Degree Program Expectations How-To Guide

Degree Program Expectations How-To

The resources provided in this document will assist you in completing the six steps for curriculum design and assessment, a narrative of which must be completed for the program's Academic Program Review, and is found in the Self-Study Report Template. For each step, the document:

- Provides a basic overview of the goals and purpose of the step,
- Offers suggestions and potential strategies for effectively completing the step, and
- Lists specific activities for units associated with the step.

The ideas and suggestions for completing the steps are intended to provide useful information for faculty and department chairs. Meaningful assessment practices are anything but a one-size-fits-all approach. For assessment to be useful, it needs to be tailored to fit each academic unit and program. **Since each academic department or school and its degree programs differ in terms of size, approach, and outlook, it is important to ensure that the assessment approach matches the needs of the program, the faculty, and students.** Staff from the Office of Curriculum, Learning Design, & Academic Assessment are available to discuss any thoughts or ideas to help programs build a learning outcomes assessment approach that fulfills NAU's assessment requirements and meets the needs of your faculty and students.

I. Degree Program Expectations and the Curriculum & Assessment Cycle

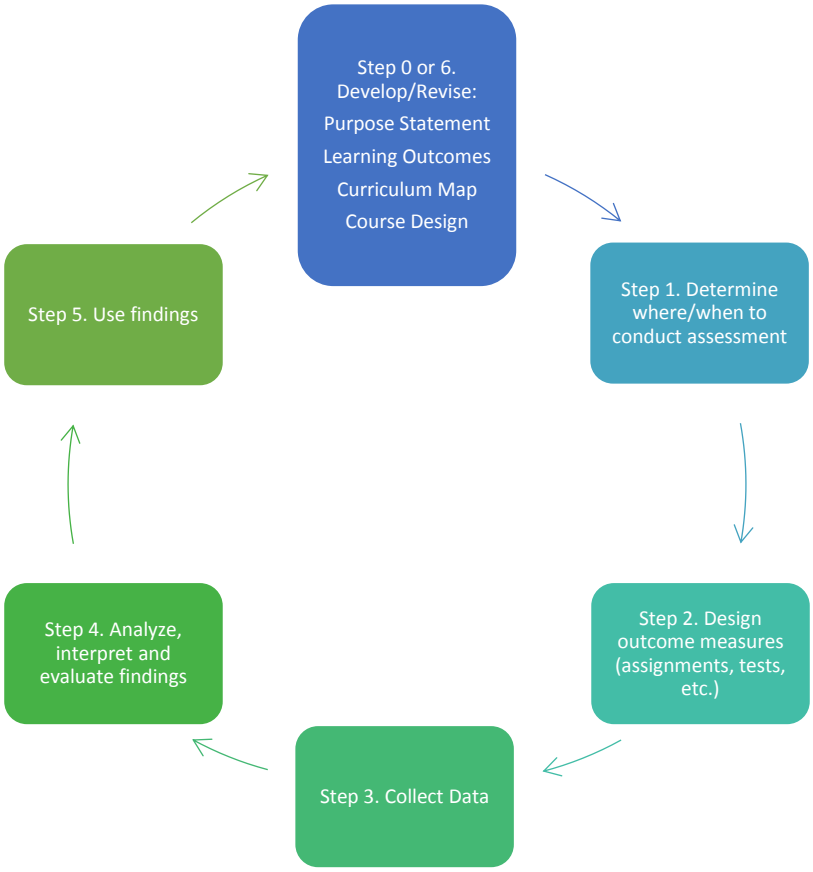
The Cyclical Nature of Learning Outcomes Assessment and NAU's Six Step Assessment Cycle

The primary goal of program learning outcomes assessment at NAU is continued improvement of the quality of education offered by NAU. Due to this approach, the process of "curriculum and assessment" is cyclical in nature. Assessment is an ongoing process that should evolve and change to inform directions for a program's curriculum as programs and students evolve and change.

There are six steps to NAU's learning outcomes assessment cycle:

1. Develop/revise the program's purpose statements, learning outcomes, curriculum map, and strategically design courses to achieve the goals and aims set forth
2. Determine where/when to conduct assessment
3. Design outcome measures (assignments, tests, etc.)
4. Collect data
5. Analyze, interpret and evaluate findings
6. Use findings: Select actions to take based on assessment findings and develop a plan to implement actions

Figure: Program Learning Outcomes Assessment Cycle



I.1. An Overview of the Purpose Statement

What is a purpose statement?

The purpose statement identifies the overall goals or aims of the degree program (or academic program), as collectively understood by the faculty members teaching in the program. The degree program purpose statement summarizes the following in a manner that differentiates it from other academic programs offered at NAU:

- The scope of the program,
- The content studied, skills developed and so on,
- The learning experiences provided, and
- The future opportunities for which it prepares students.

Graduate degree programs also address the population that is best suited for the graduate program.

Why have a purpose statement for your academic program?

Understanding and articulating your program's overall goals or aims accomplishes a number of things. Most importantly, it requires the program's faculty to come to agreement upon the purpose of learning, the boundaries of learning, and the future opportunities students will be prepared to engage in by completing their program. In turn, the identification of the overall goals and aims of the program assists faculty in making decisions program and course level learning outcomes that, if achieved, will ensure students will achieve the program's purpose. Finally, it guides and focuses your program's decision processes concerning important assessment questions and directions needing investigation, based on your program's larger aims and goals.

What is Backward Design? Why Backward Design?

"Backward Design" focuses on designing a program's curriculum by first setting the purpose and outcomes of the program, then working backward to develop approaches to instruction and course progression that will achieve the purpose and learning outcomes set for the program. In Backward Design, the purpose statement and learning outcomes create the foundation for designing a program, so that faculty can focus their selection of course requirements, assignments, teaching techniques, and other approaches toward instruction toward the end-goal: achieving the program's purpose and learning outcomes.

Backward Design is very important when developing a Purpose Statement, particularly when it comes to the future opportunities that students will be prepared for upon completion of their degree. A degree that focuses on ensuring a student has all of the skills to complete a certification exam is designed very differently from a degree that prepares students to attend graduate school or conduct research, or to a degree that is focused on ensuring students have the critical thinking, writing, and other general skills to be successful in a range of future areas. Identifying the scope, content, and future opportunities of the degree begins to define what the range of learning experiences, course sequencing, and/or learning outcomes will be necessary to ensure student success in their futures beyond NAU.

I.2. Characteristics of a Purpose Statement

The purpose statement identifies the overall goals or aims of the degree program, as collectively understood by the faculty members teaching in the degree program. The degree program purpose statement summarizes the following in a manner that differentiates it from other academic programs offered at NAU:

- The scope of the program,
- The content studied, skills developed and so on,
- The learning experiences provided, and
- The future opportunities for which it prepares students.

Graduate degree programs also address the population that is best suited for the graduate program.

The Program's Scope

"Scope" indicates the breadth of the field covered by the academic program. It identifies the aspects of the discipline, field, or area of knowledge addressed by the academic program.

An excellent example is provided by the Forensics Minor (below). What makes this particular purpose statement excellent is that it:

- Opens by clarifying what students study in the field of "Forensic Science."
- The second sentence clarifies the area of Forensic Science addressed within the "Social Sciences Forensic Minor" program, clearly describing the sub-set of knowledge covered by the minor. Note that this places clear boundaries about the approach and "type" of Forensic Science explored in the minor. This assists students to understand what they can (and can not) do with a minor in this area.
- The third sentence expounds upon the issues specifically addressed by the minor. Note how this section further clarifies the "Social Science" aspect of the minor and what it means to study Forensics from this Social Science perspective.

(1) "Forensic science" is the application of a wide spectrum of sciences and techniques that aid in detecting and solving crime, identifying individuals (victims and offenders) involved in crime, reconstructing events before, during and after the crime, and service to the courts and legal system. (2) In the Social Sciences Forensic Minor, students develop an understanding of the social, cultural, historical and political differences in the United States and globally, impacting forensic science development and its application in theory and method in criminology, criminal justice and law enforcement systems. (3) These include issues of gender, ethnicity, social inequality, and changing cultural dynamics and values affixed to human life, civil rights and criminal justice.

The Chemistry M.S. degree's scope clearly identifies that the student will focus their time energy on the development of experimental approaches in a specific field:

The Chemistry M.S. program prepares students for research-focused professions in the chemical sciences, emphasizing the development of a students' ability to develop experimental approaches that accurately capture information to solve questions and problems in their chemical field of study.

For academic programs having a great deal of breadth in their program, the "scope" can be addressed by the "content studied, skills developed, and learning experiences" of the degree. It is possible, particularly for degrees with great breadth to describe their scope through the "content studied, skills developed, and learning experiences" because it is these three aspects that create the "boundaries" of the degree, separating this program from other programs.

Here is an example from the English B.A. (The bolded section is what we would identify as addressing both the "scope" and the "content studied, skills developed, and/or the learning experience(s) provided.")

The Bachelor of Arts in English prepares graduates for any future that demands proficiency in literature, language, and writing, as well as general excellence in resourceful, well-informed communication. ***Our graduates recognize the close weave of logical thought and effective expression, strive for more persuasive or more creative uses of English, possess the sense and insight to appreciate the value and quality of literature, have developed their historical and cultural imaginations by studying the marks of other times and diverse peoples in language and text, and recognize the global contexts of English as well as the social, civic, and environmental responsibilities that come with a liberal education.*** *Our graduates have attained the high-level literacy skills and have practiced the research methods needed to compete in graduate and professional schools and to succeed in the workplace. With our help, they have prepared themselves to become productive, responsible members of the communities in which they live and work.*

A Summary of Content, Skills, Learning Experiences

The phrase "the content studied, skills developed, and/or learning experience(s) provided" ensures the purpose statement includes a summary of the essential learning outcomes and associated learning experiences that comprise the program.

The following unit successfully separated their program's scope from their discussion of content, skills, and learning experiences:

(Scope) *The Department of Psychological Sciences enables students to develop understanding and knowledge about human behavior from several perspectives in psychological science, the ability to apply and synthesize that knowledge within specific psychological domains (research and statistics, developmental processes, social and personality, cognitive and behavioral neuroscience, learning theory and behavioral health), and research method skills in order to become critical evaluators and producers of knowledge of human behavior.*

(Content, Skills, Learning Experiences) *The department's learning goals for the undergraduate major in Psychology reflect the American Psychological Association's Learning Goals (2013) and NAU's Thematic Global Learning Outcomes. To accomplish these goals, the course of study in psychology focuses on understanding the methods, ethics, and sociocultural context of research in psychological science through coursework, associated laboratory experience, and opportunities for application. Students develop the ability to critically evaluate existing psychological knowledge, assumptions, and application in order to demonstrate literacy, proficiency, and efficacy in informational, technological, and communication (written and oral presentation) skills. The ability to engage in critical analyses of psychological ideas and scientific evidence constitutes a valuable personal asset, and is a key to success in many professions, including academic and clinical psychology, business, education, law, medicine, behavioral health, and human services. Further, our Department strives to tie our departmental goals explicitly to learning outcomes in such a way that students are aware of the skills they have developed and how these skills are relevant to their professional success. To accomplish these goals, the Department engages in timely and relevant assessment of student learning outcomes at all levels of the curriculum and uses those data for program refinement.*

A Summary of Future Opportunities

In order to incorporate concepts of "Backward Design" (designing a program's curriculum by first setting the goals of the program, then working backward to develop approaches to instruction and course progression that will achieve those goals), we encourage faculty to identify the future opportunities students will succeed in once they complete the program. In addition, students, parents and other external audiences are curious about how specific fields and areas assist them toward their future goals.

Descriptions taken from purpose statements that exemplify this characteristic are as follows:

<u>Human Resources Management Certificate</u>

> *"At the completion of the certificate, students will be able to demonstrate accurate knowledge of human resources practices, scientific findings from industrial-organizational psychology, the ability to work as part of a successful team, and should be well prepared to either pass the exam to receive the APHR certificate and create an entryway into a successful career in human resources or to be successful in graduate studies in industrial/organizational psychology."*

<u>English B.A.</u>

> *"Our graduates have attained the high-level literacy skills and have practiced the research methods needed to compete in graduate and professional schools and to succeed in the workplace. With our help, they have prepared themselves to become productive, responsible members of the communities in which they live and work."*

Electrical Engineering: B.S.E.

> *…Our rigorous curriculum will help you pursue a career designing and developing the latest smart phone, renewable energy system, and all the electronic chips, equipment and products in between that benefit people by connecting, healing, informing, entertaining, defending, and providing the essentials for life.*

Sociology B.S.

> *The Bachelor of Science in Sociology program provides students with the knowledge, skills, and abilities to enter the world of social and government services, business, industry, and organizations. The sociological perspective is essential for succeeding in today's multiethnic and multinational work force. Our sociology major stresses an awareness of social factors such as race, ethnicity, gender, age, education, and social class that both influence and are affected by social structures. This perspective is an excellent preparation for a wide variety of occupations… Students will leave this program with an ability to make sense of the shifting social world and contribute solutions to difficult social problems... Sociology graduates are critically informed, value diversity and equality, and use their knowledge of sociology to pursue careers that promote these ideals.*

Health Sciences Allied Health B.S.:

> *These programs are specifically designed for students who have completed their associate's degree in an allied health discipline from a regionally-accredited program and who have successfully obtained the related professional license… We specialize in preparing students in enhancing their careers with an understanding of the importance of leadership and inter-professional teamwork among health professionals, as well as skills to sustain personal health and well-being.*

Communication M.A.

> *The MA in Communication (with no emphasis) will be of relevance to working professionals in a variety of fields, educators, activists, and those preparing to pursue a PhD in Communication, Communication Studies, Rhetoric, or related disciplines.*

For Graduate Degrees: the Population

Students tend to enroll in graduate degrees to enhance their career progression and future professional goals. In addition, most graduate degrees have specific admissions criterion requiring previous undergraduate courses or undergraduate or professional experience.

