to review outcome achievement has usually not been part of a typical faculty member's life. The value of applying an assessment practice to the process is that this practice provides you with the chance to analyze the evidence gathered based on the learning goals articulated. For example, you might give an exam and specifically target open-ended questions in that exam to find out whether your students have achieved a specific learning outcome. And through the analysis of this evidence, faculty and programs can discover their students' level of outcome achievement and revise their programs and courses accordingly.

Data-collection methods for outcome assessment purposes

The process of assessing Program Learning Outcomes requires programs to find evidence of achievement of the outcomes. Evidence for program level outcome assessment typically falls into one of two categories: direct evidence and indirect evidence.

Direct evidence of student learning comes in the form of a student product or performance that can be evaluated. Indirect evidence is the perception, opinion, or attitude of students (or others) collected through surveys, focus groups, interviews etc., or data sets like grade reports and course taking patterns. All evidence is important, but indirect evidence by itself is insufficient. Direct evidence is required. Ideally, a program collects both for triangulation purposes.

Direct Evidence

Student products or behaviors are accepted as evidence of outcome achievement.

- Tests/exams aligned with learning outcomes
- Papers, reports, etc.
- Projects that integrate the expectations of multiple learning outcomes
- Problem solving scenarios
- Case studies to evaluate, analyze, complete
- Presentations / Demonstrations
- Plans, proposals, designs, etc.
- Observations, recordings, and reports of practice, clinical experiences, internships
- Technology products websites, power points, etc.
- Capstone Course Evaluation
- Portfolio Evaluation
- Pre-test/Post-test Evaluation
- Thesis Evaluation
- Videotape and Audiotape Evaluation of Performance

Indirect Evidence

Evidence is based on analysis of reported perceptions about student learning, the program, outcome achievement etc. or data sets and reports

- Surveys
- Interviews
- Focus groups
- External Reviewers
- Student Surveying and Exit Interviewing
- Alumni Surveying
- Employer Surveying
- Curriculum and Syllabus Analysis
- Grade Set Analysis
- Demographics
- Retention data
- Graduation data

Curriculum Planning and Review based on Evidence

Traditionally, curriculum planning and review was mostly seen as a faculty driven process based on what faculty thought was important and what they wanted to teach based on their assumptions and what they have been accustomed to. These beliefs were then reflected in a scope and sequence section mainly listing what will be covered each week, putting the focus merely on input. However, the approach to curriculum planning and review has shifted in the last decade to a mostly outcome

focused process. In time, the idea of curriculum changed from a static one describing the content and the sequencing of content with limited changes in time, or changes based on assumptions, to a dynamic and comprehensive process reflecting educational standards and learning outcomes, assessment procedures and teaching and training methods, and evolving in time based on needs and evidence of achievement. With the new approach, the cycle of curriculum planning starts by determining the student learning outcomes the programs want to achieve with their courses through course related activities (at the course level) and through a combination of courses (at the program level). However, what actually happens as a result of these might be different than what programs intended for in the planning stage. Faculty and program's responsibility is to investigate whether the students have achieved the intended outcomes as a result of the planned process, and make changes in the curriculum based on this investigation



A desirable cycle of curriculum review both for courses and programs can be seen below.



As can be seen in the diagram above, we start out with intended learning outcomes and assumptions on how students can achieve them. Then you have the actual delivery stage in which you instruct and assess, meanwhile you collect evidence of student achievement through assignments and exams, as well as through surveys and data. At the end you analyze the gathered evidence and data and revise your curriculum accordingly. And the cycle begins at that stage all over again.

How to Conduct Outcome Assessment at the Program Level

Outcome Assessment is a systematic and on-going process of collecting, interpreting, and acting on information relating to the goals and outcomes developed to support the institution's mission and purpose. It answers the questions: (1) What is the program trying to do? (2) How well are they doing it? And (3) How can programs improve what they are doing? Assessment begins with the articulation of outcomes.

The main path to be followed during the outcome assessment process at the program level can be summarized as below:

Getting prepared:

1. Design/Revise your Program Learning Outcomes.

2. Check alignment of Courses with Program Learning Outcomes (PLOs) by developing the curriculum map

3. Determine when/in which cycle to assess each outcome.

For each PLO to be assessed:

4. Determine Direct and Indirect Evidence to be used to conduct Program Level Outcome Assessment for the selected PLO

5. Develop a rubric for rubric guided outcome assessment.

6. Choose an appropriate sample of direct evidence representing the students' performance of the outcome to be assessed.

7. Assess the selected outcome using the rubric after norming and calibrating the rubric.

8. Report the results of the analysis of indirect and direct evidence in a report for the program outcome assessment committee meeting.

9. Discuss findings and decide on actions to be taken.

10. Revise curriculum and implement changes based on findings.

11. Repeat the assessment cycle

The steps above are explained further in the section below.

Revising Program Level Student Learning Outcomes

A Student Learning Outcome (SLO) is defined as: Particular levels of knowledge, skills, and abilities that a student has attained at the end (or as a result) of his/her engagement in a particular set of collegiate experiences (Ewell, 2001).

Learning Outcomes need to be:

- specific, observable and measurable (Not measurable: practice, find out, increase skills etc. (For more appropriate verbs you may refer to Bloom's Taxonomy: see Appendix V).
- realistic and achievable.
- clearly stated and well understood by students (make sense).
- directing the design of curriculum, pedagogy, assignments, resources, and assessment.
- visibly connected to the course elements (class sessions, assignments, readings, etc.) (Driscoll & Wood, 2007).

Learning Outcomes are not...

- descriptions of learning activities.
- descriptions of curriculum content.

Bloom's Taxonomy of Learning and Student Learning Outcomes

In 1956, Benjamin Bloom and colleagues published a framework for categorizing educational goals called the *Taxonomy of Educational Objectives*. It has since been revised and amplified many times, but the basic framework has stood the test of time and remains a powerful tool for classifying levels of intellectual behavior important in learning. The taxonomy shows us both how to scaffold learning in classrooms and how to formulate student learning outcomes at increasingly sophisticated levels. These are the six categories of cognitive activity that comprise the framework:

- **Remembering** recalling relevant terminology, specific facts, or different procedures related to information and/or course topics. At this level, a student can remember something, but may not really understand it.
- **Understanding** the ability to grasp the meaning of information (facts, definitions, concepts, etc.) that has been presented.
- **Applying** being able to use previously learned information in different situations or in problem solving.
- Analyzing the ability to break information down into its component parts. Analysis also
 refers to the process of examining information in order to make conclusions regarding cause
 and effect, interpreting motives, making inferences, or finding evidence to support
 statements/arguments.
- **Evaluating** being able to judge the value of information and/or sources of information based on personal values or opinions.
- **Creating** the ability to creatively or uniquely apply prior knowledge and/or skills to produce new and original thoughts, ideas, processes, etc. At this level, students are involved in creating their own thoughts and ideas.

