Item Name: General Education Quality Review Series

☐ Action Item
☐ Committee Recommendation to Full Board
☐ First Read of Proposed Policy Change
☒ Information or Discussion Item

Issue: The board office asks that the committee engage in a strategic discussion with University Administrators in the fourth of a five-part review series on General Education Quality Assurance at the three Arizona state universities. Following the discussion, the board office asks that the committee determine next steps/course of action.

Enterprise or University Strategic Plan

☒ Empower Student Success and Learning
☒ Advance Educational Attainment within Arizona
☐ Create New Knowledge
☐ Impact Arizona
☐ Compliance
☐ Real property purchase/sale/lease
☐ Other:

Background/History of Previous Board Action
The board and university administrators have engaged in past discussions about general education quality at the three public Arizona state universities with the resulting review series beginning September of 2017.

Discussion
The board will discuss Part 4 of the General Education Quality Review series, which will highlight the quality assurance practices and policies with general education programs and innovation.

Requested Action
The board office asks that the committee engage in a strategic discussion with University Administrators in the fourth of a five-part review series on General Education Quality Assurance at the three Arizona state universities. Following the discussion, the board office asks that the committee determine next steps/course of action.

Contact Information:
Shelley McGrath       602-229-2529       shelley.mcgrath@azregents.edu
This page is intentionally blank
GENERAL EDUCATION QUALITY REVIEW SERIES
ACADEMIC AND STUDENT AFFAIRS COMMITTEE
UNIT FOUR: GENERAL EDUCATION QUALITY AND INNOVATION

INTRODUCTION

What is innovation in higher education? What is the relationship between innovation and quality? These are questions that stimulate and challenge universities and stakeholders alike.

The demand for college degrees is at an all-time high from both the student and employer perspectives, and innovation is critical to sustaining enrollment and increasing graduation rates as employers increasingly seek higher credentials from their candidate pools. The costs to educate have increased within traditional “brick and mortar” models, and efficiencies are an imperative to meeting the demand given the increasing numbers of transfer, non-traditional, and returning students. Additionally, the Arizona Board of Regents has outlined aspirational board metrics targeting student success and the universities are passionately invested in achieving those measures. The traditional brick and mortar educational models are simply unsustainable given the wide open access for students from a wide variety of backgrounds and the extreme budget constraints of large public universities. One way to define efficiency is the practice of providing the highest quality product for the lowest price, and innovations are certainly necessary to achieve this. Innovations are an imperative too as universities anticipate the knowledge and skills for tomorrow’s jobs. Institutions of higher education are working harder than ever to structure teaching, curriculum, and programs to satisfy the dynamics of the fourth industrial revolution. And while certain elements of instruction and delivery may not be considered innovative by definition, it is in fact the combination of elements—the development of an effective system—that is innovative.

In terms of quality, innovation relates to educational activities that are transformative and exceptional. To be transformative is to change policy and practice that positively improves student learning as well as students’ personal and professional potential, while being exceptional holds those practices to the highest standards. The transformative side includes effective pedagogies, clear outcomes, and student engagement; while the exceptional side lends itself to bolstering the status and prestige of the university and arguably the brand.
General education continues to be a valuable piece of the undergraduate curriculum at universities, but many are seeking to restructure general education programs to address 21st century environments and demands. Some of these innovations include re-packaging general education to better demonstrate the value of the curriculum and appeal to the market. One example is the idea of “thematic” general education curriculum, where students select an interest area that includes a package of general education courses that align with the theme. For example, “sustainability” is currently popular in both educational and professional discourse. Students could take a set of courses that achieve general education outcomes overall, but also attract the interest of students, who in today’s world, are shying away from too much choice. With tuition costs at an all-time high, the time for using general education courses to “explore” interests is passed.

Given that students enter college with variable measures of preparation in certain subjects, innovative teaching methods and course structures help students develop greater mastery over the material regardless of the quality of their high school experience. Examples of these innovations may include using online resources such as MOOC’s and/or Kahn.org to supplement instruction, research experiences with faculty, early alert intervention systems connected to student behavior in and out of the classroom, progress related to performance in an online environment rather than “seat time”, and moving away from lectures to interactive engagement with students during the class to name a few.

### INNOVATION AT ARIZONA’S PUBLIC UNIVERSITIES

All three of Arizona’s public universities have implemented innovations to achieve quality learning and developmental experiences for their diverse student body. While some of these innovations have common elements, each university has implemented unique innovations that are described below. A matrix is shown below highlighting the work of the three universities followed by greater detail submitted by each university.

<table>
<thead>
<tr>
<th>Arizona State University</th>
<th>Northern Arizona University</th>
<th>University of Arizona</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital Portfolios</strong></td>
<td><strong>First Year Learning Initiative</strong></td>
<td><strong>Strengths</strong></td>
</tr>
<tr>
<td>- Portfolios are a learning platform in First Year Composition.</td>
<td>- General education courses can be FYLI certified based on their transformative course design that focuses on enhancing student learning and student success. Key features include: Socializing students’ growth mindset, substantial student engagement from the start, early and continuous feedback as well as co-</td>
<td>- The program follows students if they change their majors.</td>
</tr>
<tr>
<td>- Portfolios highlight students’ abilities to address diverse audiences, think critically, use digital technologies strategically, develop habits of mind that foster success, and apply composition skills and knowledge to other academic, professional and civic contexts.</td>
<td></td>
<td>- Faculty from all over in multiple disciplines offer courses giving a meaningful breadth to the general education experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The two-tiered system allows students to earn upper division credit as they advance in to more challenging general education courses.</td>
</tr>
</tbody>
</table>
• Students build the portfolios over time and are able to demonstrate reflection of their learning and exchange ideas beyond the classroom.
• To date, 85,000 students have created 122,000 portfolios over a spectrum of courses.

Course Redesign
• Using predictive analytics, general education courses were identified that are diagnostic of student success with relatively low pass rates.
• Courses included: College Algebra, College Mathematics, Pre-Calculus, The Living World, General Biology, Macroeconomic Principles, Microeconomic Principles, Introductory Chemistry, History of United States, and Introduction to Psychology
• Course redesign includes: Space configuration, instructional technologies, academic assessment, and strategic progress through material.
• Some of these courses include lab stations for students where they advance through the courses through competency-based models in a sequence and must demonstrate competency before proceeding to the next level.
• Faculty and peer mentors provide guidance during and after the class.
• Adaptive learning is also delivered digitally which is much like the competency based model but more interactive with faculty and fellow students.
• These changes show improved performance and curricular community engagement.
• The initiative grew from learning sciences, best practices in course design, and the expertise of campus leaders, faculty, staff, administrators, and e-learning representatives.
• Peer teaching assistants (300) work with these students in order to make sure that students have an active learning experience.
• The FYLI combines evidence-based requirements for course design and delivery, emphasis on reflection and professional development, and peer support.