Based on these attributes, it makes sense to identify the student populations who would benefit most from the degree. This allows students to easily identify whether they have the qualifications for a program, and whether the program will prepare them for the future goals toward which they aim.

Here is a good example of two programs that appear similar from their names, but which the faculty designed for different populations:

Science Teaching M.S.

MAT is a challenging Master's program that prepares science teachers for teaching in grades 7-12 and emphasizes the development of a teacher's ability to develop research-based teaching strategies that make science accessible to learners. Specific attention is directed at the interaction of schools, learners, pedagogy, subject matter and curriculum. The program is unique in that it focuses solely on science education. This allows you to be in a supportive cohort of high-achieving science peers taught by faculty who specialize and conduct research in science education. We strive to provide a cutting-edge, high-quality program that will utilize and build upon your science knowledge and experiences to become an innovative middle or high school teacher. The program is designed for students with strong undergraduate preparation in the sciences seeking certification to teach biology, chemistry, physics, earth science, or general sciences at the secondary (middle and high school) level.

Master of Arts in Teaching Science

The MA degree is designed to meet your needs as a professional science educator. The program can be taken on the Flagstaff campus or synchronous online through video conferencing. Whether you want to increase your knowledge of pedagogy or science content in order to improve your practice or you are interested in becoming a leader in your school or district, we are here to help you.

The MAST degree is designed for:

- *Licensed secondary (middle or high school) science teachers pursuing advanced knowledge in the profession.*
- *Secondary science teachers preparing for leadership roles such as secondary curriculum, instruction or professional development specialists, department heads, etc.*
- *International science educators interested in extending their knowledge and skills through engaging in the American school system.*

While many MA students continue to work during the program, it is possible to complete the program as a full-time, on-campus student. This allows you to take a greater variety of science content courses and provides the opportunity to engage with faculty on science education research projects. Competitive graduate assistantships are available to mitigate tuition costs and provide a monthly stipend (see the funding section below). We would highly recommend this option for incoming international students.

I.3. How-to Develop a Purpose Statement

Approach #1: Have open discussions with department faculty on one of the following topics or similar topics

- Describe the ideal student in your program at various phases throughout your program. Be concrete and focus on those strengths, skills, and values that you feel are the result of, or at least supported and nurtured by, the program experience. Then ask:
    - What does this student know?
    - What can this student do?
    - What does this student care about?
    - What future opportunities will this student be prepared to succeed at?
    - List and briefly describe the program experiences that contribute most to the development of the ideal student.
- List the achievements you implicitly expect of graduates in each major field.
- Describe your alumni in terms of such achievements as career accomplishments, lifestyles, citizenship activities, and aesthetic and intellectual involvement.

Approach #2: Review and react to purpose statement of other programs that are similar but from other institutions.

- Try grouping the statements into broad categories of student outcomes (e.g., knowledge, attitudes, behavior).

Approach #3: Collect and review documents that describe your department and its programs

- Academic Catalog Descriptions
- Accreditation reports
- Curriculum committee reports
- Mission statements

adapted from the Ball State University, Assessment Workbook *(1999).*

II. Degree Program Expectation: Learning Outcomes

II.1. An Overview of Learning Outcomes

egree Program Student Learning Outcomes are statements of what students will know and be able to do (e.g., knowledge, concepts, ways of knowing, skills, values, attitudes, dispositions, etc.) upon completion of a degree program.

The primary purpose of Degree Program Student Learning Outcomes is to make teaching and learning purposeful. Learning outcomes provide a framework and a common language that both faculty and students can consistently apply to identify how a course (or even an assignment or learning experience) contributes to the purpose of the degree program.

In Backward Design, learning outcomes create a foundation for designing a program, as they identify faculty members' learning "goals" or "objectives," which we identify at NAU as "learning outcomes." By identifying learning outcomes, faculty can then work backwards to develop approaches to instruction and course progression that will achieve their stated learning outcomes for the degree program.

Overall, when creating learning outcomes, the faculty want to translate the disciplinary concepts and skills of the expert (the faculty members) in a manner that is understood by a "novice," who may be the student, or other audience, that is unfamiliar with the field or area.

Effective outcomes facilitate student learning because they build the foundation for the degree program's curriculum. When used in curriculum design, degree program student learning outcomes:

- Establish the learning priorities of the degree program;
- Communicate a unified vision of what faculty intend students will be able to achieve upon completion of the degree program;
- Tie together learning opportunities within and across courses; and
- Communicate how experiences contribute to and build learning throughout the students' degree program.

Establishing learning outcomes in an academic program guides faculty to teach collectively toward the same goals. In this manner, faculty can use the degree program student learning outcomes to guide the design of their curriculum to achieve faculty-driven learning priorities.

II.2. Characteristics of Learning Outcomes

Degree program student learning outcomes define the scope (breadth and depth) of what students will know, be able to do, etc., upon completion of the degree program. Degree program student learning outcomes:

- Are explicit;
- Are learning-centered (focus on what students learn rather than on what faculty teach);
- Align with the degree program purpose;
- Are appropriate to the level of the degree offered (Master's degree outcomes would be more rigorous and comprehensive than Bachelor's degree outcomes, etc.); and
- If a degree program has emphases, the outcomes capture the learning associated with both the common and unique curricular requirements of the degree.

What does it mean for an outcome to be "explicit?"

The primary reason for requesting outcomes to be "explicit" is to ensure outcomes provide enough clarity to support faculty in:

a. the design of the degree program and
b. the design of meaningful assessment measures.

The reason faculty would develop learning outcomes in a group is to conduct the crucial conversations about the concepts and skills that faculty will prioritize when they teach their courses for the program. Conversations assist faculty to ensure they collectively agree upon what the most important learning outcomes are for the program. These conversations lay the foundation for the development of courses designed by faculty to achieve faculty-driven learning priorities.

Two common approaches used by NAU faculty to ensure outcomes are explicit include:

1. Integration: Integrating the content, skills and, where possible, purpose of the discipline into a single outcome, or
2. Defining through sub-outcomes: Developing a broad outcome that is made explicit through clarifying "sub-outcomes."

The first approach, "integration," focuses on combining content or knowledge with the disciplinary skills used to apply that knowledge. In the table below, you will find examples that demonstrate the differences among outcomes missing one or more of the important contextual elements, and outcomes providing no context.

Needs Improvement-lack context and are not explicit. In fact, most could be an outcome for ANY degree program.	**Satisfactory—these are good outcomes. The context could be expanded upon to make them exemplary.**	**Exemplary—What makes these outcomes exemplary is the context that is provided. Students know exactly how they will apply what they will learn. Faculty know exactly how to develop curriculum and assignments to achieve the outcome.**
Demonstrate quantitative reasoning *Which degree program does this apply to, how does this apply to the context of the learner, and how is the learner going to use this vague ability in the real world?*	Use statistical data to make effective decisions in business *What types of statistics, for what types of decisions, for what types of business goals?*	Evaluate the effectiveness of global logistics networks, including the environmental impact of logistics activities, to develop reasoned proposals for improvement that support the strategy of the firm as well as the supply chain as a whole. *Knowledge: global logistics networks* *Knowledge: environmental impacts of logistics activities* *Skill: Evaluating the effectiveness of something* *Skill: Developing reasoned proposals for improvement* *Knowledge: the firm's strategy* *Knowledge: the supply chain*
Possesses written communication skills *Again, this could apply to any degree program, so it makes it difficult to know what type of written communication, (research reports, RFPs, informative essays, reflective*	Students will be able to describe fundamental principles of biology e.g., central dogma, diversity of life, inheritance. *This learning outcome could be improved by defining the principles of biology that are focused on in this*	Express personal experiences on concrete topics related to work, home, school, and leisure activities using all major time frames (past, present, and future) and the sentence structure and vocabulary of the culture, in order to interact with native speakers unaccustomed to dealing with non-

essays, etc.) How can an instructor select an appropriate assignment if the overall program outcome is this vague?	*program (vs. programs from other universities). This makes it difficult for faculty to tailor their teaching to develop and reinforce fundamental principles of biology. Also, is "describe" an appropriate skill for the completion of a Bachelor's Degree, or should students learn some critical thinking skills that they would apply to this knowledge?*	natives, and handle complicated or unexpected communicative tasks.

The second approach commonly used to ensure learning outcomes are "explicit" is "defining through sub-outcomes." This is where faculty state a broad learning outcome, then provide supporting descriptions of the outcome through bullet points or descriptions. The sub-bullet points or descriptions provide the context for the outcome. Here are some examples:

Sociology BS (sub-bullets)

Upon completion of the B.S. degree in Sociology, students will have demonstrated competency of the following:
3. Critical use of scientific methods to develop empirical explanations of social phenomena by:

- *Assessing perspectives and approaches best able to research a particular phenomenon;*
- *Developing research designs to discover, describe and/or analyze specific social components;*
- *Applying and utilizing qualitative and quantitative techniques as part of the research design;*
- *Demonstrating effective use of technology to retrieve data and information from databases in order to assess relevant research found in research publications and other sources; and*
- *Analyzing and evaluating data to inform the explanation of the phenomenon being studied.*

English BA (description)

4. Graduates will know about forms, designs, and genres, including appropriate traditions and histories. They will know how formal conventions, social contexts, and audience expectations affect purposes of discourses. Graduates will be able to describe and explain such things as literary and creative genres, canons, practical and professional writing formats and genres, types of rhetorical discourse, types of linguistic phenomena, or media and web formats and genres.

5. Graduates will know how social, cultural, and historical contexts affect personal expression; the reception, comprehension, or study of texts; and specific communication purposes for both writers and readers. Graduates will be conversant with English in global settings and with the increasing impact of international forces—the history and politics of cultural and linguistic diversity, of environmental sustainability, and of globalization—on the discipline of English.

Chemistry MS (sub-bullets)

Upon completion of the Chemistry M.S. degree, students will be able to:

2. Apply appropriate research methods and analysis as evidenced by skills such as:

- *Planning and carrying out a research project independently;*
- *Demonstrating the ability to be self-critical in evaluating procedures and outcomes;*
- *Taking responsibility for the success of a research project;*
- *Participating and collaborating with members of their research group and with people outside of their group; and/or*
- *Understanding the limitations of the research methods used in their work.*

"Learning-Centered" vs. "Teaching-Centered"

A learner-centered outcome shifts the focus of the outcome from what the faculty members are teaching to what a student is meant to learn.

An Overview of Teacher-centered to Learner-centered

For the past century or so, the focus of the traditional "teacher-centered" model of education has been on inputs: the credentials of faculty, the topics to be covered, the sequencing of courses, the physical resources of universities, and so forth.

Based on a great deal that has been learned about learning in the last thirty years, the traditional model is rapidly being replaced with a learner-centered model, which has its main focus on outputs: what knowledge and abilities have students actually acquired, what do they actually know, and what are they competent actually to do?

Implicit in the student-centered model is the idea that instructors are not providers of knowledge, but rather facilitators of learning. It is not enough to construct a syllabus and present information, however skillfully, to a captive audience; the job of instructors now involves creating and sustaining an effective learning environment based on a wide range of "best practices" in teaching and learning, which today's instructors are expected to learn and adopt.

The increasing focus on student learning as the central indicator of institutional excellence challenges many tacit assumptions about the respective roles of college students and faculty. As shown in the table below, the responsibilities of students and faculty and the relationships between the two models are quite different. In student-centered education, faculty bear less responsibility for being sources of knowledge, and take on more responsibility as facilitators of a broad range of learning experiences. For their part, students are called on to take on more responsibility for their own learning. Some main differences between the old model and the new model are shown in the table below.

Domain	**Teacher-centered**	**Learner-centered**
Knowledge	Transmitted by instructor	Constructed by students
Student participation	Passive	Active
Role of professor	Leader/authority	Facilitator/learning partner
Role of Assessment	Few tests/assignments—mainly for grading	Many tests/assignments—for ongoing feedback
Emphasis	Learning correct answers	Developing deeper understanding
Academic culture	Individualistic and competitive	Collaborative and supportive

Adapted from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006)

Creating "Learning-Centered" Outcomes

The following example demonstrates how to move the perspective from a teacher-centered approach, and instead, to identify what students will get out of the experience. Writing the outcome from the students' perspective provides a foundation of meaning to which learners can "fasten" the concepts and skills of your discipline.

Example of "Needs Improvement"	Example of "Exemplary"
Opportunities to become familiar with research theories and methodologies. *This approach is entirely teacher-centered, describing what the teacher will provide, not what the student will learn through this experience.*	The role of evidence and qualitative and quantitative methods in sociology, such that the student will be able to: - identify basic methodological approaches and describe the general role of methods in building sociological knowledge; - compare and contrast the basic methodological approaches for gathering data; - design a research study in an area of choice and explain why various decisions were made; and - critically assess a published research report and explain how the study could have been improved.

Below is an example identifying the difference between a program goal and a degree program student learning outcome.

Example of "Needs Improvement"	Example of "Exemplary"
Graduates will integrate quickly into the workplace or advanced education due to an emphasis on high quality teaching, advising, and mentoring. *This statement belongs in Purpose Statement of the program because it identifies what is important to faculty in delivering the degree program. It does not describe what students will learn to accomplish this ability.*	Knowledge of the technical aspects of construction and building systems, and energy conservation, as well as working knowledge of legal codes and regulations related to construction, environmental systems, and human health and safety, and the ability to apply such knowledge appropriately in specific projects. *This is the learning outcome that, if achieved, will ensure students "integrate quickly into the workplace."*

Alignment to Purpose Statement

High quality degree program student learning outcomes align with the degree program mission and purpose. The mission and purpose of the degree program defines the future activities for which the degree program is preparing students. Some programs may have multiple potential directions for their students, such as careers, graduate school, or general skills and knowledge that can be applied to a variety of futures. The degree program student learning outcomes should be a natural deeper description of the knowledge and skills (attitudes, ways of knowing, etc.) students will achieve, and through the achievement of those outcomes, they will be successful in the future potential pathways identified by the degree program.