Below are verbs that can be used when writing student learning outcomes for different levels of learning as described above. Please note that the same verbs can be used at different levels depending on the complexity of the outcome defined. Also, the list below is just a starting point to give you an idea, please do not feel limited to the list below.

Remember	Understand	Application	Analysis	Evaluation	Creating
сору	associate	apply	advertise	appraise	adapt
define	cite	change	analyze	appraise	arrange
describe	classify	choose	appraise	argue	assemble
duplicate	classify	complete	calculate	assess	compile
examine	compare	compute	calculate	choose	compose
Identify	contrast	construct	categorize	compare	construct
indicate	convert	construct	compare	contrast	create
know	demonstrate	demonstrate	Conclude	criticize	design
label	describe	determine	contrast	decide	facilitate
list	differentiate	develop	criticize	defend	formulate
list	discuss	discover	debate	estimate	manage
locate	distinguish	dramatize	determine	evaluate	modify
match	explain	employ	diagram	grade	organize
memorize	express	establish	differentiate	judge	perform
name	extent	examine	distinguish	measure	prepare
recall	infer	experiment	examine	rate	produce
recognize	interpret	explain	experiment	revise	propose
record	identify	give examples	inspect	score	set-up
relate	locate	interpret	inventory	select	write
repeat	paraphrase	illustrate	question	summarize	
reproduce	recognize	interpret	relate	value	
retell	relate	investigate	solve		
select	report	manipulate			
state	report	operate			
underline	research	organize			
	restate	practice			
	review	predict			
	rewrite	prepare			
	show	produce			
	suggest	relate			
	summarize	report			
	tell	show			
		sketch			
		solve			
		translate			
		use			

Number of Key Program Learning Outcomes

The number of Key Program Learning Outcomes should be 7 in order to be able to assess them effectively and in time. Initially at BİLGİ we started with a much larger number of outcomes, however with the revision period, programs will not only work on the scope and wording of the outcomes but will also identify which of the outcomes are key outcomes and which are supplementary outcomes supporting the key outcomes. Supplementary outcomes should focus more on general skills and competencies. Key learning outcomes need to be distinctive to the program and should focus more on knowledge and field related skills and competencies.

Learning Outcome Checklist
The outcome has an action verb and starts with "Graduates of the program will be able
to"
All outcomes are observable and measurable (One should be able to describe ways to assess the outcomes by looking at the statement).
The outcome is reached as a result of the course/program or work/study.
The statements focus on the outcomes and what the learner does, not curricular input
or what the instructor does.
The maximum number of Key Learning Outcomes is 7.
The outcome is clear to the reader.

Program Level Learning Outcomes (PLOs) vs Course Level Learning Outcomes (CLOs)

Course Level Student Learning Outcomes, as the name indicates, are more specific to the course and defines what students will be able to do once they successfully complete that specific course.

Program Level Student Learning Outcomes, on the other hand, define what they expect all their graduates to be able to do after having successfully completed all the core courses and the necessary requirements of the program. Therefore, they need to be broader and not define course level achievements but more holistic program level achievements.

Below are weaker and better examples of program learning outcomes written for two programs:

Psychology Program

Verb used does not demonstrate an action: At the end of the psychology program, students will <u>understand</u> the important systems of psychology.

Improved version: At the end of the psychology program, students will be able to articulate the assumptions, main ideas and criticisms of major schools of psychology.

Teacher Education

Too broad: At the end of the teacher education program, students will be able to teach well.

Improved version: At the end of the teacher education program, students will be able to design lesson plans making appropriate use of their knowledge of subject matter, students, curriculum goals, and curriculum standard

The rubric below is designed by WSCUC to guide you in developing, revising, and evaluating the quality of your Program Level learning Outcomes

WISC

PROGRAM LEARNING OUTCOMES

Rubric for Assessing the Quality of Academic Program Learning Outcomes

Criterion	Initial	Emerging	Developed	Highly Developed
Comprehensive List	The list of outcomes is problematic: e.g., very incomplete, overly detailed, inappropriate, disorganized. It may include only discipline-specific learning,	The list includes reasonable outcomes but does not specify expectations for the program as a whole. Relevant institution-wide learning	The list is a well-organized set of reasonable outcomes that focus on the key knowledge, skills, and values students learn in the program. It includes relevant	The list is reasonable, appropriate, and comprehensive, with clear distinctions between undergraduate and graduate expectations, if applicable. National disciplinary standards have been
	Ignoring relevant institution-wide learning. The list may confuse learning processes (e.g., doing an internship) with learning outcomes (e.g., application of theory to real- world problems).	outcomes and/or national disciplinary standards may be ignored. Distinctions between expectations for undergraduate and graduate programs may be unclear.	institution-wide outcomes (e.g., communication or critical thinking skills). Outcomes are appropriate for the level (undergraduate vs. graduate); national disciplinary standards have been considered.	considered. Faculty have agreed on explicit criteria for assessing students' level of mastery of each outcome.
Assessable	Outcome statements do not	Most of the outcomes indicate	Each outcome describes how	Outcomes describe how students can
Outcomes	identify what students can do to demonstrate learning. Statements such as "Students understand scientific method" do not specify how understanding can be demonstrated and assessed.	how students can demonstrate their learning.	students can demonstrate learning, e.g., "Graduates can write reports in APA style" or "Graduates can make original contributions to biological knowledge."	demonstrate their learning. Faculty have agreed on explicit criteria statements, such as rubrics, and have identified examples of student performance at varying levels for each outcome.
Alignment	There is no clear relationship between the outcomes and the curriculum that students experience.	Students appear to be given reasonable opportunities to develop the outcomes in the required curriculum.	The curriculum is designed to provide opportunities for students to learn and to develop increasing sophistication with respect to each outcome. This design may be summarized in a curriculum map.	Pedagogy, grading, the curriculum, relevant student support services, and co- curriculum are explicitly and intentionally aligned with each outcome. Curriculum map indicates increasing levels of proficiency.
Assessment Planning	There is no formal plan for assessing each outcome.	The program relies on short- term planning, such as selecting which outcome(s) to assess in the current year.	The program has a reasonable, multi-year assessment plan that identifies when each outcome will be assessed. The plan may explicitly include analysis and implementation of improvements.	The program has a fully-articulated, sustainable, multi-year assessment plan that describes when and how each outcome will be assessed and how improvements based on findings will be implemented. The plan is routinely examined and revised, as needed.
The Student Experience	Students know little or nothing about the overall outcomes of the program. Communication of outcomes to students, e.g. in syllabi or catalog, is spotty or nonexistent.	Students have some knowledge of program outcomes. Communication is occasional and informal, left to individual faculty or advisors.	Students have a good grasp of program outcomes. They may use them to guide their own learning. Outcomes are included in most syllabi and are readily available in the catalog, on the web page, and elsewhere.	Students are well-acquainted with program outcomes and may participate in creation and use of rubrics. They are skilled at self-assessing in relation to the outcomes and levels of performance. Program policy calls for inclusion of outcomes in all course syllabi, and they are readily available in other program documents