First Year Seminar & Beyond
• FYS courses are three-credit, FYLI-certified, topics-based seminars, with 25 students per section, taught by highly engaged faculty from across campus.
• FYS serves as the entry point for NAU’s interdisciplinary Liberal Studies program and provides a unique opportunity to transcend disciplinary boundaries and empower all students to expand their horizons. These courses strive to build student resiliency and increase student success by creating a strong sense of academic and community belonging and actively engaging students in their learning experiences.
• Born of the FYS course, the Boundaryless@NAU program prepares students for jobs of the future. They can earn an Innovative Thinking and Problem Solving certificate, which helps students develop innovative and
• Students must write at least 10 pages in each class with feedback and revision required.

Innovations
• Course redesigns that incorporate active learning and include approaches to improve learning have been undertaken across campus in undergraduate foundation science courses, including general chemistry, introductory biology, physics with calculus, as well as in introductory psychology and many other general education courses.
• Active and student-centered learning design has been implemented to lead to improved learning and retention of knowledge and skills development.
• Collaborative learning spaces (30 by fall 2018) are used by many faculty teaching general education courses and foundation math courses. Teaching in these classrooms enhances student learning.
• Faculty professional development has been expanded informally via faculty learning communities (FLCs) and through support from the Office of Instruction and Assessment. In addition to discussing ways to improve teaching, these FLC faculty participate in peer observations to help each other make improvements that enhance student learning.
• Expert and innovative faculty have been recruited and supported to teach general education courses for undergraduates in UA Online programs.
persistence outcomes for students.

Project LEAD
- Three general education courses are integrated with syllabi co-designed by 3 different professors, and cohorts enroll in the same 3 courses which are framed by an underlying context of university life and student success.
- Students learn listening, small group communication, understanding organizations, cultural competence, conflict resolution and public speaking.
- Faculty meet outside the class to assess progress and help students overcome difficulties.
- Outcomes for the project include increases in performance and persistence of students.
- These changes to general education instruction resulted in performance and persistence improvements for low-income and first-generation students.

More Innovations
- A faculty task force is developing a new general education curriculum that will connect courses through large goals that reflect ASU’s aspirations and New American University brand; conduct holistic assessment of the general education program; and incorporate a framework for engagement with American institutions.
- Predictive analytics are providing early and effective interventions by integrating data from PeopleSoft, entrepreneurial mindsets, solve problems, think across disciplines and be prepared for the jobs of the future.

Foundational Courses
- Peak, a summer math bridge program provides mentoring using an online adaptive system so students can improve their math skills and place into a higher math course.
- The Lumberjack Mathematics Center is designed for Freshmen to complete their foundation math and includes the collaboration of staff, faculty, and students, which enhances learning through the use of technology to allow for individualized learning much like a competency-based model.
- The Intensive Writing Lab allows students to experience supplemental instruction in the form of a lab that is a co-requisite with Freshman Composition. This keeps struggling students on track with their peers so that they do not fall behind and delay progress toward their degree. Outcomes show improved performance of students who were registered for the lab.

Foundation Math
- The math department is innovative in designing courses and class schedules that facilitate learning. For example, math partnered with engineering to offer faculty-led supplemental instruction for a pre-calculus class that helped students catch-up and start calculus the next semester. Math teaches a Functions of Calculus course that offers an assessment at three weeks.
- The math department teaches Math 100 online in small synchronis sections to provide additional college math preparation for students who need the help.
- Mathematics has redesigned the college algebra course to align better with peer institutions.
- For majors that do not need college algebra, the math department developed a new quantitative literacy course called Exploring and Understanding Data that provides applications that relate to everyday life.

Capstone Experiences
- Each NAU degree program has designed the capstone to incorporate high-impact experiences providing the means to launch students into the next phase of their professional and civic lives. The students are able to synthesize skills and knowledge acquired in prior coursework by adapting it to specific contexts.
Blackboard, Salesforce and Civitas.
- The Global Freshman Academy is a set of general education courses in algebra, pre-calculus, English composition, social sciences, health and wellness, Western civilization, astronomy, computer programming, and sustainability, that are offered throughout the world and give students a head start on their college education.

**Adaptive Courseware**
- This type of courseware is embedded in general education courses and allows students to learn through tailored learning paths and help accelerate student learning and progress. At its core, it is personalized learning at scale that uses an integrated system of learning tools, assessment methodology and highly structured learning activities.

**Personalized Learning and Liberal Studies**
- This approach is competency based and students work with faculty mentors to proceed at their own pace through modules that build on prior learning and progress. One feature of this system is that it helps students make connections between different disciplines and their major coursework.

**Foundation Freshman Composition**
- Freshmen Composition offers courses that help students improve their writing based on their current skills. For example, they offer a 4 credit ENGL 101A course that offers more time to learn writing skills than the 3 credit traditional ENGL 101 course. They also offer three semesters of ENGL Comp (106, 107, and 108) for students whose native language is not English and need more work in writing to be successful in college.
- Honor students take ENGL 109H which is only one semester and taught on a higher level than the other ENGL Comp classes.

**Future General Education Program**
- Beginning January 2018, a task force began to review the current general education program. A major redesign is anticipated, but it is too early to know what changes will emerge.

---

**Arizona State University**

The faculty at ASU are conducting a comprehensive review of general education, including teaching practices, content management, curriculum design and student behavior. In so doing, the faculty recognize that individual students learn in diverse ways and at different paces, technology can inform and enhance student learning, effective education is student-centric, and assessments should inform subsequent decisions on how to improve the educational experience. The discussion that follows focuses on exemplar innovations at ASU, including the use of digital portfolios in the sequenced courses in rhetorical composition, adaptive and active learning in foundational general education courses, and the integrative curriculum in Project LEAD. The discussion concludes with future directions in general education reform at ASU: thematic approaches to a coherent learning experience, the use of technology to track student behavior, and wide access to general education through the Global Freshman Academy.
**Digital Portfolios**

Digital portfolios allow students to take ownership of the learning process by encouraging them to think about their learning experiences in the broad context of education, community responsibilities and career. They provide a record of where a student has been, where a student is, and where a student would like to go. The portfolios have resonated with students and faculty alike. Since their introduction three years ago, 122,000 portfolios have been created by over 85,000 users in 6,000 course sections.