For example, the purpose of the Secondary Education programs is to provide students all of the skills and knowledge they need to become teachers in their specific content area. Learning outcomes in Secondary Education programs encompass all of the skills and knowledge to develop curriculum, assess students' learning, and modify curriculum based on what students have learned. In addition, they include all of the knowledge of the content discipline of the degree program (e.g., English, Biology, Mathematics, etc.).

Another example is Geology. Their mission is to prepare students for three potential areas: further study in Geology, a career in Geology, or going directly into a career that may or may not be related to Geology once they complete their degree. Degrees with broader goals tend to focus more on the elements of critical thinking. Critical thinking goals show up in the Degree Program Student Learning Outcomes through clearer definitions of the types of analysis and synthesis students learn within the discipline. Examples are below:

English B.A.

Purpose	Associated Learning Outcome(s)
Our graduates have developed their historical and cultural imaginations by studying the marks of other times and diverse peoples in language and text	General Knowledge of English: - Graduates will know how social, cultural, and historical contexts affect personal expression; the reception, comprehension, or study of texts; and specific communication purposes for both writers and readers. Graduates will be conversant with English in global settings and with the increasing impact of international forces—the history and politics of cultural and linguistic diversity, of environmental sustainability, and of globalization—on the discipline of English.

Chemistry M.S.

Purpose	Associated Learning Outcomes
The Chemistry M.S. program prepares students for research-focused professions in the chemical sciences, emphasizing the development of a students' ability to develop experimental approaches that accurately capture information to solve questions and problems in their chemical field of study.	Apply appropriate research methods and analysis as evidenced by skills such as: - Planning and carrying out a research project independently; - Demonstrating the ability to be self-critical in evaluating procedures and outcomes; - Taking responsibility for the success of a research project; - Participating and collaborating with members of their research group and with people outside of their group; and/or - Understanding the limitations of the research methods used in their work.

Appropriate to the Level of the Degree Offered

Being appropriate to the level of the degree is a characteristic required in the Higher Learning Commission's (NAU's regional accreditor) core criterion "3.A.1.: Courses and programs are current and require levels of performance by students appropriate to the degree or certificate awarded."

In order to define "levels of performance appropriate to the degree" some faculty groups have turned to the Lumina Foundation's Degree Qualifications Profile (DQP), which explicitly articulates differentiated learning outcomes for Associate's, Bachelor's, and Master's degrees. A few sections that seemed to be most relevant to NAU's degree foci are copied and pasted from the Degree Qualifications Profile below. The PDF of the Degree Qualifications Profile is here: https://www.luminafoundation.org/files/resources/dqp.pdf .

What the following examples explore is the different level of learning between a Bachelor's and Master's Degree. Of course, the specific content knowledge of the discipline would need to be included in the outcomes, as well as the specific purpose of learning developed by faculty in the degree program.

	Bachelor's Degree	**Master's Degree**
Specialized Learning	• Defines and explains the structure, styles and practices of the field of study using its tools, technologies, methods and specialized terms. • Addresses a familiar but complex problem in the field of study by assembling, arranging and reformulating ideas, concepts, designs and techniques. • Frames, clarifies and evaluates a complex challenge in the field of study and one other field, using theories, tools, methods and scholarship from those fields to produce independently or collaboratively an investigative, creative or practical work illuminating that challenge. • Constructs a summative project, paper, performance or application that draws on current research, scholarship and techniques in the field of study.	• Elucidates the major theories, research methods and approaches to inquiry and schools of practice in the field of study, articulates their sources, and illustrates both their applications and their relationships to allied fields of study. • Assesses the contributions of major figures and organizations in the field of study, describes its major methodologies and practices, and illustrates them through projects, papers, exhibits or performances. • Articulates significant challenges involved in practicing the field of study, elucidates its leading edges, and explores the current limits of theory, knowledge and practice through a project that lies outside conventional boundaries.
Analytical Inquiry	• Differentiates and evaluates theories and approaches to selected complex problems within the chosen field of study and at least one other field.	• Disaggregates, reformulates and adapts principal ideas, techniques or methods at the forefront of the field of study in carrying out an essay or project.
Communi-cation Fluency	• Constructs sustained, coherent arguments, narratives or explications of issues, problems or technical issues and processes, in writing and at least one other medium, to general and specific audiences. • Conducts an inquiry relying on non-English-language sources concerning information, conditions, technologies or practices in the field of study. • Negotiates with one or more collaborators to advance an oral argument or articulate an approach to resolving a social, personal or ethical dilemma.	• Creates sustained, coherent arguments or explanations summarizing his or her work or that of collaborators in two or more media or languages for both general and specialized audiences.
Applied Learning	• Prepares and presents a project, paper, exhibit, performance or other appropriate demonstration linking knowledge or skills acquired in work, community or research activities with knowledge acquired in one or more fields of study, explains how those elements are structured, and employs appropriate citations to demonstrate the relationship of the product to literature in the field. • Negotiates a strategy for group research or performance, documents the strategy so that others may understand it, implements the strategy, and communicates the results. • Writes a design, review or illustrative application for an analysis or case study in a scientific,	• Creates a project, paper, exhibit, performance or other appropriate demonstration reflecting the integration of knowledge acquired in practicum, work, community or research activities with knowledge and skills gleaned from at least two fields of study in different segments of the curriculum and articulates the ways the two sources of knowledge influenced the result. • Designs and implements a project or performance in an out-of-class setting that requires the application of advanced knowledge gained in the field of study to a practical challenge, articulates in writing or another medium the insights gained from this experience, and assesses (with appropriate citations) approaches, scholarly

	technical, economic, business, health, education or communications context. • Completes a substantial project that evaluates a significant question in the student's field of study, including an analytic narrative of the effects of learning outside the classroom on the research or practical skills employed in executing the project.	debates or standards for professional performance applicable to the challenge.

For Programs with Emphases: Emphasis-specific Outcomes

If a degree program has emphases, the outcomes capture the learning associated with both the common and unique curricular requirements of the degree.

NAU programs have developed two approaches to address emphasis outcomes. The more common approach is to identify a set of "core" outcomes that all majors complete. These outcomes are aligned with the common course requirements of the program.

For example in Creative Media & Film, all students complete the following outcomes:

Students will apply critical and professional standards to the creation and critique of creative media and film through:

1. *Applying professional standards to the creation of stories through basic techniques of screenwriting and filmmaking;*
2. *Analyzing, writing, critiquing, and discussing the cultural, historical, and theoretical forces shaping regional, national, and international media, including works of creative media, client work, documentaries, and film; and*
3. *Developing and revising their work based on faculty and peer critiques and audience responses, culminating in final projects that may include fiction, documentary, or client-based films.*

Then, each emphasis area has a set of learning outcomes specific to the emphasis. Learning outcomes for two emphases follow:

Documentary Emphasis:

Students --will apply critical and professional standards to the creation and critique of documentary by:

- Refine their skills in shooting, sound recording, editing, and sound design in a variety of projects;
- Research, plan, produce, budget, finance, shoot, edit, and promote documentary projects;
- Apply skills of reporting—interviewing, gathering information, researching people and ideas for potential documentary stories;
- Read, write, and discuss the traditions and history of a variety of documentary stories; and
- Integrate other areas of knowledge, such as from anthropology, women and gender studies, history, and humanities, in order to research potential documentary story topics.

Media Studies

Students --will apply critical and professional standards to analysis of film and media by:

- Surveying a variety of regional, national, and international media forms;
- Acquiring and applying media literacy skills while analyzing a variety of film and other media projects;
- Examining the various forms of media creation, circulation, and consumption both locally and global;
- Investigating media consumption through an increased understanding of regional, national, and global media practice;
- Interpreting their own production, circulation and consumption of media both as a reflection of their own culture and in conversation with media users in other cultures; and

- Engaging in meaningful and productive discussion, debate, and open intellectual exchange with others about regional, national, and global media practice.

The second approach is used by Global Languages & Cultures, wherein the learning outcomes for language remain the same across languages, what changes is the language that is learned:

German emphasis	**French emphasis**
• Create with language to express meanings orally on concrete topics relating to work, school, home, and leisure activities using all major time frames (present, past, and future). They can interact with native speakers unaccustomed to dealing with non-natives, and handle complicated or unexpected communicative tasks. (Speaking skills) • Identify and use main ideas and details from connected aural discourse involving description and narration in different timeframes or aspects, and about a variety of topics beyond immediacy of the situation for communicative purposes. (Listening skills) • Identify and use main ideas and details from authentic, connected, longer, written texts involving description and narration in different formats about a variety of topics for communicative purposes. (Reading skills) • Create with language to express meanings in written form about familiar topics using the major timeframes with some control of aspect. (Writing skills) • Think critically and analytically in response to socio-cultural, historical, and linguistic issues and/or classic and contemporary literary texts related to the culture of the target language. (Critical thinking and analytical skills) • Understand the cultural, political and artistic diversity of perspectives, practices and products of the target language populations including how racial and ethnic diversity relates to those perspectives, practices and products. (Globalization - Diversity) • Recognize, investigate, and produce written and oral discourse in the target language communicating findings about historical and contemporary issues important to life in countries of the target language. • Explore how historical, political, religious and economic forces have shaped the current world system with its power inequalities and efforts to address them with a focus on the culture of the target language. (Globalization – Global Engagement)	• Create with language to express meanings orally on concrete topics relating to work, school, home, and leisure activities using all major time frames (present, past, and future). They can interact with native speakers unaccustomed to dealing with non-natives, and handle complicated or unexpected communicative tasks. (Speaking skills) • Identify and use main ideas and details from connected aural discourse involving description and narration in different timeframes or aspects, and about a variety of topics beyond immediacy of the situation for communicative purposes. (Listening skills) • Identify and use main ideas and details from authentic, connected, longer, written texts involving description and narration in different formats about a variety of topics for communicative purposes. (Reading skills) • Create with language to express meanings in written form about familiar topics using the major timeframes with some control of aspect. (Writing skills) • Think critically and analytically in response to socio-cultural, historical, and linguistic issues and/or classic and contemporary literary texts related to the culture of the target language. (Critical thinking and analytical skills) • Understand the cultural, political and artistic diversity of perspectives, practices and products of the target language populations including how racial and ethnic diversity relates to those perspectives, practices and products. (Globalization - Diversity) • Recognize, investigate, and produce written and oral discourse in the target language communicating findings about historical and contemporary issues important to life in countries of the target language. • Explore how historical, political, religious and economic forces have shaped the current world system with its power inequalities and efforts to address them with a focus on the culture of the target language. (Globalization – Global Engagement)

• Analyze the structure and use of the language at the sound, word, and sentence level. • Summarize different linguistic features observed in different dialects in terms of historical change, geographical location and social variables. • Explore and analyze the role of human interactions with the environment and its relation to the root causes of many global problems focusing on those occurring in the culture of the target language. (Globalization - Environmental Sustainability)	• Analyze the structure and use of the language at the sound, word, and sentence level. • Summarize different linguistic features observed in different dialects in terms of historical change, geographical location and social variables. • Explore and analyze the role of human interactions with the environment and its relation to the root causes of many global problems focusing on those occurring in the culture of the target language. (Globalization - Environmental Sustainability)

II.3. How to Develop Learning Outcomes

How to Begin

Developing agreed upon program-specific student learning goals is not always a quick and easy task. Programs vary in the extent to which the faculty share a common disciplinary framework or epistemology. When programs hold many subfields, specialties, or perspectives, identifying agreed upon goals may be more difficult than in programs where there is a unified approach to the discipline.

<u>Coming to agreement on the crucial concepts, skills, attitudes, etc., of the program</u>

Before actually writing or revising departmental goals and objectives, try some of the following activities:

Approach #1: Have open discussions with department faculty on one of the following topics or similar topics

- Describe the ideal student in your program at various phases throughout your program. Be concrete and focus on those strengths, skills, and values that you feel are the result of, or at least supported and nurtured by, the program experience. Then ask:
    - What does this student know?
    - What can this student do?
    - What does this student care about?
    - List and briefly describe the program experiences that contribute most to the development of the ideal student.
- List the achievements you implicitly expect of graduates in each major field.
- Describe your alumni in terms of such achievements as career accomplishments, lifestyles, citizenship activities, and aesthetic and intellectual involvement.

Approach #2: Review and react to goals and objectives from another unit that is similar but external

- Try grouping the statements into broad categories of student outcomes (e.g., knowledge, attitudes, behavior).

Approach #3: Collect and review instructional materials

- Try sorting materials by the type of learning each one is designed to promote: recognition/recall, comprehension/simple application, critical thinking/problem-solving.
- Use any of the following:
    - Syllabi and course outlines
    - Course assignments and tests
    - Textbooks (especially the tables of contents, introductions, and summaries)

Approach #4: Collect and review documents that describe your department and its programs

- Brochures and catalogue descriptions
- Accreditation reports
- Curriculum committee reports
- Mission statements

Approach #5: Use a Delphi technique or a modification

a. Choose an impartial facilitator to mediate a panel discussion about possible program goals. In a brainstorming session, ask each panel member to build a list of criteria that he or she thinks is important for program goals.
b. For each criterion, have each member anonymously rank it as: 1-very important; 2-somewhat important; or 3-not important.
c. Place the criteria in rank order and show the (anonymous) results to the panel.
d. Discuss possible reasons for items with high standard deviations.
e. Repeat the ranking process among the panelists until the panel can reach consensus. The objective is to reach consensus before writing goals and objectives.

adapted from the Ball State University, Assessment Workbook *(1999).*

How to Draft & Revise Outcomes

Now that you have conducted research and identified the broad concepts, skills, attitudes, etc., that you want student to learn within the program, it is time to begin writing the outcomes.

Effective Learning Outcomes

Learning outcomes are statements that specify what students will know or be able to do as a result of earning their degrees. Effective outcomes are usually expressed as knowledge, skills, or abilities that students will possess upon successful completion of a program. They provide guidance for faculty regarding content, instruction, and evaluation, and serve as the basis for ensuring program effectiveness. Because we evaluate student performance in terms of specific actions, the strongest learning outcomes are measurable and observable.