Aligning Outcomes

The mission, values, and Institutional Learning Outcomes are university wide shared criteria that all students are expected to achieve during their educational experience. In order to ensure that these outcomes are achieved by students, the alignment of Program Learning Outcomes to these outcomes is crucial. The course combinations and sequencing in programs should lead to Program Learning Outcomes like a mosaic creating a picture when put together in the right way, with the right combination. Each course in a curriculum should have a reason to be in the curriculum after and before certain courses to form a path for students to achieve the Program Learning Outcomes. Likewise, the Program Learning Outcomes of programs within a university should be the steps in a ladder leading to the higher goals of the university, namely the mission, values, and Institutional Learning Outcomes. Only by doing this can we claim that we have common goals for our students and that we have a plan to ensure they achieve this goal rather than the goals just being wishes and intentions for students.



The main aim of assessment is to understand whether outlined outcomes are achieved. It is a tool that provides evidence to what extent students achieve the outcomes, therefore all forms of assessment must be linked to the outcomes of the course and hence the program.

"What" is being assessed must match up with the type of assessment being used. In other words, assessing a student's ability to "do" something by implementing a multiple choice or written examination would not be suitable. A student's knowledge about a skill, and even their knowledge and understanding of how that skill could be applied can be effectively measured through traditional written examinations and assessments. However, the student's ability to actually "do" the skill will not be captured. In order to attain an effective measurement, the design of a particular assessment should be done in such a way that the student can demonstrate their ability to do or perform the skill. Therefore, the desired learning outcomes being assessed must be front and center when the assessment method is being determined.

Developing Curriculum Maps for Effective Outcome Assessment

Adapted from "Student Learning, Outcomes Assessment, and Accreditation. (n.d.)

Curricula in higher education is much more than a collection of courses that students take to complete their programs. It aims to show a developmental and scaffolded path of educational achievement. In order for higher level outcomes to be achieved, this path needs to be comprehensive, well integrated, cohesive and connected to the higher level goals. Developing matrixes/maps that identify where and how there is alignment between program outcomes and the courses enable faculty to build these connections into their curriculum and see the journey the students will take while studying in the program.

The curriculum map presents a matrix of the program student learning outcomes intersecting with the courses in the designed curriculum, which is often presented as the student would experience the courses in the curriculum. The map needs to be a shared product of the faculty members in the program rather than one person creating it according to their own assumptions and beliefs. The map matrix visually links program outcome(s) to the courses in the curriculum by indicating the different developmental levels the student will experience in developing the outcome, which depends on the emphasis of that outcome in the course (via course design). If a course or program requirement is linked to an outcome in a substantive way, the map notes the level to which achievement of the outcome is expected:

- Introduce: (I) The course or program requirement *introduces* a concept relevant to the program outcome; learning activities focus on basic knowledge and skills that support the learning outcome. Often, several courses in a curriculum will introduce an outcome and provide practice and scaffolding to lay a foundation of achievement. Similarly, some courses may be designed to introduce only one outcome.
- **Develop: (D)** The course or requirement strengthens, supports and reinforces the *development* of the knowledge and skills necessary for optimal achievement of the program outcome further along the curriculum. Foundational knowledge of the outcome was previously introduced through other course work in the curriculum.
- **Mastery: (M)** The course or requirement emphasizes opportunities for the student to integrate all the knowledge, skills and attitudes necessary for *mastery* of the outcome at the end of the program. Instructional and learning activities in the course focus on demonstrating achievement of the outcome in multiple contexts and at multiple levels of complexity. The outcome had been previously introduced and reinforced through various activities and opportunities in other courses in the curriculum.

The curriculum map is an extremely useful tool because it helps faculty to:

- identify where outcomes are addressed in a curriculum;
- identify potential gaps in the curriculum (where a course is not addressing any outcome, or an outcome is not developed by any courses within the curriculum);
- identify whether the outcomes need modification;
- identify best opportunities for assessment; and/or
- locate potential changes for improving the curriculum.

Sample Curriculum Map									
PLO is Not related= N to the PLO, I = Introduced with the course, D = Developed & Practiced with									
Feedback, M = Demonstrated at the Mastery Level Appropriate for Graduation.									
Program:	ogram: PLO1 PLO2 PLO3 PLO4 PLO5 PLO6 PLO7								
Program									
Coordinator									
Course	I	I	N	N	N	I	N		
Code/Name									
Course	N	N	Ν	I	N	N	I		
Code/Name									
Code/Name	I I	N	Ν	Ν	I	N	D		
Course									
Code/Name	D	D	I	N	N	D	N		
Course Code/Name	D	N	D	D	Ν	Ν	Ν		
Course Code/Name	N	N	N	Ν	D	Ν	D		
Course Code/Name	D	N	D	D	Ν	Ν	Ν		
Course Code/Name	N	м	N	М	М	Ν	D		
Course Code/Name	м	N	М	N	Ν	М	М		
Elective Group Name	D	N	N	N	D	D	I		

Five Basic Steps on How to Prepare a Curriculum Map in a Table:

1. List the key program learning outcomes (PLOs) indicating their numbers as stated in CDC across the top of the table.

2. List all of the core courses except History and Turkish and elective groups except General Education Electives and Full List Electives on the vertical axis of the table.