The portfolios have been a cornerstone of the courses in First Year Composition, where the students are introduced to the importance of writing in academic achievement. The students build strong foundations in critical reading, thinking and writing that will serve them well throughout their academic and professional careers. The digital portfolios support the writing programs in three distinct ways:

- showcasing writing students’ and teachers’ best work;
- assessing the efficacy of the curriculum in helping students develop effective writing strategies and habits; and
- developing an archive of student writing to support research on how students learn to write for a range of audiences, purposes and contexts.

In their digital portfolios, students demonstrate a range of learning outcomes such as their skills in addressing diverse audiences for diverse purposes in diverse contexts, thinking critically, controlling conventions of texts, and using digital technologies strategically. They also demonstrate how they are developing habits of mind that foster their success. Digital portfolio reflective practices can also help students transfer composition skills and knowledge to other academic, professional and civic contexts. Portfolio-based reflection is particularly effective when students have opportunities to reflect on their learning throughout the course, and when those opportunities are deliberately embedded in the curriculum. In addition, researchers have found that learner “disposition” is crucial to the transfer of writing skills. Digital portfolio reflections tied to productive habits of mind can help foster successful habits and behaviors and assist students in setting goals for ongoing growth.

The portfolios live beyond the courses in rhetorical composition. Students continue to develop their portfolios during their studies at ASU, adding examples of their best work that demonstrate what they have learned and how they can use what they have learned. Digital portfolios can include resumes, course work, research, resources and accomplishments that represent an individual, group or institution. They can include text-based, graphic or multimedia elements archived as electronic media. Organizing and curating digital portfolios encourages personal reflection on learning, and the accessibility of portfolios on the Internet facilitates the exchange of students’ ideas beyond the classroom.
As indicated by their growth and scope, with now over two million pages across all of the ASU portfolios, students appreciate the learning experiences afforded by digital portfolios. As one student notes in her portfolio, “I have become more comfortable in my web design skills, learned the importance of the creative process behind writing, and have learned how to create multimodal projects. [. . . ] I have become more confident in my abilities as a writer and have acquired many skills from the WPA Outcomes and Habits of Mind that can be applied to all other areas of life.” Writing, as a core competency, is a way of communicating, knowing and interacting with others on the public sphere. Through effective writing, students learn to synthesize and analyze multiple points of view, articulate and support arguments, and adjust messages for multiple audiences, purposes and conventions.

Course Redesign

In 2007, ASU launched the ambitious project known as eAdvisor, a comprehensive approach to student success. The eAdvisor suite has many dimensions, including degree search, major and career exploration, milestones and benchmarks, but one of its most important features is Critical Tracking, wherein key courses are marked as “critical,” or diagnostic of student success in the major. Almost all of the critical courses are foundational not only to the major, but also the student’s general education.

Using predictive analytics, researchers at ASU identified general education courses that are diagnostic of student success and had relatively low pass rates. Each of the identified courses fulfills one of ASU’s General Studies requirements and also introduces students to concepts important in the respective area of academic study. That these courses had unsatisfactory rates of success is problematic. Students encountering obstacles at the beginning of their college experience are more likely to drop out. ASU sought ways to make these students successful without sacrificing content or rigor by engaging in course redesign. The specific courses to date include:

Math 117 College Algebra. Covers linear and quadratic functions, systems of linear equations, logarithmic and exponential functions, sequences, series and combinatorics.  
**Fully Implemented**

Math 142 College Mathematics. Students apply basic college-level mathematics to real-life problems. Topics include numerical reasoning, sets, counting techniques, probability, basic statistics and finance. **Fully Implemented**

Math 171 Pre-calculus: STEM. Robust treatment of advanced algebraic skills and trigonometry. Topics include functions, compositions, inverses, transformations, complex numbers, roots of polynomial functions, rational functions and exponential and logarithmic functions. **Pilot**
Biology 100 The Living World. Students are introduced to the natural science of biology through the study of living forms, cells, and the evolution of living structures. Fully Implemented

Biology 181 General Biology I. Students are introduced to biological concepts and the interplay of structure and function at the molecular, cellular and organismal levels. Pilot

Economics 211 Macroeconomic Principles. This course focuses on basic macroeconomic analysis, and students are introduced to economic institutions and factors determining income levels, price levels and employment levels. Piloted and Scaling

Economics 212 Microeconomic Principles. This course focuses on basic microeconomic analysis, and students are introduced to theory of exchange and production, including the theory of the firm. Piloted and Scaling

Chemistry 101 Introductory Chemistry. Elements of chemistry are introduced from a general education perspective, and the content has been adapted to meet the needs of students in nursing and kinesiology and those preparing for general chemistry. Fully Implemented

History 109 United States to 1865. Students learn about the growth of the Republic from colonial times through the Civil War period. Piloted and Scaling

Psychology 101 Introduction to Psychology. Students are introduced to major areas of theory and research in psychology, including mental health, how the brain works, social relationships, cognitive processes and developmental and change processes. Piloted and Scaling

The course redesigns are comprehensive, including the use of space, instructional technologies, academic assessment, and strategic progress through material. To facilitate the project, the old library was redesigned and redeployed. New classrooms were built with a focus on student engagement and faculty-student interaction. In the math courses, for example, rather than students seated in rows facing a teacher who would talk about mathematical concepts or show students how to perform mathematics on a whiteboard, the students are seated at individual stations with computers that are programmed to measure competencies at each step. A student cannot move from one concept to the next without demonstrating competency in the task on hand, a vital component of learning that is, of necessity, sequential. The classroom is staffed with the instructor in charge and peer mentors. When students have questions or are struggling with a concept, they signal need for assistance. Often, the peer mentor is able to guide the student through the process. If a student has a larger challenge, the instructor can assess the dilemma and determine the most appropriate course of action. At all times, both the student and instructor are provided data on learning objectives mastered and not-mastered by
the student. When needed, attention is focused precisely on what an individual student needs and precisely when that student needs it. The learning is personalized, at scale.

The other courses blend even more interaction with adaptive learning. Course content previously delivered in lecture format in front of hundreds of students is now delivered digitally. Like math, students progress through the content in short blocks after which they are assessed. If they have displayed mastery, they move on. They are expected to have mastered all required content before they meet in class where they interact in their groups applying the content they learned to solve complex problems. The learning is engaging, and the students begin using their knowledge in ways that will be expected of them throughout their lives.