Key questions to consider when drafting learning outcomes:

- What is the most essential knowledge students need to have acquired upon successful completion of the program?
- Are there specific skills or abilities students need? What are they?
- How does the program attempt to shape students' attitudes or views regarding the discipline or profession?

EXAMPLE: Making a learning outcome stronger

The following illustration shows how two key questions can be used to strengthen weaker learning outcomes:

- Is the action accomplished by students?
- Is the specified action observable?
- Can the specified action be measured using direct measures of student learning?

The original learning outcome reads:

Upon successful completion of this program, students will be exposed to case studies documenting the use of ethical reasoning in daily decisions.

We evaluate this learning outcome by asking the questions.

- "Is the action done by the students?"
    - No, the action is not done by students, but by the faculty who present the case studies. The problem is that it says nothing about what students actually LEARN from being exposed to the case studies, so the value of this outcome is low. This learning outcome describes what FACULTY will do, not what students will learn. As such, it is not a learning-centered outcome.
- "Is the specified action observable?"
    - Yes, the action is observable, as students could be observed as they are exposed to the case studies. Perhaps one could determine what students might learn from being exposed to case studies, but this does little to develop student learning.
- "Can the specified action be measured using direct measures of student learning?"
    - No. There is nothing to measure in terms of what the student learns.

The revised learning outcome is:

Upon successful completion of this program, students will be able to apply ethical reasoning in daily decisions.

By asking the same three questions as before we can evaluate the learning outcome.

- "Is the action done by the students?"
    - Yes, the action is done by students.
- "Is the specified action observable?"
    - No, the action is difficult to directly observe. The resources required to observe the behavior directly would be extensive.
- "Can the specified action be measured using direct measures of student learning?"
    - No, it can be measured indirectly by asking students to comment on the extent to which they apply ethical reasoning in their daily decisions.

The faculty revise the learning outcome to:

Upon successful completion of this program, students will be able to appreciate the value of ethical reasoning in their daily decisions.

Again, we evaluate the learning outcome by using the same three questions.

- "Is the action done by the students?"
    - Yes, the action is done by students.
- "Is the specified action observable?"
    - Yes, the action is somewhat observable by viewing the student's actions/behaviors.
- "Can the specified action be measured using direct measures of student learning?"
    - It can only b. Yes, because it may be measured indirectly by asking students to comment on the extent to which they appreciate the value of ethical reasoning in their daily life.
    - No, because it is challenging to measure directly because appreciation is a concept which is difficult to define or operationalize.

Finally, the department develops the learning outcome:

Upon successful completion of this program, students will be able to apply ethical reasoning in discussing an ethical issue.

By revisiting the three questions, the strengths of this outcome emerge.

- "Is the action done by the students?"
    - Yes, the action is done by students.
- "Is the specified action observable?"
    - Yes, the action is observable. The student can be given an assignment in which they are required to apply ethical reasoning.

- "Can the specified action be measured using direct measures of student learning?"
    - Yes, it is measurable. The expectations can be defined and the student's performance measured against those standards.

III. Degree Program Expectation: Curriculum Design, Curriculum Map/Matrix

III.1. An Overview of the Curriculum Map/Matrix

The purpose of a curriculum map/matrix is to identify the program learning outcomes occurring across the courses and experiences of your program's curriculum.

The key to a good curriculum matrix or "map" is that it is useful for making decisions about the design of your program's curriculum. "Design" refers to course sequencing, assignment sequencing, and skill and concept development that occurs across the program. The goal of good design is to develop the program's curriculum in a way that creates the best learning experiences, and thus, the greatest likelihood, for students to achieve the program's learning outcomes.

The second purpose of developing a curriculum map is related to assessment. A curriculum map allows faculty to apply the findings that have resulted from their assessment. For example, say that your assessment shows students are not writing at the performance level determined by your faculty. You would use the curriculum map to identify the courses addressing your writing outcome, or containing writing assignments. Then, you would pull the syllabi for those courses and convene the faculty teaching those courses. They would review and converse how they are addressing writing in their courses and determine if there would be approaches to re-structuring their outcomes or assignments that would lead to an improved progression of learning across the curriculum.

For both curriculum design and the use of assessment findings, the map/matrix is meant to serve as a catalyst for discussions about the proper sequencing of courses, the degree to which the curriculum really supports student learning, and the extent to which learning outcomes are appropriately addressed within the curriculum. **Discussing the link between learning outcomes and the curriculum leads to the crucial conversations about how courses, assignments, and teaching techniques within the program facilitate or hinder accomplishment of program learning outcomes.**

III.2. Characteristics of Curriculum Design and the Curriculum Map/Matrix

Curriculum has coherent course sequencing and structure designed to achieve the intended student learning outcomes in a manner that both students and faculty can articulate the rationale behind the sequencing and structure of the degree program.

- A basic curriculum matrix visually demonstrates the courses covering each intended degree program student learning outcome (including the courses and experiences required from other academic units).
- A written description of how the courses and their sequence relate to students' achievement of the intended learning outcomes.

Remember that if you identify a course as covering a learning outcome, the course learning outcomes of the syllabus should align with the program outcomes identified in the curriculum map as being covered in the course. If the syllabi do not align with the Curriculum Map, then either the map or the syllabus will need to be revised.

III.3. Types of Curriculum Maps

The purpose of the curriculum map is to ensure students have the appropriate preparation, learning experiences, course sequencing, etc., that students are most likely to achieve the program's learning outcomes. If your academic program requires courses from outside of your unit, then you have obviously selected those courses because they provide crucial concepts and skills needed by your students. You will need to identify how those courses are leading toward fulfillment of learning outcomes in your curriculum map.

Below are some frameworks for matrixes that might be helpful to you in visually identifying the links between (a) intended outcomes and (b) courses or other curricular experiences. Along the top of the matrix, list all the courses, experiences, and other requirements/options (internships, service learning, theses, etc.) for your program. Along the side, list your program's outcomes. Then indicate which of the outcomes are addressed in each of the requirements/options by filling in the "cells" where the learning outcome row and course "column" coincide. How you fill in the "cells" of the matrix defines the type of curriculum map that it is. A "Basic Map" usually simply identifies an "x" for the course wherein the outcome is taught. Maps can identify the level of learning of the outcome in the course (introduced, reinforced, etc.), and even the course outcomes or assignments that address the outcome in the course.

- adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017).

Examples of different maps are below:

The Basic Map/Matrix: Required for curriculum proposals

Typically, the first map/matrix a group creates is more basic—visually demonstrating broad strokes about the curriculum. These maps assist in identifying gaps and unintentional redundancies in covering Degree Program Student Learning Outcomes.

As in the example basic map/matrix from Forestry, the curriculum map/matrix includes:

- All Degree Program Student Learning Outcomes of the degree program; and
- All courses required in the degree program, even those courses that are required, recommended, or an elective outside of the academic unit of the program.

The "Level of Learning" Map/Matrix

The "Level of Learning" Map/Matrix assists programs in agreeing upon desired levels of learning within and across courses. Faculty members agree upon definitions of learning for the program, such as "I = Introduced; R - Reinforced; RA - Reinforced through application; M - Mastery within the context of our curriculum. This approach assists faculty in scaffolding learning across the curriculum.

The Course-to-Program Outcome Alignment Map/Matrix

The Social Work Program developed this map/matrix to determine how well their course outcomes were aligned with their program outcomes. This information provides the opportunity to understand how outcomes are "scaffolded," or developed consecutively, throughout the degree program.

In addition, when assessment data/information is reviewed, the data can be connected directly back to course outcomes and course design. The program faculty can then pinpoint the courses to improve learning outcomes and course design within the curriculum.

III.4. How to Develop a Curriculum Map

Approach #1: Conducting a Curriculum (or Syllabus) Analysis. Curriculum analysis involves a systematic review of course syllabi, textbooks, exams, and other materials to help you clarify learning outcomes, explore differences and similarities between courses and class sections of courses, and/or assess the effectiveness of instructional materials. It offers a way to document which courses will cover which objectives and helps in sequencing courses within a program.

Approach #2: The survey approach (better with larger groups). Develop a survey of faculty members' courses that requests each faculty member to identify the program's learning outcomes they address in the classes they teach and how they address each learning outcome. Compile the responses into a matrix.

Approach #3: The retreat approach (better with smaller groups). Prior to the retreat, create a Matrix on the wall, either using a white or black board, or a big piece of paper. If you have the ability to use a projector, you can create an empty matrix in Excel, and project it onto the wall. The matrix you create would contain all of the learning outcomes down the left side, and all of the curricular and experiential requirements (starting with those in the department, but also including those requirements outside of the department).

Then, there are a variety of ways to fill in the matrix. With smaller groups, you would discuss each of the courses and whether (and/or how) the learning outcome is addressed in the course. This leads to a rich discussion of what faculty are covering in their courses, how they are covering material, and clarifies assumptions and expectations. The facilitator would mark the cells for the learning outcomes that are covered in each course either either using markers or chalk on the white board, or typing into the Excel program projected on the wall. Depending on the length of conversations, and number of learning outcomes and requirements, faculty might need a few one to two hour meetings to complete the map.

III.5. How to Align Syllabi to the Curriculum Map

The purpose of the curriculum map is to identify the courses within which program learning outcomes are addressed. Based on this purpose, it makes sense that the syllabus (including the instructor's syllabus and the "master" syllabus or "syllabus or record" for the course) would clearly contain connections to the program learning outcomes covered in the curriculum map. If the syllabi do not align with the Curriculum Map, then either the map or the syllabus will need to be revised. Syllabi (both instructor syllabi and the "master" syllabus or "syllabus or record") can certainly contain more learning outcomes and experiences than are identified in the curriculum map, but they MUST, at a minimum, contain learning outcomes connected to the program learning outcomes identified in the curriculum map.

Here are a few of the approaches faculty have used at NAU to ensure it is clear to a student, a faculty member, or a reviewer that a course addresses the learning outcomes identified in the curriculum map:

- Numbering or lettering the Program Learning Outcomes, then placing that number of letter in parentheses next to the course learning outcome. Here is an example from Engineering, where they have "lettered" their Program Learning Outcomes "a through k."
    - Outcome 1: Know the basic concepts and the principles of vibration analysis and design. (LO a)*
    - Outcome 2: Formulate and solve a wide variety of real engineering problems by solving a representative number of homework problems. (LO a,e)*
    - Outcome 2: Apply your knowledge of matrices and computers to solve a variety of engineering problems, and to simulate real systems with many degrees of freedom undergoing free and forced vibration. (LO a,e,k)*
    - Outcome 3: Apply vibrations concepts in designing some basic vibration instrumentation and vibration systems. (LO a,e,c,i)*
- Write the course learning outcome in a manner that it is clear that it connects to the program outcome(s) identified in the course. In the following example, you can see how the course learning outcomes focus on technology. Notice that it is not always possible for an "external reader" to know that the course outcomes are linked to the program outcome. Keep this in mind if you choose this route:
    - Program Outcome: Students will understand the major developments in the history of communication technology so that they understand how innovation and institutionalization occur in different settings.

- Course Learning Outcomes:
  - You will be able to write an analysis comparing, contrasting, and evaluating different technologies across different cultural contexts.
  - You will be able to summarize the major technological developments in communication from prehistory to the present.
  - You will write a research paper on the uses, strengths, and weaknesses of one modern communication technology.

III.6. How to Develop a Written Description of the Curriculum

The purpose of developing a written description of the curriculum is to describe the pathway of learning students will follow in the completion of their program's course requirements. Frequently, writing such a description engages faculty in a critical examination of how the sequencing of courses and experiences within the curriculum achieves the learning outcomes set forth in the degree program. An analytical examination often results in identifying ways to improve the sequencing of courses and learning experiences.

The description is meant to emerge from examining the Degree Progression Plan and the Curriculum Map. Merging the information of these two documents places the learning outcomes into time. It provides a perspective of when students likely experience learning in the program, and the opportunity to analyze this timeframe and determine whether changes would improve students' learning experience. A common way to develop a description is to create a curriculum map (or request such a map be created for your program by the Office of Curriculum, Learning Design & Academic Assessment) that reflects the course requirements set forth in the Degree Progression Plan, then describe the results.

Most undergraduate programs develop a summary describing:

- the foundational learning provided in the degree program, then describes
- how the program builds upon key fundamentals,
- opportunities within the program to explore electives or emphasis areas,
- key learning experiences such as clinics, hands-on projects, internships, etc., and
- the capstone experience, and how it culminates the learning within the program and prepares students for their future beyond the program.

Most graduate programs develop a summary describing:

- the knowledge and skills necessary for students to achieve prior to entering the program, in other words, the pre-requisite content and skills that the program will use as a foundation
- how the program builds upon key fundamentals,
- opportunities within the program to explore electives or emphasis areas,
- key learning experiences such as clinics, hands-on projects, internships, etc., and
- the culminating experience, and how it synthesizes the learning within the program and prepares students for their future beyond the program.

<u>Example from Journalism B.S.</u>

The Journalism, Photojournalism and Documentary Studies Program provides students with the hands-on experience to tell compelling nonfiction stories in a variety of media platforms.

We build a strong foundation in the history, philosophy and ethics of journalism, photojournalism and documentary studies, and emphasize how these disciplines serve varied communities and facilitate the free flow of information needed in a democratic society. Students learn to take a global perspective as they critically assess journalistic and documentary work from a variety of places and historical periods. By valuing the principles of the journalistic tradition, our students obtain the critical and creative edge to innovate and be relevant in an evolving media world.

Built upon the fundamentals of storytelling and nonfiction narrative, our curriculum ensures that students can cover breaking news as well as develop features and deeper, under-reported stories. Our students are

informed and curious about their communities, and develop a critical understanding of media forms that allows them to identify audience needs and place stories within context. By honing methods of investigative research, relationship building and interviewing, our students learn to gather the materials needed to craft compelling narratives. Their creative works are refined through individual mentoring from instructors as well as through intensive student peer review.