3. **Course/PLO Relation Mastery Level** is to identify whether there is a scaffold and gradual/staged improvement for students to achieve given PLOs. Each course is mapped with PLOs in terms of whether the PLO is **Not related= N** to the PLO, **I = Introduced** with the course, **D = Developed** & Practiced with Feedback, **M =** Demonstrated at the **Mastery** Level Appropriate for Graduation.

Selection of Evidence

Once you have successfully developed program learning outcomes and have mapped the alignment of courses to the outcomes, the next step is to determine how to measure them. Selecting appropriate means for assessment is a very important step in the outcome assessment process.

At this stage, in order to provide direct evidence, you need to decide on what could be considered evidence of student achievement of the assessed program learning outcome. This could be a senior project course that all students are taking before they graduate, a part of a paper that aligns with the performance described in the learning outcome, videos of student performance representing the assessed program learning outcome etc. And likewise you need to determine what indirect evidence to choose, evidence that can add to the findings of the indirect evidence analysis and that in some ways will give you information about the student's achievement of the assessed program learning outcomes.

In this section below, you will find ideas for direct and indirect evidence to be used for outcome assessment purposes.

Sample Direct Measures of Assessment to Choose from

WSCUC requires the use of direct measures of learning for outcome assessment. Here are some outcome assessments to choose from for Program Level Outcome Assessment.

Capstone Projects:

As explained in Capstone Project Definition (2013), Capstone projects are culminating research projects that provide information about how students integrate, synthesize and transfer learning. "While similar in some ways to a college thesis, capstone projects may take a wide variety of forms, but most are long-term investigative projects that culminate in a final product, presentation, or performance. For example, students may be asked to select a topic, profession, or social problem that interests them, conduct research on the subject, maintain a portfolio of findings or results, create a final product demonstrating their learning acquisition or conclusions (a paper, short film, or multimedia presentation, for example), and give an oral presentation on the project to a panel of teachers, experts, and community members who collectively evaluate its quality." Capstone Projects would make perfect direct evidence for outcome assessment purposes since they are very comprehensive and probably one such project would demonstrate the achievement of more than one PLO.

Projects or Graduation Thesis:

Many programs here at İstanbul Bilgi University have project or thesis courses that all students have to take and be successful in before they graduate. These courses require students to demonstrate what they have learned throughout their studies here, and thus would make perfect evidence samples for outcome assessment purposes. Make sure that the content and the requirements of the project and thesis you assign to align with the PLOs, so that you can use them to assess PLOs at the end.

Course Embedded Assessment

These are assessment procedures and tasks that are embedded into the courses in the specified program curriculum. These are simply the assignments, exams, tasks we assign students within our courses. They could come in many forms like exam questions or projects, take-home or in-class assignments etc. Such embedded assignments from courses that represent mastery of certain PLOs within the curriculum map could be used for outcome assessment purposes of those PLOs.

Portfolio Assessment

This is the collection of student work over time that is used to demonstrate growth or achievement. Portfolios are good resources for outcome assessment as it gives faculty a variety to choose from and a compilation of work representing the achievement of different learning outcomes.

Practicum/Internship/Fieldwork

It is usually harder to collect direct evidence of outcome achievement through these methods since they are works in action and the instructor is usually not there when the students demonstrate their abilities. The grades for such work are usually based on the student's self-evaluation reports or the supervisor's reports about the students. These reports mirror perceptions and do not always reflect actual performance. However, there are ways to collect direct evidence from these, as well through online portfolios where students post their performances, work, recordings to represent samples of what they did during their Practicum/Internship/Fieldwork, or reports including evidence of work completed as well.

Standardized Instruments

These are instruments developed outside the institution with standardized administration and scoring procedures and frequently with time restrictions. We do not really recommend the use of such instruments to serve for outcome assessment unless there is a specific reason for its use. Assessment developed locally by the instructors usually are much more meaningful and link much better to the aimed learning outcomes.

Some sample indirect measures of assessment to choose from (adapted from "Common Types of Evidence, University of Manoa Assessment Office". 2016):

Student Surveys

Surveys are given to students for them to compose a self-report about their ability, attitudes, and/or satisfaction, e.g. students answer questions about their perception of how much they can perform the student learning outcomes they were asked to achieve.

Course Evaluations

Students report their perceptions about the quality of a course, its instructor, and the classroom environment etc.

Focus Group Meetings with students

Structured or semi-structured face-to-face, one-to-many discussions or question/answer sessions with students.

Interviews with students

Structured or semi-structured face-to-face, one-to-one discussions or question/answer sessions.

Alumni surveys

Alumni surveys are used so that graduates report their perceptions about pre-determined aspects of the program through a questionnaire

Employer surveys

Potential or real employers complete a survey in which they indicate the job skills they perceive are important for college graduates or through which they report their perceptions of our alumni's skills and any other determined aspect related to the program.

Note: if the survey asks employers to directly evaluate the skills, knowledge, and values of new employees who graduated from BİLGİ, the survey can also be considered a direct method of evaluating students.

Sample descriptive data sets as measures of assessment to choose from

Grades set data

Student grades given by faculty.

Grade point averages or grades of students in a program.

E.g., 37% of the students in the Introductory Communication Skills course received an "A," "A+" or "A-" grade.

Workload data

Students' self-reports or observations made on time spent on, for example:

- co-curricular activities;
- homework;
- classroom active learning activities verses classroom lectures;
- intellectual activities related to a student learning outcome;
- cultural activities related to a student learning outcome.

Job placement data

The percent of students who found employment in a field related to the major/program within a given time.

Enrollment in higher degree programs

The number or percent of students who pursued a higher degree in the field.

Curriculum Maps/Outcome Matrices

Analysis of Curriculum Maps/Outcome Matrices of the required curriculum and instructional practices.

Transcript analysis or course-taking patterns

The actual sequence of courses (instead of the program's desired course sequence for students).