Initial efforts over the past three years have shown that adaptive learning substantially increases success rates in the respective courses while at the same time the academic standards have increased. The redesigns are in various stages of implementation, and APPENDIX 1.A highlights student performance. The percent of students passing the course across all disciplines has increased dramatically. Moreover, the percent of students demonstrating mastery, defined as achieving a grade of B or better, has increased even more. This is important to retention as students who earn above a 2.5 are retained at much higher rates. Especially noteworthy, the pass rate in College Algebra has improved from ~69% to ~78%, and given the success rates in re-designed College Algebra, the developmental math course has been discontinued. In the blended section of Principles of Microeconomics, 80% of the students passed, 65% earning a B or better compared to 73% and 45% respectively in lecture based courses. The success rate in the blended psychology class was even higher, where 96% of the students passed and 87% received a B or better. In comparable lecture-based psychology courses, 80% of the students passed but only 58% achieved a B or better. In psychology, class size averaged 220, indicating the ability to scale the classes. The economics courses and the psychology course are among the largest enrollment classes at ASU with annual enrollment in the courses nearly 20,000.

Learning gains are not measured by grade performance alone. In two of the courses, pre- and post-tests were conducted in the blended course and the traditional lecture hall version of the course, several times taught by the same instructor. Students in the blended classes achieved higher post-test scores and the highest growth between pre- and post-test. In short, adaptive learning substantially increases students’ attainment of expected learning outcomes.

Project LEAD

A key element of the ASU Charter is inclusivity. Success is measured not by whom we exclude, but by whom we include and how they succeed. Whereas some major research universities might filter applicants and admit only those predetermined to excel, ASU welcomes all qualified students. The inclusivity includes a commitment to innovation, meeting students where they are, and providing a general education foundation that promotes achievement.
To advance achievement for all incoming freshmen, ASU implemented Project LEAD (Learn • Explore • Advance • Design), a program that integrates three general education courses and thus more effectively facilitates learning of course concepts and further develops students' critical thinking and communication skills. In its primary design, Project LEAD integrates the following three courses:

ASU 150 The LEAD Project I. Students develop in academic areas while gaining essential career skills in creativity, problem solving and teamwork. Students learn how to think critically and manage a project from inception to completion. Through course discussions and assignments, students examine connections between their work in other courses and ASU 150.

UNI 110 Critical Reading and Thinking. Students focus on critical reading and writing, with attention to synthesis of materials across disciplines and the exploration of dissent.

COM 100 Introduction to Human Communication. Students learn basic concepts of human communication, processes and environments. Communication topics are surveyed related to culture, identity, organizations and relationships. Students gain a fuller understanding of appropriate and effective communication based on theoretical concepts and their application.

The faculty teaching these three courses co-designed the syllabi to align content and learning outcomes, with an underlying context of university life and academic success. Topics include listening, small group communication, understanding organizations, cultural competence, conflict resolution and public speaking. The students do not only learn about these topics, they learn how to do them.

A second design feature of Project LEAD is that the students are in cohorts of no more than 50 students per group, and the faculty meet on a regular basis to assess individual student progress and case manage students facing difficulties. A student with a problem in one class will often have the same problem in other classes, and the faculty can work together to resolve the situation. Project LEAD continues in the second semester with courses specific to the students’ majors.

The results have been extremely promising. Increases in retention and GPAs occurred each term since the initial pilot in the 2014 – 2015 academic year. In the first year, 250 students participated, in 2016, the participants increased to 590, and 845 students are participating this year. Fall 2017 LEAD students with the greatest opportunity for success retained to spring semester at a higher rate (93.8%) and achieved higher academic success (average GPA of 2.80) than their peer group (89%, and 2.35 GPA). APPENDIX 1.B shows student achievement in terms of retention, and APPENDIX 1.C shows grade point average relative to similar students not in Project LEAD.
Achievement Gap

Evidence is accumulating that innovations in general education improve the success of students across the full spectrum of ASU’s student body, transforming the achievement gap into an opportunity. As shown in APPENDIX 1.D, retention and graduation rates of Pell and first-generation students have begun to improve significantly since 2012 relative to their peers. At the same time, students from all backgrounds also have met with substantially higher rates of retention and graduation success since 2007.

In Math 117 College Algebra, as a case study, the newly revised adaptive learning approach has paid high dividends as shown in APPENDIX 1.E. It is a common practice nationally to require students to take developmental math before moving into college algebra when they do not have sufficiently high math placement scores, as was the case at ASU before using adaptive courseware from ALEKS. Prior to the course redesign, students at ASU with low placement scores were required to pass a developmental math course before enrolling in College Algebra. And yet, the pass rate in College Algebra for these students who are Pell and first-generation was 48.8%. Following revision, students at ASU with initial low placement scores have been mainstreamed into MAT 117 College Algebra. These students only receive remediation on learning objectives when and where they need it. ALEKS directs them to the pre-requisite content needed to progress. The pass rate of all students rises dramatically post-ALEKS with the largest gains for students who are Pell and first generation who had an initial low placement scores. They improve almost 18 percentage points.

New Directions

The ongoing innovations in general education at ASU include a thematic pathway for foundations of learning, advanced application of predictive analytics to modify unsuccessful student behavior in general education courses, and the Global Freshman Academy. The projects described above will continue to be refined as new directions are pursued.

The current General Studies curriculum is designed to provide students with a solid core of knowledge. Critical learning skills include proficiency in the use of language, mathematics and quantitative methods as tools for acquiring, renewing, creating and communicating knowledge. A broad education includes an understanding of the methods and concerns of traditional branches of knowledge — the arts and humanities, social sciences and natural sciences. Developing perspective requires historical, global and cross-cultural examination of knowledge of all kinds.

The problems with the current model are that the courses remain largely unconnected and there is no point in time where the faculty can conduct a holistic, comprehensive assessment of competencies in the general education curriculum. To address this challenge, the University Provost, in collaboration with the Academic Senate, appointed a task force of faculty who
would: a) organize general education around large goals that reflect the aspirations of ASU as a New American University; b) design general education around competencies in critical thinking, quantitative reasoning, written and oral communication, the scientific method and other cornerstones with a focus on outcomes rather than inputs or check sheets; c) incorporate critical reflections on American institutions as a framework for informed civic engagement; and d) implement comprehensive platforms such as portfolios that allow for holistic assessments of student learning and the hallmarks of an ASU education.