The program's faculty are innovative teachers and professionals who engage students in their current projects through hands-on experience and personalized mentoring. Students produce and publish journalism for real audiences through classwork and in our state-of-the-art Student Media Center, which integrates a newsroom, TV studio and radio station. Internship and independent study projects allow them to report in depth on subjects important to our community or structured around their passions.

Our goal is to train students to be savvy media consumers and producers who can succeed not only in the realm of professional journalism, but within whatever future they create.

IV. Degree Program Expectation: Systematic Assessment

IV.1. Overview of Assessment

What is Assessment and Why Assess?

Adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017); and Marymount University Assessment Handbook (2015)

This document will help you think about assessment in terms of how it can benefit you, your fellow faculty members, and the students within your academic unit.

What is Assessment?

At NAU assessment is about improvement. The goal of program assessment is to help you focus on improving student learning in your classes and in your academic programs.

Program-Level Learning Outcomes Assessment

There are many types of assessment. At NAU, we focus our attention on the achievement of "program-level learning outcomes assessment." Program-level learning outcomes assessment is the systematic examination of student achievement of learning outcomes within a degree program. It is the process by which faculty assess student mastery of program-level outcomes. As with all learning outcomes assessment, the primary goal is the continued improvement of academic quality of the course, of the academic program, and of the institution.

When developing and implementing program learning outcomes assessment strategies, academic units should focus on four crucial questions:

- What knowledge, skills, attitudes, etc. will successful students have acquired upon graduation (or program completion)?
- How well do students perform relative to these learning outcomes?
- How can programs demonstrate and celebrate the learning strengths of students?
- How can programs improve to provide a stronger academic experience to students?

Why Assess?…To Improve Student Learning

Adapted from Marymount University Assessment Handbook (2015) and the University of Wisconsin-Madison Using Assessment for Academic Program Improvement, (April 2000).

Faculty members assess all the time in their classes and in their programs. Professors are constantly considering what worked well and what didn't, and using those observations and impressions to make changes in their curriculum. What "formal assessment" (called "systematic assessment" at NAU) does is make those informal activities more systematic and more public. Assessment can facilitate improvement through a variety of venues. When faculty members are directly involved in the development, implementation, and analysis of assessment activities, a number of specific benefits can result:

Benefits of Learning Outcomes Assessment

Learning outcomes assessment:

- Benefits students by ensuring they master the material of their degree program;
- Benefits students by ensuring academic and professional programs are responsive to both their and society's needs.
- Benefits faculty by providing the tools necessary to lead curricular renewal and development.
- Benefits NAU by giving the university evidence of student learning and achievement. This validates to our regional accreditors, parents, students, ABOR, the state of Arizona, and other external audiences

Learning Outcomes Assessment and Accreditation

Since the 1990s, issues of accountability in higher education have been increasingly common concerns of federal, regional, and state regulators. Often the standards of learning are discussed during hearings on the reaffirmation of the Higher Education Act, but to date higher education has been able to argue convincingly that self-regulation is the most effective method for ensuring academic quality and accountability. To this goal, the Higher Learning Commission (HLC), NAU's regional accrediting body, has greatly increased its emphasis on learning outcomes assessment.

hile the HLC Criterion for Accreditation clearly emphasize the importance of assessment and use of findings for continual improvement, the criterion are written with intentional breadth to allow individual member institutions flexibility in developing assessment approaches tailored to their faculty and students. At NAU, the Faculty Senate's curriculum and assessment committees jointly created and implemented the Degree Program Expectations. The Degree Program Expectations are NAU's approach to ensuring all degree programs develop and maintain high quality curriculum design and meaningful assessment practices. The Faculty Senate's Curriculum & Assessment Coordinating Committee is charged with ensuring all academic units achieve and maintain the Degree Program Expectations, to ensure we are on track with HLC Accreditation Requirements.

Adapted from Marymount University Assessment Handbook (2015)

Assessment Responsibilities at NAU

Roles and Responsibilities for Learning Outcomes Assessment at NAU

Adapted from Marymount University Assessment Handbook (2015).

For learning outcomes assessment to be truly effective, it must be connected to curriculum, under the stewardship of faculty, and a University-wide process. At NAU, faculty, academic unit leaders, support staff, faculty on college committees, and faculty on Faculty Senate committees are directly involved with assessment in the following ways:

- Faculty develop learning outcomes, assess student performance, and provide the necessary analysis to understand the achievement of learning outcomes in their programs.
- Academic unit chairs, directors and coordinators manage the assessment process within their programs and ensure consistent progress on curriculum and assessment is achieved through submitting annual Curriculum & Assessment Reports.
- Academic unit chairs, directors and coordinators compile data, facilitate conversations with faculty concerning findings, and submit the Self-Study Report during their Academic Program Review. The Self-Study Report provides evidence of student learning and plans for future curriculum and assessment actions.
- The Office of Curriculum, Learning Design & Academic Assessment coordinates and supports the overall assessment effort and provides methodological and technical support throughout the process. This office collects and posts purpose and learning outcomes in the Academic Catalog, and annual and periodic reports in the SharePoint Archives. It compiles reports for the Provost, Deans, college committees and university committees showing NAU's progress in achieving curriculum and assessment requirements for NAU's regional accreditor, the Higher Learning Commission.
- Faculty on College Curriculum & Assessment Committees provide feedback on curriculum proposals submitted for the academic catalog to ensure the new and changing curriculum achieve the marks of high-quality established by the faculty in the Degree Program Expectations.
- Faculty on the University Undergraduate Committee and University Graduate Committee (Faculty Senate Committees) review and provide feedback to units concerning the quality of their curriculum design and assessment practices as part of the Academic Program Review process.
- Faculty on the Curriculum & Assessment Coordinating Committee (a Faculty Senate Committee) review feedback concerning the process and identify approaches to ensure that our processes are resulting in evidence that will achieve the requirements of NAU's regional accreditor, the Higher Learning Commission.

The Cyclical Nature of Learning Outcomes Assessment and NAU's Six Step Assessment Cycle

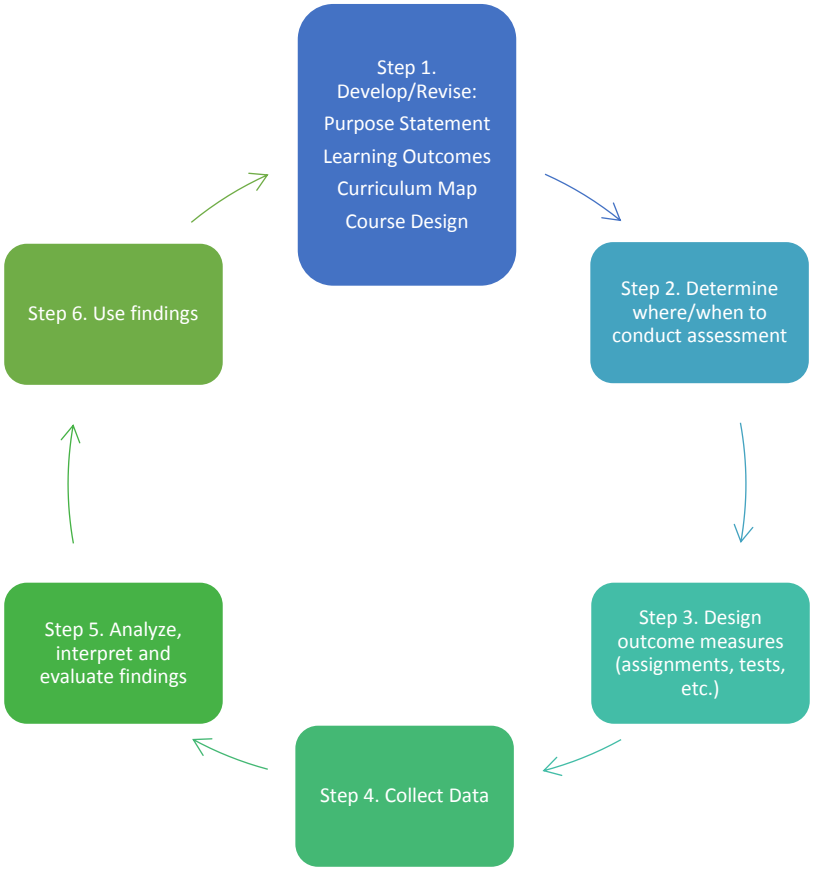
Adapted from Marymount University Assessment Handbook (2015)

Since the primary goal of program learning outcomes assessment is continued improvement of the quality of education offered by NAU, the process is cyclical in nature. Assessment is an ongoing process that should evolve and change as programs and students evolve and change.

There are six steps to NAU's learning outcomes assessment cycle:

1. Develop/revise purpose statements, learning outcomes, curriculum map, course design (covered in other Degree Program Expectations)
2. Determine where/when to conduct assessment
3. Design outcome measures (assignments, tests, etc.)
4. Collect data
5. Analyze, interpret and evaluate findings
6. Use findings: Select actions to take based on assessment findings and develop a plan to implement actions

Figure: Program Learning Outcomes Assessment Cycle



The resources provided in this document will assist you in completing the Self-Study Report Template. For each step, the document:

- Provides a basic overview of the goals and purpose of the step,
- lists the specific activities for units associated with the step, and
- offers suggestions and potential strategies for effectively completing the step.

The ideas and suggestions for completing the steps are intended to provide useful information for faculty and department chairs. Meaningful assessment practices are anything but a one-size-fits-all approach. For assessment to be useful, it needs to be tailored to fit each academic unit and program. **Since each**

academic department or school and its degree programs differ in terms of size, approach, and outlook, it is important to ensure that the assessment approach matches the needs of the program, the faculty, and students. Staff from the Office of Curriculum, Learning Design, & Academic Assessment are available to discuss any thoughts or ideas to help programs build a learning outcomes assessment approach that fulfills NAU's assessment requirements and meets the needs of your faculty and students.

IV.2. Characteristics of Systematic Assessment

Information about student learning is collected and analyzed by program faculty to determine the extent students achieve degree program student learning outcomes. **NAU requires that minimally, all broad learning outcomes are assessed using direct methods of assessment toward or at the end of the student's program of study <u>at least once</u> between program reviews.** The following evidence is documented in relation to the assessment of each broad learning outcome:

- Assessment Planning, Design & Data/Information Collection. The academic unit systematically obtains information about student's performance of learning outcomes using valid assignment(s), performance indicator (s), or measurement tool(s) or approach(es) selected or developed by the faculty members in the program.
- Analysis of Data & Discussion of Findings: Analysis and findings articulate the discoveries and findings for each broad learning outcome.

IV.3. Step 1: Describe where, when and how assessment evidence was collected

To determine where/when to conduct assessment, the first thing to consider is the minimum assessment requirement, so that you conduct assessment in a manner that fulfills the requirement:

NAU requires that minimally, all broad learning outcomes are assessed using direct methods of assessment toward or at the end of the student's program of study <u>at least once</u> between program reviews.

Using the capstone course or "experience"

Adapted from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006) and the University of Wisconsin, Madison, Outcomes Assessment Manual (2000).

The most promising course to review for use in assessment is the capstone course for undergraduate programs, or, if you are assessing a graduate program, we would recommend starting by reviewing the comprehensive exams and/or thesis/dissertation.

NAU's undergraduate capstone requirement, and comprehensive exams or theses/dissertations in graduate programs, are designed to provide a culminating experience within the degree, wherein students inquire, synthesize, apply, or work in ways that prepare them for a productive future; or demonstrate the breadth and depth of their learning through comps and theses. Since the capstone is a culminating experience that is meant to ensure students demonstrate the ability to synthesize and integrate knowledge and experiences of learning throughout their program, it is very likely that most, if not all, learning outcomes for the degree program are incorporated into the capstone course. But, you can only use the capstone as a key place to collect outcome measures if:

- the course and its assignments are truly representative of requirements for the degree;
- the course curriculum and assignment evaluation (or products) are consistent across sections or instructors or comprehensive exam/thesis/dissertation committees; and
- students understand the value and importance of the capstone course, senior assignment, or comprehensive exam/thesis/dissertation and take this requirement seriously—meaning their performance is most likely reflects their best effort.

More about using the capstone for assessment **adapted from Ball State University Assessment Workbook (2012)*

Capstone courses: Capstone courses provide an opportunity to measure student learning, because this is where students are most likely to exhibit their cumulative understanding and competence in the discipline. One of the purposes of capstone courses is to provide an opportunity for students to "put it together," which typically requires students to integrate the knowledge, skills and abilities found in the program's learning outcomes.

Culminating assignments offer students the opportunity to put together the knowledge and skills they have acquired in the major, provide a final common experience for majors, and offer faculty a way to assess student achievement across a number of discipline-specific areas. Culminating assignments are generally designed for seniors in a major or field to complete in the last semester before graduation. Their purpose is to integrate knowledge, concepts and skills that students are expected to have acquired in the program during the course of their study. This is obviously a curricular structure as well as an assessment technique and may consist of a single culminating course (a "capstone" course) or a small group of courses designed to measure competencies of students who are completing the program. A senior assignment is a final culminating project for graduating seniors such as a performance portfolio or a thesis that has the same integrative purpose as the capstone course.

Advantages of using the capstone course or a culminating experience

- When capstone courses or projects are required, they can provide an ideal data collection opportunity because seniors are accessible.
- Assessments can provide an opportunity to motivate students through the curriculum. Also they can provide quality data that permit meaningful reflection on the program.
- Seniors are well into the curriculum and can reflect on their learning experience and the curriculum.
- These assessment methods provide seniors with an opportunity to provide meaningful feedback when they believe that their opinions are respected and valued.
- Students get feedback on their accomplishments, and student responsibility is encouraged.
- They can be used for both student evaluation (assess seniors' overall ability and knowledge gained from the program) and program evaluation (annual, continuous evaluation of curriculum from student feedback).
- They support program coherence.
- They provide an opportunity to create local assessment instruments that can be used in conjunction with other methods, such as surveys and standardized tests.
- Many faculty members are engaged in planning the topics and the design of the capstone experience.
- This assessment allows flexible course content (i.e., adaptable to different courses).