Syllabi/CDC data

Analysis of syllabi/CDC data for the course in the program

Institutional Research Data

Analysis of data such as:

- Registration or course enrollment data;
- Class size data;
- Graduation rates;
- Retention rates;
- Grade point averages.

Sampling of Evidence

- Decide whether you will use a sample or the whole population.
- Choose an appropriate sample size based on percentage, artifact size and complexity.
- Choose an appropriate sampling method (As long as it is explained, any method that is appropriate to the program is acceptable).

Things to consider when sampling for direct evidence

<u>Length and complexity of the assignments</u>: If the assignment or artifact is of a capstone level (e.g. research project), then a smaller percentage of students might be chosen.

<u>The number of students enrolled in the course or program</u>: If your course or program has less than 100 students, then you should consider using a larger percentage or the entire population. A common standard for sampling is 10% or 25 artifacts, whichever is greater.

<u>The number of faculty members serving on the faculty committee:</u> If the program has only three faculty members on the faculty committee, then a smaller sample size would be more appropriate depending on the complexity of the assignment. However, programs with many faculty members and short assignments could have a much larger sample size since there are many more people available to evaluate the artifacts.

Sampling Types

Simple Random Sampling: You randomly select a certain number of students or artifacts.

<u>Stratified Sampling</u>: Students are sorted into homogenous groups and then a random sample is selected from each group. This is useful when there are groups that may be underrepresented.

Systematic Sampling: You select the nth (e.g. 7th, 9th, 20th) student or artifact from a list.

<u>Cluster Sampling</u>: You randomly select clusters or groups (e.g. classes or sections), and you evaluate the assignments of all the students in those randomly selected clusters or groups.

Develop Rubric/Criteria for Assessment of Subjective Direct Evidence

What is a Rubric

A rubric is a learning and assessment tool that articulates the expectations for outcomes, assignments and performance tasks by listing criteria, and for each criterion, describing levels of quality (Andrade, 2000; Stiggins, R., Arter, J., Chappuis, J., & Chappuis, S. (2006).

When using direct evidence like Capstone Projects, Course Embedded Assessment, Performance Assessment, or Portfolio Assessment, programs need to develop rubrics for each PLO and train their faculty involved in assessment on how to assess the evidence using the rubrics for inter-rater reliability.

A rubric is a guide used to rate or score a performance against a given set of criteria. At a basic level, the guide provides a list of components that should be looked for when an assignment is evaluated. At its most advanced, the rubric is a tool that separates an assignment into its respective parts, and details well-worded expectations and explanations of acceptable and unacceptable levels of performance for each component. It is a matrix, grid, or cross-tabulation employed with the intention of making expert judgments of student work both more systematic and more transparent to students and faculty.

Components of a Rubric

Rubrics contain four essential features (Stevens & Levi, 2013):

(1) The Title: Write the outcome to be assessed as the title of the Rubric;

(2) **A scale** (and scoring) that describes the level of mastery- the performance level (e.g., exceeds expectation, meets expectation, and does not meet expectation);

(3) **Components/dimensions** students are to attend to in completing the assignment/tasks (e.g., types of skills, knowledge, etc.); and

(4) Description of the performance quality (**performance descriptor**) of the components/dimensions at each level of mastery.

Dimensions t expected and as PLO to be Assesser related problems	o be ssessed ed: Graduates will be able to	escriptions of erformance pectations for each level of 	aims to asses name of th rubric	ss – ie f fusiness to solve	Level of Achievemen the Scale
Skill	Exemplary - 4	Prolicient - 3	Marginal - 2	Unacceptable - 1	
Define the Problem	States the problem completely and identifies all of the underlying issues.	States the problem almost completely and identifies most of the underlying issues.	States the problem less than completely and identifies a few of the underlying issues.	States the problet incompletely and very few or none underlying issues	m identifies of the
Recognize the potential causal factors	Identifies all of the potential causal factors involved in a business- related problem.	Identifies most of the potential causal factors involved in a business- related problem.	Identifies few of the potential causal factors involved in a business- related problem.	Identifies very few the potential cause involved in a busi problem.	w or none of sal factors ness-related
Develop a solution plan	Develops a complete plan to solve the problem, with many alternative strategies, and follows the plan to conclusion at the highest level.	Develops an almost complete plan to solve the problem, with some alternative strategies, and follows the plan to conclusion at an acceptable level.	Develops a less than complete plan to solve the problem, with a few alternative strategies, and follows the plan to conclusion at a minimal level.	Develops an incor to solve the probl very few or no alt strategies, and do follow the plan to	mplete plan lem, with cernative bes not o conclusion.
collect and analyze information	Collects information from multiple sources and analyzes the information in-depth at the highest level.	Collects information from adequate number of sources and analyzes the information in- depth at an acceptable level.	Collects information from less than adequate number of sources and analyzes the information in-depth at a minimal level.	Collects informati inadequate numb sources and analy information in-de unacceptable leve	ion from per of vzes the upth at an el.
Problem Solution	Solves the problem completely, offering many alternative solutions and provides a logical interpretation of the findings.	Solves the problem almost completely, offering some alternative solutions and provides a mostly logical interpretation of the findings.	Solves the problem less than completely, offering few alternative solutions and provides a somewhat logical interpretation of the findings.	Solves the proble incompletely, offer few or no alterna solutions and lack logical interpretat findings.	m ering very tive cs overall a tion of the

Types of Rubrics

The choice of a holistic or analytical rubric depends on the questions the faculty is trying to answer.

<u>Analytical</u>

With an **analytical rubric**, the teacher scores separate, individual parts of the product or performance first, then sums the individual scores to obtain a total score (Nitko, 2001). An analytical rubric allows the assessor to pinpoint areas of weakness and maximize the effectiveness of any interventions by targeting those weaknesses. Analytical rubrics are better suited for classroom assessment as they can provide detailed feedback to students, thus are more useful with formative assessment.