The committee is developing an innovative, scalable model that presents students with a choice of themes in which ASU has expertise, an introductory course constructed for the theme, and a select menu of courses that focus on inquiry and critical thinking, collaboration within and across disciplines, innovation and the intellectual habits of creativity, and engagement with American institutions as a basis of social change. In this design, faculty use technology to collect and organize student products, and each student selects a theme-based course that becomes the platform for a holistic, integrative project that serves as a culminating experience for the student and assessment site for the university.

A second area of innovation related to general education is the advancement of analytics to ensure students build strong foundations in learning behaviors. Early intervention in first-year courses is key to student success, and class attendance is an early, effective indicator of successful student behavior. Students who skip classes are more likely to fail than students who go to class, and this was the impetus for an early intervention project launched in fall 2016. Faculty in select first-year courses reported all absences during the first two weeks of the semester, and using the technologies in ASU’s student success suite – an integration of the student information system (PeopleSoft), learning management system (Blackboard), customer relation management (Salesforce) and analytic model (Civitas) – cases were created for advising outreach and intervention. ASU researchers are now correlating academic status reports with other retention indicators for refining outreach strategy, evaluating the impact of interventions based on student outcomes, analyzing all early interventions to understand the significance of multiple early warnings for an individual student within a class, and focusing on student behavior in specific courses highlighted by Civitas Illume to inform best practices.

The Global Freshman Academy is a reflection of ASU’s commitment to make high-quality general education courses available to students throughout the world. Through this innovative platform, ASU faculty have created courses in college algebra, precalculus, English composition, sociology, human origins, principles of engineering, health and wellness, sustainable technological systems, macroeconomics, Western civilization, computer programming and astronomy. For some, general education is a matter of lifelong learning. For others, it is a way of repairing a false start in college, and for many, the Global Freshman Academy will be a way to get an early start in completing a baccalaureate degree. Regardless of the student’s individual goals, the general education courses in the Global Freshman Academy promote
critical thinking, evidence-based reasoning, and the broad intellectual skills needed for personal, academic and professional success.

Northern Arizona University

Northern Arizona University nurtures educational innovation at every level, including within the Liberal Studies (general education) Program. The Liberal Studies Program takes a multi-pronged approach with activities focused on improving student learning, engaging students beyond the traditional classroom, and enhancing progress to degree completion. Innovation has strengthened NAU’s foundational areas, such as Math, English and First Year Seminar courses, as well as the high-stakes integrative capstone courses. We strive to immerse faculty and students in emerging technology and teaching and learning techniques that engage students with increased learning effectiveness, leading to greater prospects for success after graduation. Students’ progress in becoming self-directed learners, critical thinkers, and effective communicators translates into more attractive graduates for both employers and also graduate schools. This document provides a few examples of the innovative perspectives brought to Liberal Studies at NAU.

NAU’s Liberal Studies Program incorporates a breadth of learning to ensure students obtain a wide variety of perspectives and means of expanding knowledge through its Distribution Block requirement (Cultural Understanding; Science; Aesthetic and Humanistic Inquiry; and Social and Political Worlds). Each Distribution Block has a well-articulated purpose statement and set of learning outcomes which guide the development of Distribution Block-designated courses. Overlaid on the Distribution Block requirement are the Liberal Studies Essential Skills—aligned with outcomes employers seek in college graduates. All Liberal Studies courses integrate at least one Liberal Studies Essential Skill, so that students have multiple opportunities to develop their critical thinking, oral communication, writing, quantitative reasoning, scientific inquiry, and aesthetic and creative thinking skills. In addition to students working on the mastery of these skills in Liberal Studies courses, the majority of programs also explicitly integrate these skills throughout their degree requirements.

First-Year Learning Initiative (FYLI)

The First-Year Learning Initiative (https://nau.edu/provost/vp-tlda/fyli/) certifies many Liberal Studies courses. Through the process of certifying courses, faculty members think deeply about their approaches to teaching and learning, the importance of student success, and transformative course design, and they turn these reflections into tangible changes in course structure and delivery. Multi-section courses are required to follow consistent approaches, overseen by a designated course coordinator, ensuring consistency across sections and semesters. This innovative program grew out of learning science, best practices in course design, and the wisdom of experience from a dedicated group of campus leaders: faculty, staff, administrators, and e-learning representatives. FYLI is both a set of criteria having to do with structure, organization, and delivery of a course, and it’s also a methodology, designed to
promote innovation. Key features include socializing students to establish growth mindset (attitudes to support success behaviors), substantial student engagement from the first week on, early and frequent feedback, and co-curricular and community engagement opportunities. When students engage fully in their FYLI course, the positive outcomes transfer to other classes, leading to persistence, student satisfaction, and retention.

As of 2018, there are 89 certified FYLI courses in over 40 departments. The FYLI Peer Teaching Assistant (TA) program fuels the program’s popularity. The Peer TA program provides a paid undergraduate Peer TA for each section of a certified course, making active pedagogy in large-enrollment classes possible, while simultaneously providing Peer TAs with the opportunity to develop career and leadership skills. FYLI currently employs 300 Peer TAs per year, making it one of the largest and most extensive peer teaching programs in the country.

FYLI is unique among initiatives. Its combination of evidence-based requirements for course design and delivery, emphasis on reflection and professional development among faculty, coordination of multi-section courses, and Peer TA support represents a new and effective way to transform Liberal Studies and other gateway courses across an entire campus. Through FYLI, NAU has changed the way we teach first-year students, putting them on the road to success.

First Year Seminar (FYS)

NAU, through its First Year Seminar programming, is one of the leading institutions in the nation to weave transition-to-college program skills, engaged learning practices and liberal studies outcomes into one unified design taught by dedicated faculty through a diverse array of high-interest topics (https://nau.edu/provost/vp-tlda/fys/). FYS courses are three-credit, FYLI-certified, topics-based seminars, with 25 students per section, taught by highly engaged faculty from across campus. This program serves as the entry point for NAU’s interdisciplinary Liberal Studies program and provides a unique opportunity to transcend disciplinary boundaries and empower all students to expand their horizons. These courses strive to build student resiliency and increase student success by creating a strong sense of academic and community belonging and actively engaging students in their learning experiences.