Disadvantages

- Student performance may be impaired due to "high stakes" of the project. Successfully completing the capstone course may be a requirement for graduation, which may generate some anxiety for both faculty and students.
- A faculty member may develop the idea that the capstone course or project should only involve him or her.

Considerations

- Ensure that the course assignments or projects accurately represent the major or program requirements.
- Use checkpoints to prevent difficulties, especially towards the end, which may affect a student's graduation.
- Maintain the curriculum and evaluation of assignments across all sections.

- Ensure that students understand and value the importance of the capstone experience and take it seriously.
- Secure administrative support before implementing a capstone experience since there are usually high costs associated with it because of the small class size required to maximize the faculty-student interaction.
- Design capstone course or project to assess curriculum goals and outcomes.

Keep in mind:

- adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017).

Assessment data can offer useful insight into department and program effectiveness when carefully analyzed and interpreted in the context in which it was collected – for overall program improvement. Data are misleading, and even threatening, when they are used for purposes other than originally intended and agreed upon. For example, data from assessment of student performance in a capstone course should be used to identify areas of strengths and weaknesses in student learning across the students' entire experience in the major. In this way, these data guide curricular modifications and departmental pedagogical strategies. These data should not be used to evaluate the performance of the capstone course instructor.

<u>What if the capstone (or culminating experience) won't work for your program's assessment?</u>

If you find that:

- the capstone is not a good place to conduct the assessment, or
- that not all learning outcomes are included in the capstone, or
- you are unable to assess all learning outcomes in the capstone,

Then you will want to take two steps. The first step is to consider revising the capstone, because if it's not providing a culminating experience for students wherein they demonstrate their learning from throughout the program, then it's likely not achieving its goals.

The second step is to use the curriculum map to identify the course or experience within which you will conduct the (or an additional) assessment(s). The curriculum map makes it possible to identify where, within the current curriculum, your program's learning outcomes are addressed. If you need to use the map to identify a course or experience within which you will conduct the assessment, simply:

- identify the learning outcomes that you need to assess,
- find the course that is addressing that outcome and doing so as close to the end of the students' experience in the program, and
- pull the syllabus for that course.
- Review the syllabus to determine what, if any, assignments would address the learning outcome. Since the syllabus (based on the syllabus policy) must address the learning outcomes identified in the curriculum map, and be consistent across class sections, the syllabus should provide you with the information you need to determine whether the course's current design will suffice for incorporating assessment practices.

You may need to work with the faculty members teaching that course to re-design different aspects of it, or re-think the assignments to ensure they are truly representative of the learning outcomes.

About Course-Embedded Assessment

In effect, we strive to engage in course-embedded assessment (also called "authentic assessment") at NAU. Course-embedded assessment refers to methods of assessing student learning within the classroom environment, using course goals, objectives and content to gauge the extent of learning that is taking place. This technique generates information about what and how students are learning within the program and classroom environment, using existing information that instructors routinely collect (test performance,

short answer performance, quizzes, essays, etc.) or through assessment instruments introduced into a course specifically for the purpose of measuring student learning.

Including Assessment on your Curriculum Map

- adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017).

Based on this information it might be useful to add assessment information to your curriculum map. Instructors and departments are already assessing student learning through a variety of methods including assignments, exams, etc., though you may not have called these elements "assessment." To add assessment aspects to your map, you might want to include an "A" in the matrix for the courses where you conduct a formal assessment. An assessment matrix is a particularly useful way of linking outcomes to assessment tools, program requirements and course curricula.

Enlist the assistance of assessment and testing specialists when you plan to create, adapt, or revise assessment instruments. Staff in the Office of Curriculum, Learning Design & Academic Assessment (LINK) are happy to assist you in finding the appropriate resources and helping you to design the assessment. Areas in which you might want to seek assistance include:

- ensuring validity and reliability of test instruments;
- ensuring validity and reliability of qualitative methods;
- identifying appropriate assessment measurements for specific goals and tasks; and
- analyzing and interpreting quantitative and qualitative data collected as part of your assessment plan.

Adapted from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006)

IV.4. Step 2: Design outcome measures (assignments, tests, portfolios, etc.)

Overview of Designing Outcome Measures

Adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017) and from Marymount University Assessment Handbook (2015)

Now that you have identified the courses or experiences within which you will assess student learning (courses that you can use "direct measures" in and that are "at or near the end of the program"), it is time to adapt current assignments, tests, etc. into outcome measures, or develop new assignments into outcome measures within that course or experience.

Direct Methods of Assessment

Direct measures of student learning require students to display their achievement of student learning (knowledge and skills) as they respond to the assignment, or "instrument," itself. Because direct measures capture what students can actually do, they are excellent for measuring levels of achievement of student learning on specific outcomes.

What are "direct" and "indirect" measures of student learning, and why do we focus on direct measures at NAU?

Adapted from Marymount University Assessment Handbook (2015), from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017), and from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006), and from Ball State University Assessment Workbook (2012)

Following are the definitions of direct and indirect measures of student learning:

Direct measures "require students to display their knowledge and skills as they respond to the instrument itself. Objective tests, essays, presentations, and classroom assignments all meet this criterion."

From (Palomba and Banta, 1999, Assessment Essentials: Planning, Implementing, and Improving Assessment in Higher Education; pp.11-12.

Examples of Direct Measures of Student Learning from Cleveland State University:

- Scores and pass rates on standardized tests (licensure/certification as well as other published tests determining key student learning outcomes)
- Writing samples
- Score gains indicating the "value added" to the students' learning experiences by comparing entry and exit tests (either published or locally developed) as well as writing samples
- Locally designed quizzes, tests, and inventories
- Portfolio artifacts (these artifacts could be designed for introductory, working, or professional portfolios)
- Capstone projects (these could include research papers, presentations, theses, dissertations, oral defenses, exhibitions, or performances)
- Case studies
- Team/group projects and presentations
- Oral examination
- Internships, clinical experiences, practica, student teaching, or other professional/content-related experiences engaging students in hands-on experiences in their respective fields of study (accompanied by ratings or evaluation forms from field/clinical supervisors)
- Service-learning projects or experiences
- Authentic and performance-based projects or experiences engaging students in opportunities to apply their knowledge to the larger community (accompanied by ratings, scoring rubrics or performance checklists from project/experience coordinator or supervisor)
- Graduates' skills in the workplace rated by employers
- Online course asynchronous discussions analyzed by class instructors

Indirect methods such as surveys and interviews ask students to reflect on their learning rather than to demonstrate it.

From Palomba and Banta, 1999, Assessment Essentials: Planning, Implementing, and Improving Assessment in Higher Education.

Examples of Indirect Measures of Student Learning from Ball State University:

Course grades and grade distributions

- Assignment grades, if not accompanied by a rubric or scoring criteria
- Retention and graduation rates
- Admission rates into graduate programs and graduation rates from those programs
- Scores on tests required for graduate level work (such as the GRE) that evaluate skills learned over a lifetime
- Quality and reputation of graduate programs into which alumni are accepted
- Placement rates of graduates into appropriate career positions and starting salaries
- Alumni perceptions of their career responsibilities and satisfaction
- Student feedback of their knowledge and skills, and reflections on what they have learned over the course of their program
- Questions on end-of-course student evaluation forms that ask about the course rather than the instructor
- Student, alumni, and employer satisfaction with learning collected through surveys, exit interviews, or focus groups
- Student participation rates in faculty research, publications, and conference publications
- Honors, awards, and scholarships earned by students and alumni

Assessment and Grading: Why are grades indirect measures of student learning?

Grades (including pass/fail) are global evaluations that represent the overall proficiency of students. Traditional grading which offers one "score" to represent the sum total of a student's performance across a host of outcomes and assignments within a course does not provide the detailed and specific information necessary for linking student performance to program objectives and, ultimately, to improvement. Because

grades don't tell you about student performance on individual (or specific) learning outcomes, or how students are or are not performing well on that outcome, they provide little information on the overall success of the program in helping students attain specific and distinct learning objectives of interest.

A key part of deciding on what assessment methods to use is to know what learning outcome(s) you want to assess. With NAU's assessment requirement, it is simple to know what to assess: each of your program's broad learning outcomes.

Since direct measures "require students to display their knowledge and skills (Palomba and Banta, 1999, pp. 11-12)," it is the most effective way to determine student achievement of degree program learning outcomes. Direct measures ensure faculty can assess student mastery of outcomes, which is the focus for program-level learning outcomes assessment.

How to Select or Develop Direct Measures of Student Learning

How do I select a direct measure of student learning in the curriculum?

Adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017).

The most effective assessment approach is one that is closely linked to the curriculum and uses available information and resources to the greatest degree possible. Before designing additional assessment components it is important to document how the current curriculum matches the program's learning outcomes and to inventory what assessment-related information/processes are already in place that you can draw upon.

At NAU, we strive to engage academic unit faculty in developing course-embedded assessment in their capstone courses (and comprehensive exams or theses/dissertations in graduate programs), as it has the greatest potential to provide an efficient, effective approach to collecting assessment data. Over the past decade at NAU, faculty and staff have noticed that the more complex an assessment plan is (the more courses and assignments that are used to collect data), the more likely that data will not be collected, interpreted, and used. By identifying one or two places to conduct assessment, it makes the process much more manageable.

Outcome Measures Should Meet Three Criterion

While learning outcomes describe the knowledge, skills and abilities that students should possess after instruction (or completion of the program), outcome measures are the specific tools and measures that generate data and information about students' performance relative to learning outcomes. Regardless of the type of measure used, strong measures share three basic qualities:

1. Provide sufficient data and information to measure the learning outcome;
2. Are not overly burdensome on faculty or units to collect; and
3. If possible, have established performance standards and expected results to help guide analyses.

There are many issues to consider when selecting direct measures of learning. Programs should be creative in determining the most useful way to measure student performance. Yet, in this creativity, it is essential that the assessment approaches selected allow faculty to derive meaning from the qualitative or quantitative data generated. **Faculty must be able to link the results to the learning outcomes, and interpret the results so that they can use the results to inform assessment decisions, curriculum decisions, and/or the dissemination of learning strengths.** Choose assessment methods that allow you to assess the strengths and weaknesses of student learning. Effective methods of assessment provide both positive and negative feedback. Finding out what is working well is part of the assessment goal; the other part of the assessment goal is to find out what isn't working well.

What are some guidelines for selecting outcome measures?

Adapted from Volkwein, J., Program evaluation and assessment: What's the question (1996).

Faculty teaching within the academic program will select or develop outcome measures that will provide the most useful and relevant information to determine the achievement of student learning. Not all methods work for all fields of study or are appropriate to all reasons for assessing. Most importantly:

The evidence you collect depends on the learning outcomes you want to examine. In thinking about program learning outcomes assessment, three questions come to mind:

- Does the program do a good job at achieving the learning outcomes it sets out to achieve?
- Does the program meet or exceed certain learning standards for their outcomes?
- How can students' learning experiences be improved?

Common Outcome Measures

Tests & Exams

Adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017) and from Marymount University Assessment Handbook (2015).

Selecting a standardized instrument (developed outside the institution for application to a wide group of students using national/regional norms and standards) or a locally-developed assessment tool (created within the institution, program or department for internal use only) depends on specific needs and available resources. Knowing what you want to measure is key to successful selection of standardized instruments, as is administering the assessment to a representative sample in order to develop local norms and standards. Locally-developed instruments can be tailored to measure specific performance expectations for a course or group of students.

Locally-developed instruments are directly linked to local curriculum and can identify student performance on a set of locally-important criteria. Putting together a local tool, however, is time-consuming as is development of a scoring key/method. There is also no comparison group and performance cannot be compared to state or national norms. Standardized tests are immediately available for administration and, therefore, are less expensive to develop than creating local tests from scratch. Changes in performance can be tracked and compared to norm groups and subjectivity/misinterpretation is reduced. However, standardized measures may not link to local curricula and purchasing the tests can be expensive. Test scores may also not contain enough locally-relevant information to be useful.

Examinations

Many course-level Student Learning Outcomes (SLOs) can be assessed by examinations given within the course. In some cases the outcomes measured by the examinations will be identical to the program's student learning outcomes and, the exam questions will assess both course and program outcomes. With some creativity, exam questions can also be written to cover broader program SLOs without losing their validity for course grading. In programs without capstone courses, it might be possible to write a coordinated set of exam questions that provide a fuller picture of student learning when administered in exams across a series of courses.

Standardized and certification exams

In some disciplines, national standardized or certification exams exist which can be used as measures if they reflect the program's learning outcomes. The examination usually cuts across the content of specific courses and reflects the externally valued knowledge, skills and abilities of a program.

Pre-test/Post-test Evaluations

This method of assessment uses locally developed and administered tests and exams at the beginning and end of a course or program in order to monitor student progression and learning across pre-defined periods of time. Results can be used to identify areas of skill deficiency and to track improvement within

the assigned time frame. Tests used for assessment purposes are designed to collect data that can be used along with other institutional data to describe student achievement.

Pre-test/post-test evaluations can be an effective way to collect information on students when they enter and leave a particular program or course, and provide assessment data over a period of time. They can sample student knowledge quickly and allow comparisons between different students groups, or the same group over time. They do however, require additional time to develop and administer and can pose problems for data collection and storage. Care should be taken to ensure that the tests measure what they are intended to measure over time (and that they fit with program learning objectives) and that there is consistency in test items, administration and application of scoring standards.

Performance Assessments

Adapted from the California State University, Bakersfield, PACT Outcomes Assessment Handbook (1999) and from Marymount University Assessment Handbook (2015)

Performance assessment uses student activities to assess skills and knowledge. These activities include class assignments, auditions, recitals, projects, presentations and similar tasks. At its most effective, performance assessment is linked to the curriculum and uses real samples of student work. This type of assessment generally requires students to use critical thinking and problem-solving skills within a context relevant to their field or major. The performance is rated by faculty or qualified observers and assessment data is collected. The student receives feedback on the performance and evaluation.