Sample: Speaking Analytical Rubric

	4	Response comprehensible, requiring no interpretation				
	3	Response comprehensible, requiring minimal interpretation				
	2	Response mostly comprehensible, requiring interpretation				
Comprehensibility	1	Response barely comprehensible				
	0	Response not comprehensible				
	4	Speech continues with few pauses or stumbling				
	3	Some hesitation but manages to continue and complete thoughts				
Fluency	2	Speech choppy and/or slow with frequent pauses; sometimes difficulty in completing thoughts.				
	1	ech halting and uneven with long pauses and/or incomplete thoughts.				
	0	No fluency at all				
	4	Effective use of vocabulary with variety (within the limits of the level).				
	3	Accurate use of vocabulary without much variety.				
Vocabulary	2	Somewhat inadequate and/or inaccurate use of vocabulary.				
	1	Mostly Inadequate and/or inaccurate use of vocabulary.				
	0	Inadequate and/or inaccurate use of vocabulary.				
	4	Control of basic language structures				
	3	Emerging control of basic language structures with minor errors				
Accuracy	2	Emerging control of basic language structures with some major errors				
	1	Inadequate and/or inaccurate use of basic language structures				
	0	No control at all on basic language structures				

Holistic Rubric

A holistic rubric requires the teacher to score the overall process or product as a whole, without judging the component parts separately (Nitko, 2001). For a sample of a holistic rubric, see the rubric under the heading "Components of a Rubric in this guide.

Holistic and Analytical Rubric

This type is a mixture of Holistic and Analytical approaches to Rubric writing. It is a good combination to use for Outcome Assessment since it keeps the advantageous areas of both approaches and minimizes the overall disadvantages. The grade is still given with a holistic approach, but raters can see really what traits/qualities to look for in each dimension of the rubric.

_	Overall	A straightforward text that can be easily followed and is meaningful. The student has taken risks and tried to use a variety of studied structures and vocabulary. There may be some inconsistencies in language use because the student has taken risks.
	Range	A range of vocabulary and phrases (which have been studied) are used with rare errors. There may be rare misuse of words that the reader can still understand and interpret.
Excellen	Coherence	The ideas in the text are organized in a meaningful way. The sentences are linked together with appropriate use of common connectors in a linear sequence. The text is easy to follow.
	Accuracy	The studied structures are used mostly accurately. Minor errors do not interfere with the flow of text and do not cause misunderstandings.
	Content	All information in the text is related to the topic given and there is enough support and examples to explain opinions in the text.
	Overall	A straightforward text with partly irrelevant ideas that appear occasionally in the text and do not hinder the linear flow much. The text can mostly be followed easily but there may be some jumpiness. There is an attempt to use various structures and vocabulary items but there are some inconsistencies because the student has taken risks.
75	Range	A range of vocabulary and phrases which are studied are used with some mistakes that may occasionally cause misunderstandings.
Goor	Coherence	The sentences are linked together with the use of common connectors. Although there is minor jumpiness, the text is easily followed and the organization of ideas is mostly meaningful.
	Accuracy	Uses simple structures correctly, but sometimes makes mistakes with more complicated new learned structures. Errors cause occasional misunderstandings.
	Content	Most information in the text is related to the topic given though there are occasional less related sentences. Opinions are supported and exemplified but not always detailed enough.

Sample Writing Holistic/Analytical Rubric

How to Write a Rubric

When creating a rubric, some people like to work deductively, and some people prefer an inductive approach. In a work session, you can try a little of both. One approach that is effective is to have a dozen or so pieces of student work. You give copies to each of the participants, who work independently or in pairs, and ask them to sort the work into piles: poor, adequate, good, and very good. Then they compare their results and describe to each other the qualities in the work that caused them to sort them as they did. You can use ready rubrics as a starting point and adapt them to the program expectations using a similar method of faculty involvement.

Four suggested steps for creating a rubric (adapted from "Creating a rubric" 2016)

Step 1. Identify the learning outcome you are assessing.

E.g. Graduates will be able to apply area concepts and theories in various disciplines of business to solve business-related problems.

Tip: You can find and adapt an existing rubric written for similar outcomes.

Step 2. Identify the dimensions that you would like to assess when assessing the task/assignment/exam question/learning outcome.

For example, typical dimensions when assessing oral presentations could involve dimensions like delivery, organization, idea development, drawing appropriate conclusions and audience awareness.

Tip: While doing this, have several student samples in front of you to give you an idea of the dimensions to Assess

Step 3. Create the descriptors for each dimension of the learning outcome.

Tip: Determine the 4 categories you will use, and then develop descriptions of the best level work you would expect and the worst paper you would expect. Then describe the other 2 dimensions for each descriptor.

Step 4. Pilot test the rubric by applying it to samples of student work; then revise the rubric as needed to eliminate ambiguities. Consider asking faculty who were not involved in the development of the rubric to pilot test it for you as they may be more able to identify ambiguities in the rubric.

Helpful Adjectives and	Adverbs to describe the Quality of Performance (adapted from	"SAS®
Curriculum Pathways®"	2016)	

Poor	Needs Development	Good	Exemplary	
None	Fewer than/Some	Most	All	
Never	Seldom, rarely	Sometimes, often	Always	
Incomplete	Less than complete	Somewhat/Almost	Complete	
		complete		
Inadequate	Less than adequate	Adequate	Superior	
Unsatisfactory	Minimal	Satisfactory	Maximum	
Unclear	Vague	Understandable	Articulate	
Rarely clear	Sometimes unclear or	Often clear, often	Clear, accurate	
to an unacceptable	inaccurate	accurate		
level	to a minimal level	to an acceptable level	to the highest level	
Includes no elements	Includes few elements of	Includes most	Includes all elements	
of	Sometimes improper	elements of	of	
Unclear	Somewhat unclear	Some degree of clarity	Clear	
Inappropriate	Limited	Adequate number of	All Necessary	
Lacks enough of	Minimal amount of	Important	Significant	

How to use a Rubric for Outcome Assessment- Calibration, Rater Reliability and Actual Assessment Process

Nine steps to use a rubric for PLO Assessment (adapted from "Creating a rubric" 2016)

Step 1. Determine where in the curriculum the outcome is addressed at graduation level.

- A curriculum map will be needed to accomplish this task.
- To determine if students have achieved the outcome by the time they are about to complete the program, consider looking at senior level courses where the outcome is mastered.

Step 2. Look within the courses you have selected to identify student work (e.g., products or performances) that would demonstrate the outcome.

• Look for products produced towards the end of the program at mastery level of achievement.

Step 3. Develop the rubric.

• Create a rubric following the five steps explained in the previous section.