Student perceptions of NAU’s innovative approach to this component of the Liberal Studies Program and its positive impact are overwhelmingly positive. Students indicate that participation in the FYS helped them to make new connections to peers, faculty, and their community and that the program is academically challenging, providing them skills that were useful and made them more aware of their own learning process and how to improve it. Students also indicated that FYS helped them to transition from high school to NAU, find meaning or purpose in the college experience, connect what they learned in college to future goals and influenced them to continue to pursue a degree at NAU.
The FYS has spawned even further innovation. Born out of an FYS course, the **Boundaryless@NAU** program prepares students for jobs of the future through inspiration, education, and connection ([https://nau.edu/boundaryless/](https://nau.edu/boundaryless/)). Students can earn an Innovative Thinking and Problem Solving certificate, which helps students develop innovative and entrepreneurial mindsets, learn how to be problem solvers, think across disciplines, and be prepared for the jobs of Arizona’s future. The entry level courses, part of the Liberal Studies program, help students develop skills in research, effective communication, networking, observing, associational thinking, and critical thinking. The curriculum was designed in light of feedback from alumni and industry concerning the need for students to leave college prepared for the modern day and rapidly evolving workforce. The courses invite students from all majors to form interdisciplinary teams and develop and implement solutions to pressing challenges. Throughout their college career, the students will be engaged in the Boundaryless@NAU innovation commons located in the student union. The commons provides ongoing support in idea generation, project management, and networking to faculty and community mentorship.

Some sample student feedback and comments:

- “My entire college experience has been forever changed by my involvement in this project…. I never expected to become so deeply involved…I would have never met such great friends and would have never experienced meeting with such important groups/individuals…this app has provided me with something wonderful to put on my resume and given me so much experience in PR, which is the core part of my major. I hope to continue this project/passion well after college as well.”
- “I learned that it is sometimes okay to share responsibility and delegate tasks…I have learned that teams can be much more effective for certain projects… I learned the value of teamwork.”
- “This experience has impacted my education greatly as I was able to meet new and greatly smart people and teachers in the process along with growing as a person.”
- “This experience has greatly impacted my education. Through this project I have been able to get more out of my education. I have learned lifelong skills I would never have learned from just sitting in a classroom. I now have received an education that is priceless”
- “Personally, I have gained so much insightful information regarding public speaking and working on interdisciplinary projects.”
- “I have gained so many skills through this process, and I have already seen them benefitting me in other aspects of my life.”
- “I have also learned the benefits of working with other departments on campus. Getting other opinions involved can only expand concepts and increase clarity, and it has been wonderful to work with so many individuals and organizations!”
Foundational Courses (Math and English)

The **Math Summer Bridge Peak Performance** (Peak) program seeks to improve first-year and transfer students’ academic and social success by increasing their confidence in mathematics, helping them improve their math placement, and providing a transition-to-college experience ([https://nau.edu/cefns/natsci/math/student-resources/peak-performance/](https://nau.edu/cefns/natsci/math/student-resources/peak-performance/)). Peak offers a free mentoring service, primarily to new freshman students, during the summer before their first semester. Using an online adaptive system and guided by a personal coach/mentor, students improve their basic math skills—and this experience often leads to raising their math placement level upon retaking the placement test. In addition, students gain a valuable introduction to NAU and resources to aid in their academic success. Using the same adaptive technology that is used in the Lumberjack Mathematics Center, motivated students can jumpstart their critical journey of learning mathematics. Acceleration of mathematics learning is particularly important for students in STEM tracks. In recognition of the impact of this approach, the Online Learning Consortium honored Peak with the Digital Learning Innovation Award ($100K) in 2016.

The faculty, staff and infrastructure of the **Lumberjack Mathematics Center** (LMC) work together to support the mission of the NAU Liberal Studies Program: *to cultivate informed, responsible, productive, and self-reflective citizens of the world.* Each NAU student is required to successfully complete a Mathematics Foundation course. For many students, the path to satisfying this requirement begins in the LMC. The courses taught in the LMC are designed with the first-year student in mind, adhering to NAU’s First Year Learning Initiative guidelines to enhance learning through the use of technology and to allow for individualization.

The four LMC courses were redesigned in 2012 according to National Center for Academic Transformation (NCAT) standards (see Appendix 2.A). Features of the course design that contribute to student success and efficiency include the following: providing online lessons that allow students to benefit from a “flipped classroom” model, to work ahead of the schedule and to complete more than one course in a single semester; incorporating active and cooperative learning strategies with a focus on discourse and growth mindset into the face-to-face meetings; replacing scheduled “seat time” with flexible lab (work) time; incorporating online homework that gives students immediate feedback, remediation, and multiple attempts; incorporating online tests and quizzes that allow for multiple attempts and individualized remediation between attempts; developing a lab space with well-trained tutoring staff to support student learning and progress.

The Lumberjack Mathematics Center moved into a large custom-designed space in the new Student and Academic Services building starting in the spring 2016 semester. The core of the LMC is a 258-seat computer lab staffed with undergraduate tutors, graduate teaching assistants (GTAs) and faculty. The tables in the four classrooms are arranged in groups of four to encourage cooperative learning and student engagement (see Appendix 2.B). The space includes a 55-seat testing room with proctoring services provided by GTAs. This cutting-edge
space is a highlight of the NAU Mountain Campus and has been an essential stop on tours by visitors with an interest in adaptive courseware and innovation in teaching and learning. Success in subsequent mathematics courses is an authentic measure of the LMC’s impact (see Appendix 2.C).

In foundational writing instruction, the **Intensive Writing Lab** (ENG 107) is designed to facilitate the success of academically “at-risk” students. Students take a one-unit, co-requisite, supplemental instruction course along with ENG 105, NAU’s foundational first-year composition course. ENG 107 is taught by upper division undergraduates majoring in English or English Education. Students work with their Peer Instructor through the writing process of six major writing assignments—each with multiple drafts—over the course of the semester. The one-to-one sessions allow for students and Peer Instructors to develop comfortable, enduring relationships and the students move through the writing process without the isolation that often frustrates this particular population.

ENG 107 serves 4.5% of the traditional freshman population from a variety of backgrounds: lower socioeconomic status, “generation 1.5” students, non-native English speakers and first-generation students. In academic years 2015 to 2017, ENG 107 enrolled 64.6% first-generation students compared with the mainstream freshman cohort, which enrolled 45.9%. Students who took the innovative ENG 107 saw higher success rates (96.9%) in ENG 105 compared with matched non-participants (91.4%) and ENG 107 students had the lowest DFW rate (3.1%).

The Intensive Writing Lab’s originality stems from its unique combination of the studio-style writing center and supplemental instruction methodologies. Because of the program’s success with students, peer instructors, and faculty, it could serve as a model for other institutions. It is portable, adaptable, and successful.