Strengths and Weaknesses: Performance assessment can yield valuable insight into student learning and provides students with comprehensive information on improving their skills. Communication between faculty and students is often strengthened, and the opportunity for students' self-assessment is increased. Performance assessment, like all assessment methods, is based on clear statements about learning objectives. This type of assessment is also labor-intensive, is sometimes separate from the daily routine of faculty and student, and may be seen as an intrusion or an additional burden. Articulating the skills that will be examined and specifying the criteria for evaluation may be both time-consuming and difficult.

Analysis of papers

Course papers can be used as measures for student learning outcomes. Because students create these papers for a grade, they are motivated to do their best and these papers may reflect the students' best work. This process typically requires development of a different rubric that focuses on program learning outcomes. Faculty committees can also read these same papers to assess the attainment of program SLOs. In most cases, this second reading should be done by someone other than the instructor or by others along with the instructor, as the purpose for the assessment is different than grading. Scoring rubrics for the papers, based on the relevant learning outcomes should be developed and shared with faculty raters prior to rating to promote interrater reliability.

Analysis of projects and presentations

Products other than papers can also be assessed for attainment of program learning outcomes. For example, if students are required to give oral presentations, other faculty and even area professionals can be invited to these presentations and can serve as outside evaluators using the same rubric as other raters.

Student performances

In some areas, such as teaching or counseling, analysis of student classroom teaching, mock counseling sessions or other performances can provide useful measures of student learning. A standardized evaluation form is necessary to ensure consistency in assessment. One advantage of using performances is that they can be videotaped for later analysis.

Internship supervisor evaluations

If the program has a number of students who are doing relevant internships or other work-based learning, standard evaluations by supervisors using a rubric designed to measure a particular learning outcome across the duration of the internship may provide data on attainment of learning outcomes. In addition,

when programs exercise control over the content of internships, those settings can serve as capstone experiences where students can demonstrate their knowledge skills and abilities.

Portfolio Evaluations

Adapted from the California State University, Bakersfield, PACT Outcomes Assessment Handbook (1999), and the University of Wisconsin, Madison, Outcomes Assessment Manual I (2000).

Portfolios are collections of student work over time that are used to demonstrate student growth and achievement in identified areas. Portfolios can offer information about student learning, assess learning in general education and the major, and evaluate targeted areas of instruction and learning. A portfolio may contain all or some of the following: research papers, process reports, tests and exams, case studies, audiotapes, videotapes, personal essays, journals, self-evaluations and computational exercises. Portfolios are often useful and sometimes required for certification, licensure, or external accreditation reviews.

Portfolios not only demonstrate learning over time, but, can be valuable resources when students apply to graduate school or for jobs. Portfolios also encourage students to take greater responsibility for their work and open lines of discussion between faculty and students and among faculty involved in the evaluation process. Portfolios are, however, costly and time-consuming and require extended effort on the part of both students and faculty. Also, because portfolios contain multiple samples of student work, they are difficult to assess and to store and may, in some contexts, require too much time and effort from students and faculty alike.

Enlist the assistance of assessment and testing specialists when you plan to create, adapt, or revise assessment instruments. Staff in the Office of Curriculum, Learning Design & Academic Assessment (LINK) are happy to assist you in finding the appropriate resources and helping you to design the assessment. Areas in which you might want to seek assistance include:

- ensuring validity and reliability of test instruments;
- ensuring validity and reliability of qualitative methods;
- identifying appropriate assessment measurements for specific goals and tasks; and
- analyzing and interpreting quantitative and qualitative data collected as part of your assessment plan.

Adapted from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006)

IV.5. Step 3: Collect data

Now that you have an assignment(s) that directly measures student learning, how are you going to collect data about student learning using this assignment?

Data collection is the next step in the assessment process. This section will cover the process of collecting student work, rating (or evaluating) work, and storing data. The collection process may seem like a daunting task, but with planning, it can move more smoothly and provide quality data and information about the program's learning outcomes.

Checklist of Materials for Collecting Data:

- ☐ Student work that you've collected
- ☐ A manner to rate the learning outcomes related to the work the student completed
- ☐ Secure electronic database
- ☐ If possible, examples of student work for each performance standard in paper or electronic form.

Adapted from Marymount University Assessment Handbook (2015)

Gathering, Evaluating, and Storing

The data collection process consists of three basic steps:

1. Gathering: gathering necessary student work and other information,
2. Evaluating: evaluating the results, and

3. Storing: storing the data electronically.

Following are some questions to ask in gathering materials, evaluating student performance and storing assessment materials:

- Where is the student work coming from?
- How will the student work be organized and stored for evaluation?
- When will the materials be evaluated?
- Who will be responsible for evaluating the materials?
- How will the performance data be stored? How will it be secured?
- How will examples of student work be stored? Paper? Electronically?

Gathering Qualitative & Quantitative Data

**adapted from Marymount University Assessment Handbook (2015)*

The process of gathering materials for direct measures varies greatly depending on the measures used. For course-embedded measures (such as tests, performance assessments or capstone assignments), it is necessary to coordinate with the faculty member(s) teaching the course to ensure the student work is collected and forwarded for assessment.

Identify the approach used to collect the data, such as:

- A performance assessment with a rubric
- A test or comprehensive exam
- A portfolio with a qualitative evaluation, etc.

Evaluating Student Performance

The evaluation phase for direct measures includes the examination of students' work by faculty to determine whether, and how well, the work achieves the learning outcome. Because assessment looks to evaluate specific aspects of student work, and these aspects must be clearly defined, rubrics are often created and used as guidelines in the process.

Rubrics are standardized evaluation forms used to assess whether and how well student work achieves learning outcomes. Effective rubrics can be developed in many different ways to assist the evaluation process. They can describe qualitative as well as quantitative differences and are often used to assess assignments, projects, portfolios, term papers, internships, essay tests, and performances. They allow multiple raters to assess student work effectively by increasing the consistency of ratings and decreasing the time required for assessment.

A Quick Introduction to Rubrics

Adapted from Ball State University Assessment Workbook (2012)

A rubric is a scoring tool that lays out the specific expectations for an assignment. Rubrics divide an assignment into its component parts and provide a detailed description of what constitutes acceptable or unacceptable levels of performance for each of those parts. Rubrics are composed of four basic parts (University of Connecticut, n.d.):

- A task description (the assignment)
- A scale of some sort (levels of achievement, possibly in the form of grades) (Scales typically range from 3 to 5 levels.)
- The dimensions of the assignment (a breakdown of the skills/knowledge involved in the assignment)
- Descriptions of what constitutes each level of performance (specific feedback)

The University of Connecticut lists the following benefits of using rubrics.

- Rubrics provide timely feedback – grading can be done more quickly. Since students often make similar mistakes on assignments, incorporating predictable notes into the descriptions of

dimensions portion of a rubric can simplify grading into circling or checking off all comments that apply to each specific student.

- Rubrics prepare students to use detailed feedback. In the rubric, the highest level descriptions of the dimensions are the highest level of achievement possible; whereas the remaining levels, circled or checked off, are typed versions of the notes/comments an instructor regularly writes on student work explaining how and where the student failed to meet that highest level. Thus, in using a rubric the student obtains details on how and where the assignment did or did not achieve its goal, and even suggestions (in the form of the higher level descriptions) as to how it might have been done better.
- Rubrics encourage critical thinking. Because of the rubric format, students may notice for themselves the patterns of recurring problems or ongoing improvement in their work.
- Rubrics facilitate communication with others. TAs, counselors/tutors, colleagues, etc. can benefit from the information contained in the rubric (i.e., provides information to help all involved in a student's learning process).
- Rubrics help faculty refine their teaching skills. Rubrics showing a student's continuing improvement or weaknesses over time, or rubrics showing student development over time, can provide a clearer view of teaching blind spots, omissions, and strengths.
- Rubrics help level the playing field. To aid first-generation or non-native speakers of English, rubrics can act as a translation device to help students understand what teachers are talking about.

Storing Qualitative and Quantitative Data

There are two storage tasks to complete in the data collection process:

1. Selecting an electronic storage system
2. Ensuring the security of the information stored

First, you will want to select an electronic storage system wherein all of the information/data and examples of student work are filed. The most sustainable electronic storage system is one that your faculty already know how to use and are comfortable using. Because assessment is a shared endeavor, consider identifying a method that can be shared by faculty. All of the following have been used successfully by faculty across the campus: BlackBoard Learn, Google Shares, a Shared Drive, SharePoint, DropBox, and many others.

Whatever methods are used, it is generally a good idea to back up the files onto a departmental drive. Many programs track direct measures by creating electronic databases/ACCESS/Excel spreadsheets, and statistical packages such as SPSS, etc. to store data for later analysis. The database will typically lists all students completing the measure and their performance on the measure. Remember that if you want to link the assessment data to measures in LOUIE, such as when they took certain classes, incoming HSGPA, etc., you will want to collect their STUDENT ID as well.

Example of a program database illustrates how to compile the database of assessment data:

Last Name	**First Name**	**Year**	**Rubric Row 1: LO5**	**Rubric Row 2: LO4**	**Rubric Row 3: LO5**
Allan	Jane	Senior	4	5	4
Miller	Larry	Senior	5	3	5
Smith	Bob	Senior	3	4	4
Bloom	Desmond	Junior	4	3	4
Jones	Robin	Junior	5	4	4
Smith	Troy	Junior	5	4	5

Second, you want to make sure that the data you collect is secured. Because this database will have individual student information, it is very important to ensure it remains secure and that only faculty and staff involved in the assessment activity have access to the contents. As noted in the section about keeping data work secure, student work is protected by The Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99). To comply with FERPA regulations, student work should either be maintained in a secure system with access limited to those involved in assessment. Only if it is not possible to maintain the data on a secure system should the unit have all personally identifiable information removed. The moment personally identifiable information is removed, no further analyses can be conducted on the data, as the data can no longer be matched to other data that is maintaining within LOUIE, CIVITAS, or other data collection systems at NAU. This can severely limit the ability to use the data to inform decisions and make changes and improvements within the unit.

Additionally, it is recommended that samples of students' work be stored to document the assessment process. Generally for each direct measure, an example at each level of the performance standard should be saved. If possible, scan the student's work, converting it into an electronic file, as electronic copies of student work can reduce space required for storage and allow the original work to be returned to the students.

Enlist the assistance of assessment and testing specialists when you plan to create, adapt, or revise assessment instruments. Staff in the Office of Curriculum, Learning Design & Academic Assessment (LINK) are happy to assist you in finding the appropriate resources and helping you to design the assessment. Areas in which you might want to seek assistance include:

- ensuring validity and reliability of test instruments;
- ensuring validity and reliability of qualitative methods;
- identifying appropriate assessment measurements for specific goals and tasks; and
- analyzing and interpreting quantitative and qualitative data collected as part of your assessment plan.

Adapted from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006)

IV.6. Step 4: Analyze and Interpret Findings

You have collected, evaluated, and stored your data. Now is the time to analyze it. Let's begin by remembering our purpose for analyzing and interpreting findings. An assessment's value to the program lies in the evidence it offers about overall learning outcome strengths and weaknesses, and in the evidence it provides for change. Due to the focus at NAU on Program Learning Outcomes Assessment, the key to interpreting assessment findings is to link the results to the learning outcomes. To accomplish this, please use the following steps to fill out the table of Analyses & Interpretations in the Self-Study Report Template.

Conducting the Analysis

Adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017) and from Marymount University Assessment Handbook (2015)

Analysis is a process that provides better understanding of data and allows inferences to be made concerning assessment findings. It summarizes the data, enhances the value of information gathered by identifying patterns within it, and provides direction for decisions regarding program improvement. While data analysis can be relatively complex, for the purpose of assessment it is usually basic. Assessment's focus on student achievement of learning outcomes typically requires the determination of counts and percentages. Together they show clearly the number of students involved in the activity and the rate of successful display of the outcome. All data, regardless of type can be analyzed using counts.

To begin your analysis, we recommend that you review the data visually. The data you would review includes things like the frequencies, (data results showing how frequently students scored on each aspect of the rubric, or question of the exam), and the data in the spreadsheet. If you collected qualitative data, you will want to skim through faculty members' comments. Reviewing data has two benefits: It allows for the identification of outliers and possible mistakes, and it enables basic patterns or trends to emerge. For

example, it may be clear that all students who took a particular class had difficulty with a particular outcome.

Summarize what you found.

- For rubric or exam data, you will want to:
    - Identify the total number of students participating in the assessment activity for each outcome measure.
    - Identify the percentage of students who met or exceeded the performance standard for each outcome measure.
- For descriptive faculty feedback, describe the patterns and frequencies of faculty feedback for each learning outcome.

The Role of Advanced Statistical Analysis

As a program's assessment activity and data increase, more advanced analysis may be useful in understanding student learning. It is possible to:

- Study differences in performance to examine the effects of curricular change
- Conduct pre and post assessments to evaluate effect of specific learning experiences
- Compare program students to national performance on certification examinations (sometimes these are provided by the organizations providing certification

Implementing more advanced statistical analyses requires that you have a

Interpreting Assessment Results

Adapted from the University of Massachusetts, Amherst "Program-Based Review & Assessment Tools & Techniques for Program Improvement," (April 2017) and from Marymount University Assessment Handbook (2015)

Now that you have summarized your findings, let's determine how to go about interpreting them. In order to interpret results, you will want to consider the following:

- What are the Performance Standards?
- What results do you expect to obtain?
- What crucial questions do you want to discuss with faculty concerning the results?

<u>Establishing Performance Standards</u>

When interpreting assessment results, it is useful to set a performance standard that specifies the acceptable level of student work or response. For each learning outcome the program should ask "What is an acceptable performance standard for this learning outcome?" This performance standard may be a passing score on an exam, a rubric rating of "meets program standards" on a student paper or another indicator of the quality of student work.

Suskie offers the following suggestions for setting specific, appropriate standards:

- Do some research, perhaps with peer institutions or professional associations.
- Involve others in the discussion such as students, employers, and faculty members teaching in other programs.
- Use samples of student work to inform the discussion of setting expectations.