Step 4. Sampling student work

- Consider using a sample, or representative portion, of the student work that is available for the selected work product instead of including the work of every student who submits the assignment.
- A representative sample will give you a good understanding of student learning in your program, and require less time and effort to evaluate.

Step 5. Calibration

<u>Reason</u>

- To produce dependable scores, each faculty member needs to interpret the rubric in the same way.
- The process of training faculty members to apply the rubric is called "norming."
- It's a way to calibrate the faculty members so that the evaluation of the student work is consistent across the faculty.

The Process

- 1. Give each scorer a copy of several student products that are exemplars of different levels of performance.
- 2. Ask each scorer to independently apply the rubric to each of these products.
- 3. Ask them to write their ratings on a scrap sheet of paper.
- 4. Collect everyone's ratings and display them so everyone can see the degree of agreement.
- 5. Guide the group in a discussion of their ratings to establish standards and reach consensus by referring to the rubric

Step 6. Apply the rubric

• More than one rater should independently apply the rubric. Then they should decide on a final score.

Step 7. Once you have applied the rubric, aggregate rubric scores across students for each outcome or skill indicated on the rubric using frequencies or mean scores.

Step 8. Present data in a way that is user-friendly for your program's faculty and then discuss what the results mean for your program.

Step 9. Making use of the results.

• It is very helpful to have a criterion or standard of success in mind when you start the discussion of results. For example, you might say that the average score must be above a 3 on a 4-point scale, or you might say that 75% of your students must fall in the 'superior' range of your rubric.

Analysis of Direct and Indirect Evidence

Once you have collected all evidence and have evaluated direct evidence with the rubric, now it is time to put the data for each evidence used in a way that is user-friendly for your program's faculty.

For rubric related results, aggregate rubric scores across students for each outcome or skill indicated on the rubric using frequencies or mean scores.

For all data collected, it is a good idea to put the data in charts, tables, etc. to make it clearer and more user friendly for anyone to be involved in the analysis and discussion of the results.

Sometimes during data analysis or discussion, a program may feel the need to take a deeper look at additional aspects of the program to make sense of the data and be able to decide what causes the problem. Such additional data can be assessment samples from specific courses, looking at grade data for a specific group of students who seem to be less successful, the course taking patterns of successful or unsuccessful students, and any such data that the program feels will make sense and clarify the findings in hand. This type of data can be provided by the Institutional Research Office upon request.

As a result of the data analysis and the discussions, the results will hopefully indicate either the areas of strength – so that you can maintain the strengths, or the areas open to improvement for better achievement of the outcome assessed and ideas on how to improve those areas.

Closing the Loop

The Program Outcome Assessment Committee analyzes the data for each evidence, discusses the results and the implications of the result. Once the faculty as a group decides what the results mean, they discuss and decide on ways to improve within the curriculum for any area of concern.

Improvements can be (but are not limited to) in the areas below:

- Sequencing of courses in the curriculum.
- Adding courses or removing courses from the curriculum.
- Changes to the content of some courses.
- Need for faculty training in certain areas.
- Need for support for specific student profile.
- Changes to classroom assessment practices.
- Changes to course delivery methods.
- Revision of Program Learning Outcomes.
- Revision to the rubric used.
- Anything that you feel will improve the student achievement of the PLO or the program overall.

INSTITUTIONAL STEPS TO BE FOLLOWED FOR PROGRAM LEVEL OUTCOME ASSESSMENT

Creating a Multiyear Program Outcome Assessment Plan

- 1. Identify Program Assessment Committee Members.
- 2. Study your curriculum map, consider how each PLO can be assessed using direct evidence of student work from different courses, indirect methods of assessment, and data provided (Triangulation if possible).
- 3. Decide on Timeline to Assess all PLOs
- Complete the "Multiyear Initial Assessment Plan for Academic Programs" document (see Appendix I)

 Timeline and methods for PLO Assessment using the Assessment Plan template. Submit Plan to the Faculty Dean.
- 5. The Dean sends the approved **Multiyear Initial Assessment Plan for Academic Programs** to the Rector's Office to be filed.

Assessment plan for each PLO to be assessed

This phase starts after the **Multiyear Initial Assessment Plan for Academic Programs** document is approved by the Faculty Dean.

- 6. Study the graduate expectations for the PLO(s) and develop rubrics for PLO assessment accordingly.
- 7. Find where the selected PLO is mastered in the curriculum map and identify student work in those courses that would represent PLO mastery.
- 8. Identify how each PLO will be assessed using rubrics (Standardization, Quality Marking etc.) and how evidence will be stored (Shared folders).
- 9. Determine available data (IR data sets) or indirect evidence (surveys, interviews etc.) that will be used in assessment (Triangulation if possible).
- 10. Complete the **Program Level Outcome Assessment Plan Template** (see Appendix II) for the PLO(s) you will assess at that stage. Submit plan to the Faculty Dean.

Implementation of Program Outcome Assessment

This phase starts after the **Program Level Outcome Assessment Plan Template** – for each PLO document is approved by the Faculty Dean

- 11. Based on the Assessment Plan approved in step 10 collect student work samples for the PLOs to be assessed according to the timeline.
- 12. By applying the assessment method explained in your plan, conduct PLO Assessment (Standardization, Quality Marking, data analysis etc.).
- 13. After completing the Assessment of each PLO, complete the **Assessment Report** (see Appendix III) for each PLO Template and Submit the Report to the Faculty Dean.
- 14. The Faculty Dean submits the approved Outcome Assessment Report to the Rector's Office.

Towards Program Review

After the assessment of each outcome, complete the **Multiyear Assessment Report for Academic Programs** (see Appendix IV) template. Once all PLOs are assessed for the program and the report is completed, you can use this document as one indicator of the program's academic quality during your program review cycle every 5-7 years (for details of the Program Review process, please see the BİLGİ Program Review Guide).

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APPENDIX I. Multiyear Initial Assessment Plan for Academic Programs

Program name: updated/submitted: Date

Program Coordinator at time of submission:

Assessment Leader at time of submission:

Underline the timeline that applies to your program assessment plan for completion of Assessment of all PLOs: **3 Year / 4 Year / 5 Year**

Program Learning Outcome	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Key PLO 1					
Key PLO 2					
Key PLO 3					
Key PLO 4					
Key PLO 5					
Key PLO 6					
Key PLO 7					

*Upon completion of this template, submit it to the Curriculum and Assessment Committee. Start working on the "Program Level Outcome Assessment Plan Template – for each PLO" once your multiyear plan is approved.