**Capstone Experiences**

A high-stakes, innovative feature of NAU’s Liberal Studies program is the **capstone**, which serves as a culminating experience in both the LS program and also the major. Capstones are aligned with one of the four Liberal Studies distribution blocks and with a minimum of two of the program’s essential skills. This experience represents a unique feature of the Liberal Studies Program: the vertical and lateral integration of the program within disciplines for majors and non-majors alike ([https://nau.edu/Provost/VP-TLDA/Liberal-Studies/Culminating-Experiences/](https://nau.edu/Provost/VP-TLDA/Liberal-Studies/Culminating-Experiences/)).

Each NAU degree program has devised the capstone to incorporate high-impact experiences that provide a means of launching students into the next phase of their professional and civic lives. Students in these capstones synthesize skills and knowledge acquired in previous coursework by adapting it to specific contexts. The examples that follow illustrate how capstones move students to engage with their learning in unique ways.
In Engineering, the Design4Practice Engineering Capstone brings together students from mechanical, environmental, civil, and/or electrical engineering majors to form multidisciplinary teams that work with clients/stakeholders to research, design, and/or build a wide range of products. Students apply the tools learned throughout their engineering academic career during a two-semester capstone program. In the first semester, students identify client/stakeholder needs and plan for the implementation phase. During the second semester, students build and prototype designs or conduct research, much as they will do as professionals.

In the Public Relations capstone, small teams of students work with clients to devise strategies to improve their business communication strategies using all manner of traditional media and innovations afforded by social media—again, in imitation of the actual working world. A Creative Writing capstone engages its students in the professional business of producing a new issue of a glossy, online literary magazine, The Tunnels. Students apply all they have learned about the literary arts and multiple genres as part of a collaborative editorial team. Students also acquire other professionalization opportunities that support the transition from undergraduate to post-graduate life. One alumnus of that course observed, “[the capstone] gave me an actual insight into life beyond college . . . It gave us an opportunity to get firsthand knowledge of the kind of atmosphere we would be facing once we were out of college and into the career field. I’m glad that this class gave me a glimpse into what I can expect in the industry and it encouraged me to branch out and find internships and other things that could actually land me a career instead of simply a degree.”

One Psychology capstone—which also provides a coterminus academic structure for students to prepare, reflect and dialogue on internship experiences—places seniors in fieldwork internships where they must adapt their learning in responsive and reflective ways to the needs of the organization and client base being served. The professor of this course reports that in recent experience, one in four students found themselves employed by their internship hosts at the end of the experience. One alumnus of that program wrote to the professor, “I wanted to update you and say thank you for the opportunities your course gave me last year. The experience I gained in your course helped me to get the job that I have now. I am working as a youth counselor at an adolescent behavioral health center in the Los Angeles area . . . Your course prepared me to walk into an interview as my most confident self, while not knowing if I were going to be accepted. I took this into my current job and have been able to thrive within my position because of this confidence. I learned how to present myself both on paper and in person because of your course. I am excited to see what the future will hold for me, and will continue to take with me all that I gained from your course.”

Adaptive Courseware

Digital learning innovation is embedded in Liberal Studies courses through adaptive courseware. Adaptive systems use large data sets across a spectrum of students, informed by learning science theory to present individual instruction and tailored learning paths intended to
accelerate and improve student learning and progress. Adaptive Learning at its core is personalized learning at scale that uses an integrated system of learning tools, assessment methodology and highly structured and intentionally designed learning activities. The goal is to dynamically provide the right content to the right student at the right time. When this goal is achieved, each student will learn new material, or remediated material, when they need it, presented in a manner they are prepared to consume at the time they are ready for it.

With support from APLU since 2016, NAU is working with over 25 100- and 200-level Liberal Studies courses (plus a few other gateway courses) for tremendous impact. Impacts include reduced material costs for students and increased pass rates. We expect over 25% of all introductory Liberal Studies course enrollments will use adaptive courseware by AY19-20.

Personalized Learning and Liberal Studies

**Personalized Learning (PL)** is the unique competency-based education approach developed at NAU. Students, guided by faculty mentors, proceed at their own pace through modules that build both on students’ prior learning and also the requirements of their chosen discipline. The liberal studies program for PL is a prescribed selection of NAU courses. Liberal studies requirements are innovatively integrated into the students’ lessons to provide multi-dimensional perspectives on the topics the students would study throughout their time with Personalized Learning. The student’s dashboard alerts them to the interdisciplinary connections. Using a “May we recommend” approach, when students complete a lesson, the modules point out other lessons from their program of study that align in some way. PL students report the “May we recommend” approach helps them make connections between courses and different disciplines that weren’t immediately obvious to them. Some also say they enjoyed their Liberal Studies courses more because the recommendations helped them see how the different disciplines connected with their major coursework. Many PL students are unable to attend a traditional university campus due to their geographical location, work schedules, or family responsibilities, so having the ability to complete their entire Liberal Studies program of study online is critical. Without this innovative PL approach, they might not be able to attend a program at all.

**Going Forward**

Consistent with a culture of continuous improvement efforts, NAU extended the concept of academic program reviews to the Liberal Studies Program. NAU’s Liberal Studies program is engaged in a year of self-reflection as individuals from across the institution and from the Liberal Studies Committee conduct a self-study of the program. We look forward to engaging with external reviewers when they visit campus next fall semester.
University of Arizona

The University-Wide General Education Program at the University of Arizona was initiated in 1993 with revisions in 1998. In addition to foundation courses in math, English composition, and second language requirements, the general education program includes two tiers of general education courses. Tier I courses include the three categories of Traditions and Cultures (~humanities), Individuals and Societies (~social sciences), and Natural Sciences (~life sciences and physical sciences). The Tier II categories are Natural Sciences, Humanities, Individuals and Societies, and Arts. At least one course must satisfy the diversity requirement in the areas of gender, race, class, ethnicity, sexual orientation, and non-western studies at either the Tier 1 or Tier II levels. In addition, the Honors College offers specific general education courses, and students may flip the number of required Tier level courses and take six Tier II classes and three Tier I classes to satisfy the requirement.

Strengths

There are several significant strengths of the UA general education program. One of the major strengths of the general education program at the University of Arizona program is that the same program applies to all undergraduate majors. This allows students to change majors without losing ground on their general education requirements and course completions. Another strength is that faculty from a variety of colleges can contribute courses to the program. This allows for greater diversity and potential creativity of the course offerings in the program. A third strength of the program is the two tiered system; students take two of the lower division general education courses in each of the three categories and one in upper division general education course each category. In addition, all of the general education courses require 10 pages of writing with feedback and revision.