<u>Establishing Expected Results</u>

By setting expected results for the percentage of students meeting or exceeding performance standards before data collection begins, the program can gauge its effectiveness in helping students meet the learning outcomes. For example: Seventy-five percent of students met the performance standard set by the department for the outcome measure on ethical reasoning. This can be compared to the expected result of 85% meeting the performance standard that reveals an area for improvement.

Suskie also offers the following tips for setting targets for collective performance:

- Express targets as percentages rather than means to improve understanding.
- Vary targets depending on the circumstances.
- Consider multiple targets (e.g., at least 90% of students score above the adequate level, and at least 30% score above the exemplary level).

Suskie (2009) identifies the following types of benchmarks or standards for framing expectations (the table below). If you are examining findings for the first time, it is most likely that you will want to ensure you are achieving Local Standards, the Capability Benchmark, and the Strengths & Weaknesses Perspective. If you make changes to your program and then re-assess student learning, you would use the Value Added Benchmark and the Historical Trends Benchmark.

The remaining standards and benchmarks in the table below rely mostly upon coordinating similar assessments across areas. For example, many professions that require accreditation, such as Nursing, Engineering, and Education, have standardized tests that lead to accreditation. One of the benefits of having such tests in place is the capability to determine External Peer Benchmarks and Best Practices Benchmarks.

Types of Benchmarks or Standards

Suskie (2009)

Local Standards	Are students meeting our own standards?
Capability Benchmark	Are our students doing as well as they can?
Strengths and Weaknesses Perspective	What are our students' areas of strengths and weaknesses?
Value-Added Benchmark	Are our students improving?
Historical Trends Benchmark	Is our program improving?
External Standards	Are students meeting standards set by someone else?
Internal Peer Benchmark	How do our students compare to others within Ball State?
External Peer Benchmark	How do our students compare with those of other universities that are similar to Ball State?
Best Practices Benchmark	How do our students compare to the best of their peers?

Which standard or benchmark you should use depends on the purpose of the assessment. For example, in examining the performance of a group of students on a certification exam, you might compare against national norms, against the performance of students in the best programs in the country, or against students at peer institutions if the assessment is being conducted for purposes of accountability or accreditation. Then, you might compare against your own students at another point in time or within groups of students if your purpose is self-analysis and improvement.

Once you determine the performance standards and expected results for the learning outcome, you will want to compare the results with the specified performance standard and discuss the implications of the data as they relate to the program. Both strengths and areas for improvement are discussed, because

showcasing program success is just as important as identifying areas for improvement, when it comes to making data based decisions about the program.

Crucial Questions to Discuss Concerning Your Results

**adapted from Marymount University Assessment Handbook (2015)*

Consider the extent to which your findings can help you answer the following questions:

- What do the data say about your students' mastery of the program's learning outcomes?
- Do you see indications in student performance that point to weakness in any particular content areas, skills, etc.?
- Do you see areas where performance is okay, but not outstanding, and where you would like to see a higher level of performance?
- Are there areas where your students are outstanding? How might you learn from the curriculum design used to develop these learning strengths to improve student learning in other areas?
- Are they consistently weak in some respects? How might you adjust the program's curriculum design to improve student learning in these areas?

These are compelling and central questions for faculty, administrators, students, and external audiences alike. If your assessment information can shed light on these issues, the value of your efforts will become all the more apparent.

Including program faculty in all steps of the assessment process is important to ensure its meaningfulness and effectiveness. The inclusion of faculty insights is probably most important in interpreting results and identifying strategies for improving student learning. The methods used for sharing results is driven by character of the department, with some pouring over all the data generated and others simply reviewing summary analysis outlined in Section IV of the handbook. Using summary reports of assessment results, and the University Assessment Committee's review of the previous year's report will typically facilitate rich discussion and generate useful interpretation for the assessment report.

Enlist the assistance of assessment and testing specialists when you plan to create, adapt, or revise assessment instruments. Staff in the Office of Curriculum, Learning Design & Academic Assessment (LINK) are happy to assist you in finding the appropriate resources and helping you to design the assessment. Areas in which you might want to seek assistance include:

- ensuring validity and reliability of test instruments;
- ensuring validity and reliability of qualitative methods;
- identifying appropriate assessment measurements for specific goals and tasks; and
- analyzing and interpreting quantitative and qualitative data collected as part of your assessment plan.

Adapted from Western Washington University's Tools & Techniques for Program Improvement: Handbook for Program Review & Assessment of Student Learning (2006)

V. Degree Program Expectation: Use of Findings

V.1. Step 5: Use of findings: Select actions to take based on assessment findings and develop a plan to implement actions

In this section, you will discuss planned assessment, curricular or program improvements, and efforts to disseminate information about learning strengths based on your interpretations of the findings. Efforts documented in this section are incorporated into the Future Plans section of the Self-Study Report.

The minimum requirement for this characteristic is to identify at least one of the following three actions for each outcome:

- Improve the assessment
- Improve the curriculum
- Disseminate the findings of learning strengths

Improve the assessment

When academic units are in the developing stages of assessment, it is common to need improvements in the area of assessment in order to obtain actionable results: results that are reliable and valid enough to either (a) use to improve the curriculum, or (b) that the faculty feel comfortable to publicly disseminate.

The areas to consider improving assessment approaches include:

1. Determine where/when to conduct assessment
2. Design outcome measures (assignments, tests, etc.)
3. Collect data
4. Analyze, interpret and evaluate findings

Evaluating Measures

It is possible to evaluate outcome measures by asking the three questions found in Tool 3: Questions for evaluating outcome measure. If faculty and chairs are able to answer "yes" to all of three questions, it is likely that a strong set of measures has been developed.

Tool 3: Questions for Evaluating Outcome Measures

• Does the measure provide sufficient data and information to analyze the learning outcome?
• Does the measure require a reasonable amount of work to collect?
• Does the measure establish performance standards to help guide the analysis?

Discuss planned curricular or program improvements for this year based on assessment of outcome.

This section describes the plan for action for the next year. Planned improvements usually address one of the following areas:

- ☐ Courses supporting learning outcomes
- ☐ Learning outcomes
- ☐ Measures (rubrics, tests, surveys)

EXAMPLE: Improving Outcome Measures

The following illustration shows how the questions in Tool 3: Questions for evaluating outcome measure can be used to evaluate outcome measures. This example builds on the learning outcome developed in section one.

Upon successful completion of this program, students will be able to apply ethical reasoning in discussing an ethical issue.

A department first uses an indirect measure:

Two questions from the Graduating Student Survey:

For each of the following skills, please indicate how well you believe your education prepared you to:

Determine the most ethically appropriate response to a situation.

Understand the major ethical dilemmas in your field.

Students respond to these questions by indicating their choice on a scale ranging from "Poor" to "Excellent."

We will evaluate this outcome measure by asking the following questions:

1. "*Does the measure provide sufficient data and information to analyze the learning outcome*?"
    a. Yes, because this evidence is the student's opinion.
    b. No, because it is an indirect measure and indirect measures are not sufficient by themselves to analyze learning outcomes. It does not look at the student's actual ability to "apply ethical reasoning in discussing an ethical issue."
2. "Does the measure require a reasonable amount of work to collect?"
    a. Yes, the amount of work required is reasonable.
3. "Does the measure establish performance standards to help guide the analysis?"
    a. No, it does not provide a performance standard to help guide the analysis though one could be developed regarding the student opinion.

The department revises the outcome measure to a direct measure, which is the required minimum at NAU (that each learning outcome be assessed using a direct measure of student learning):

A paper taken from student portfolios where the student discusses an ethical issue. The papers are rated by each faculty member on a specific rubric designed to measure the application of ethical reasoning.

We evaluate this outcome measured by asking the same three questions as before:

1. "Does the measure provide sufficient data and information to analyze the learning outcome?"
    a. Yes, the measure directly measures students' application of ethical reasoning.
2. "Does the measure require a reasonable amount of work to collect?"
    a. No, the faculty may object to having to read all the student papers and they may deem this measure too much work.
3. "Does the measure establish performance standards to help guide the analysis?"
    a. No, there is no specific performance standard established.

The department revises the outcome measure to:

Student papers that discuss ethical issues are extracted from student portfolios. Each paper is rated by two faculty members on a rubric designed to measure the application of ethical reasoning. The mid-point of the rubric (a rating of 3) provides a description of the performance standard required by the program. The mid-point states that the paper, "Identifies the key stakeholders, states one ethical approach in their discussion, discusses both the benefits and risks associated with the ethical issue, shows consideration of key stakeholder interests, uses at least one normative principle in discussing the issue."

By revisiting the three questions, the strengths of this outcome emerge.

1. "Does the measure provide sufficient data and information to analyze the learning outcome?"
    a. Yes, the measure directly measures student's ability to apply ethical reasoning.
2. "Does the measure require a reasonable amount of work to collect?"
    a. Yes, It is less burdensome on the faculty to collect the data than the previous outcome measure.
3. "Does the measure establish performance standards to help guide the analysis?"
    a. Yes, it provides a performance standard to help guide the analysis.

*4. *adapted from Marymount University Assessment Handbook (2015)*

Improve the Curriculum

In order to identify how you might want to improve the curriculum, you will want to examine the findings in relation to your curriculum map. There are at least two important areas to consider when reviewing your curriculum map in relation to your findings: examining concept and skill reinforcement, and examining course sequencing.

Examining concept and skill reinforcement

Often programs will discover that students are introduced to a concept or skill in the curriculum, but course assignments and planned experiences are not sufficient to help students master those concepts and skills. This may lead to considering modifications in assignments, readings, or general teaching approaches to reinforce concepts with students. A program may also discover that a new course needs to be created to sufficiently address a learning outcome.

Examining course sequencing

Sometimes faculty will discover that the course provides sufficient support for the student to master the material, but course sequencing should be adjusted so that students are introduced to concepts that build on and complement each other. The student learning assessment process can be used as an audit of the programmatic educational experience.

**adapted from Marymount University Assessment Handbook (2015)*

<u>Case Studies of Faculty Applying Assessment Findings to Improve Curriculum</u>

Following are a set of case studies to demonstrate how various programs have improved their curriculum based on assessment findings. While the level of maturity of the assessment efforts outlined in these case studies varies, the commonality is that all of the units took some action. They did not wait years until enormous amounts of data were collected; they did not wait until they had a perfect assessment design and perfect findings to do something with them; they did not spend years discussing what changes to make to implement improvement. They obtained findings that showed them a pattern in student learning. They gathered additional data if they needed it. They took action to make changes in the curriculum.

Assessment matters and is meaningful when you do something with it.

1. A two-hour, annual faculty meeting is held in a department of political science where each faculty member who teaches seniors described strengths and weaknesses in research papers. Notes were kept. A vote was taken on one follow-up action to mitigate a weakness. The area identified was students' lack of ability to construct coherent research questions. Members of the department curriculum committee followed up to investigate in which earlier courses this skill was covered. They also administered a short survey to seniors that asked which courses helped them to construct research questions and what the faculty could do to help students to improve this skill. It was decided that two junior-level courses would cover constructing research questions in greater depth. A year later a similar meeting was held, and it was determined that students' ability to construct research questions had improved substantially. The faculty members then decided to follow up on another identified weakness.

2. The faculty member who teaches the senior capstone biological research course for biology majors developed a simple scoring system or rubric to evaluate students' research papers. He shared the results at a department meeting. The results showed that designing experiments and controlling variables were the areas of greatest weakness. A small committee examined the curriculum, developed some potential ideas to implement, then held a student focus group to obtain feedback on their ideas and whether students needed additional support in relation to their ideas. They decided to institute a tutoring program that reinforces these areas.

3. Faculty members in health sciences noticed that several students were providing incorrect answers to questions in the final exam of a first-year survey course that required interpretation of written material. They began to suspect that there was a relationship between reading skills and performance in the exam. A student survey and discussions with academic advisors confirmed this relationship. As a result, the faculty

emphasized the importance of reading skills in their first-year survey course, they strengthened a requirement that students who scored below a certain cutoff in a diagnostic reading test enroll in the institution's reading and study skills course, they asked experienced students to discuss with first-year students the importance of study time and effective study methods, and they provided professional development for faculty members in the department to recognize student reading problems early in their courses and to refer the students with such problems to the campus study skills center.

4. Music faculty members reviewed student portfolios and determined that there was wide variation in entering students' knowledge of music theory. They developed a music theory diagnostic test that students took as part of their application process and created a first-semester basic music theory course for students who scored poorly on the test.

. Faculty members offering online MBA courses noticed that some students were not turning in assignments or using the online discussion board. They emailed students a link to a short survey and also asked the institution's IT staff to collect some statistics about students' use of tutorials that were provided to explain how to use the features of Blackboard. It turns out that some students did not understand the basics of how to navigate Blackboard, and they did not complete the tutorials. A new policy was instituted that students would be de-registered from their courses unless a usage report confirmed that they had completed the tutorials and scored at least 80% on a proficiency exam.

While the level of maturity of the assessment efforts outlined in these case studies varied, the commonality is that all of the departments took some action. They did not wait years until enormous amounts of data were collected. They were better off concentrating on a few simple concerns that matter. If a unit collects large amounts of information but does not discuss the implications and use the information to make improvements or disseminate learning strengths, then the process has been a waste of energy. Assessment matters—is meaningful—when you do something with it.

**adapted from Ball State University Assessment Workbook (2012)*

Disseminate Learning Strengths

The primary approach for disseminating learning strengths is to place the learning outcomes, findings and interpretations in the Degree Program Expectations Section of the Academic Catalog, which is provided below. If you expect to disseminate findings in other manners, such as publishing findings on your website, or publishing journal articles for the Scholarship of Teaching and Learning, etc., please identify those in the table and/or discussion.

Identify the outcomes for which you would like to disseminate learning strengths in the following table, including the analysis/findings and interpretations. The table will be placed in the Degree Program Expectations Section of the Academic Catalog. Then, send it to curriculum.assessment@nau.edu for it to be posted in the catalog.

Student Learning Outcome	Analysis/ Findings	Interpretation