APPENDIX II. Program Level Outcome Assessment Plan Template – for each PLO

Start working on this template once your multiyear assessment plan is approved.

Use this template for each Program Learning Outcome (PLO) you assess. Complete one template for each Outcome.

Program:	
Assessment Leader for the program:	
Program Coordinator	
Assessment Committee Members	
Date updated/submitted:	
Time needed to complete the Assessment	
Process indicated in this plan	

1. In the space below, copy the program learning outcome to be assessed:

2. In the space below, copy the curriculum map or add it as an appendix.

3. Assessment Question(s) and/or Aim(s) of Assessment Activity

Given the outcome(s) being assessed, what does the program want to find out? Create a question(s) that is meaningful to faculty members in the program or to the educational effectiveness of the program/institution.

4. Direct Evidence to be used for PLO Assessment:

a) Describe what evidence will be collected from which courses referring to the map in (a).

b) In the space below, copy (or add as an appendix) the rubric to be used for evaluation of the PLO using the described evidence in (b).

c) State the expected results needed to indicate a sufficient level of achievement of outcomes based on the evaluation of direct evidence using the rubric in (c).

5. Indirect evidence to be used for PLO Assessment:

a) Describe what indirect evidence will be used for Assessment of the PLO by explaining its relevancy.

b) Describe how the indirect evidence will be analyzed (the method).

c) State the expected results needed to indicate a sufficient level of achievement of outcomes on this outcome based on evaluation of the indirect evidence.

6. Program Size and Sampling Technique

- a) State the number of students in the program or the number of latest graduates.
- b) Describe the sampling technique to be used (most programs will sample instead of collecting and evaluating evidence from every student).

7. Other areas of interest/research about the program – If applicable

- a) What other aspects would you like to review about the program within this cycle?
- b) Why?
- c) What evidence will you be analyzing?

APPENDIX III. Assessment Report for each PLO

Program	
Assessment Leader	
Program Coordinator	
Assessment Committee Members	
Date updated/submitted:	
Program Learning Outcome Assessed	

Please indicate in your responses anything you have changed since your assessment plan with the reason for the change (PLOs, Curriculum Map, evidence chosen etc.)

I. Direct Evidence

A. Description of Direct Evidence

1. What is the student asked to perform? Copy the instructions of the assessed performance if available.

2. From which course(s) is the direct evidence collected from (explain if it is not from a course in the program curriculum?

3. Explain the sampling method used.

B. Analysis of Evidence

- 1. How many assessors were involved in the assessment of the direct evidence names of the assessors.
- 2. How was calibration ensured (give details about the calibration process, the rubric used etc.).
- 3. Copy aggregated results of the assessment based on the dimensions below.

C. Result:

How would you interpret the results of the analysis of direct evidence?

II. Indirect Evidence

A. Description of In-Direct Evidence

What is the indirect evidence used? (if there is more than one type explain all). Add the indirect evidence as appendix.

B. Analysis of Evidence

Copy the aggregated results of the analysis of indirect evidence below (in a table, chart, etc.). If the results are not suitable to copy on this document, attach the results.

C. Result:

How would you interpret the results of the analysis of indirect evidence?

III. Overall Findings

1. What are your overall findings of the analysis of both direct and indirect evidence in relation to the outcome assessed?

2. Is there any other conclusion you came to in relation to the program (may not be related directly to outcome assessed) as a result of the analysis of evidence?

IV. CLOSING THE LOOP

How will the findings be used to improve the program? List the improvements planned by explaining how the planned improvements link to the findings

APPENDIX IV. Multiyear Assessment Report for Academic Programs

Program name:

Date updated/submitted:

Program Coordinator at time of submission:

Assessment Leader at time of submission:

Program Learning Outcome	2017-2018	2018-2019	2019-2020	2020-2021	Means of Assessment	How the loop will be /has been closed
					Direct Evidence	Findings:
					Indirect Evidence	Closing the Loop Actions:
					Direct Evidence	Findings:
					Indirect Evidence	Closing the Loop Actions:
					Direct Evidence	Findings:
					Indirect Evidence	Closing the Loop Actions:
					Direct Evidence	Findings:
					Indirect Evidence	Closing the Loop Actions:

Complete this table after the approval of each PLO Assessment Report. Add as many columns as necessary. Use this document during Program Review every 5-7 Years.

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APPENDIX V. Bloom's Taxonomy (taken from "A Guide to Bloom's Taxonomy", 2015)

In 1956, Benjamin Bloom (an American educational psychologist), with collaborators Max Englehart, Edward Furst, Walter Hill, and David Krathwohl, published a framework for categorizing educational goals: *Taxonomy of Educational Objectives* familiarly known as Bloom's Taxonomy. The framework consisted of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The categories after Knowledge were presented as "skills and abilities," with the understanding that knowledge was the necessary precondition for putting these skills and abilities into practice.

In 2001 Bloom's taxonomy was revised by a group of cognitive psychologists, led by Lorin Anderson (a former student of Bloom). To update the taxonomy to reflect 21st century work the authors used verbs to re-label the six categories and included "action words" to describe the cognitive processes by which learners encounter and work with knowledge.



APPENDIX VI. Resources for Rubrics

Kansas State University Assessment Office link to Value Rubrics developed by The Association of American Colleges and Universities (AAC&U) VALUE {Valid Assessment of Learning in Undergraduate Education}

https://www.k-state.edu/assessment/toolkit/measurement/valuerubrics.html

Loyola Marymount University Assessment Office Sample Rubrics

http://academics.lmu.edu/spee/officeofassessment/assessmentresources/rubrics/examplerubrics/

University of Nevada Civil Environmental Engineering PLO Assessment Rubrics

https://www.unr.edu/Documents/engineering/civil-environmental/ce-outcomes-metrics.pdf

http://web.uri.edu/assessment/uri/rubrics/

https://assessment.trinity.duke.edu/documents/DevelopingandUsingRubrics.pdf

http://iacbe.org/oa-documents.asp

http://course1.winona.edu/shatfield/air/rubrics.htm

http://manoa.hawaii.edu/assessment/resources/rubricbank.htm

http://www.uwstout.edu/soe/profdev/rubrics.cfm