Innovations

Course redesigns that incorporate active learning and include approaches to improve student learning have been undertaken across campus in undergraduate courses. The stimulus for many of these changes started with the UA AAU Undergraduate STEM Education Project (2014-2017). In the AAU project, we proposed to redesign foundation science courses to use evidence-based instructional practices that are student-centered and use active student engagement in the classroom. The initial courses were general chemistry, introductory biology, physics with calculus, chemical engineering, and computer programing for students in Electrical and Computer Engineering. Many research studies on teaching and learning have provided significant evidence that active learning and student engagement enhance student learning in foundation science classes. This was shown most convincingly in a meta-analysis of over 200 publications by Freedman and colleagues (PNAS, 2014). We had similar very positive outcomes in general chemistry, computer programing for electrical engineers, and physics with
calculus. There were also extremely positive outcomes in chemical engineering, but these have not been published, and introductory biology is undergoing continual improvements.

One result of the UA AAU Undergraduate STEM Education Project was significant participation by faculty in Faculty Learning Communities (FLCs) that provide informal professional development through meetings of a group of faculty meeting throughout the semester. To date, there have been over 300 individual faculty participants with nearly 100 faculty meeting in nine groups this semester; many of faculty have participated for multiple years. The participants in the FLCs discuss ways to improve teaching and how to teach using active learning pedagogies. They also participate in peer observations of teaching to help each other make improvements that enhance student learning. These faculty groups receive support from the Office of Instruction and Assessment (OIA).

Following a 2014 six-week pilot of AAU STEM Project faculty teaching in a collaborative classroom set-up in the Science and Engineering Library, we quickly learned that developing space conducive to active learning and student engagement was the most significant driver to develop culture change in teaching practices. The FLCs and OIA provide professional develop to help faculty teach in collaborative learning spaces (CLS) (30 by fall 2018). We currently have over 400 individual faculty from over sixty departments teaching in a CLS and many of them are teaching general education and foundation math courses. The active and student-centered course design has been implemented to improve learning and retention of knowledge and skills development.

The UA general education learning outcomes were approved by the Faculty Senate as institution-wide undergraduate learning outcomes. The assessment specialists in the Office of Instruction and Assessment are working with faculty and staff in the academic programs to align the general education outcomes with learning outcomes in the major. For this work, we are using Taskstream, a set of software programs marketed by Watermark. This program is easy to use and helps faculty collect and review assessment results from their courses and programs. The professionals from the Office of Instruction and Assessment have offered workshops and one-on-one training sessions on the use of Taskstream for the departments who are undergoing the Academic Program Review this year and will over the next year introduce the use of this program for assessment to all the academic programs on campus.

Another area of innovation has been the approach taken by UA Online to recruit some of the best and most innovative faculty who teach general education to develop and teach general education courses for online programs.

**Foundation Mathematics**

The Foundation Mathematics requirement falls into three levels: general-strand, moderated-strand, and science-strand that provide the appropriate level of math for future careers from
the appropriate majors. The general-strand is designed for students who will not use a significant amount or level of mathematics in the major or the predicted career. Students in this category take a math course focused on understanding the use of every day math (Math 105) or analytical thinking (Philosophy 110). The second level of foundation mathematics requirements is the moderate-strand. Courses that satisfy this requirement are Exploring and Understanding Data (Math 107) or College Algebra (Math 112). Student in majors that require the moderate-strand of math fall under several of the social and behavioral sciences who may also take a statistics course as a requirement in the major. Students in the science-strand take one or more of the calculus math courses to meet the general education requirements in the major. These different levels of foundation math requirements are structured to meet the needs of the students and the future graduates.

The math department is innovative in designing courses and class schedules that facilitate student learning. For example, the Department of Mathematics partnered with the College of Engineering to offer faculty-led supplemental instruction for a pre-calculus class that helped students catch-up and start calculus the next semester. Also, mathematics teaches a Functions of Calculus course that offers an assessment at three weeks. Students who earn at least a C, advance to First Semester Calculus; the other students drop back to Pre-Calculus to gain skills needed for calculus and avoid failing three units of calculus.

The Department of Mathematics teaches Math 100 online in small synchronous sections to provide additional college math preparation for students who need the help. Students have time to learn the material before advancing to the next class but also can advance through the material more quickly to the next class in their math sequence.

Another innovation added to offerings in mathematics requirement is a quantitative reasoning course for the moderate strand math requirement. The math reasoning in this course relates to common applications in everyday life with introductions to probability, numeracy, and data presentation and graphing. In many cases, this will be a course students might wish to take before taking one or more statistics courses.

Mathematics has redesigned the college algebra course to align better with peer institutions. In the past, this course included more content than is needed for a moderate strand of math. Now, the level is appropriate for students who do not intend to take higher levels of mathematics.

For majors that do not need college algebra, the math department developed a new quantitative literacy course called Exploring and Understanding Data that provides applications that relate to everyday life. This course satisfies the moderate strand of math for general education. It also provides a strong background for statistics courses.
Foundation Freshman Composition

Faculty in the Writing Program responsible for English Composition have been piloting the use of portfolios. There is a desire to select a specific portfolio program for campus that students will use to store written assignments in English Composition, General Education, and in the major. These assignments could be used for assessing critical, creative, and analytical thinking, writing, and other topics selected by programs for assessment of student learning. In addition, the portfolio might also serve as a student repository of written work, class projects, co-curricular projects, reflections, a resume and other useful documents. The use of a portfolio is expected to encourage students to engage in self-evaluation and reflection and help them map their path through college and a future career more easily.

Freshmen Composition offers courses that help students improve their writing based on their current skills. For example, they offer a four-credit ENGL 101A course that offers more time to learn writing skills than the three-credit traditional ENGL 101 course. They also offer three semesters of ENGL (106, 107, and 108) for students whose native language is not English and need more work in writing to be successful in college. Furthermore, Honor students take ENGL 109H which is only one semester and taught on a higher level than the other ENGL Comp classes while the average student takes two semesters of ENGL COMP (101 and 102). Like math, time-on-task is important for students learning writing skills.

Summary

Increased writing in GE courses, introduction of math courses relevant to everyday experiences (quantitative reasoning), active learning and group work in some GE classes, and increased focus on GE assessment enhance the undergraduate education and adds emphasis on skills employers indicate they need.

Future General Education Program at UA

The General Education Program is currently under review by a General Education Task Force that includes some faculty from the University-Wide General Education Committee, the Undergraduate Council, the Honors College, the Writing Program, the College Academic Administrators Council, the Faculty Senate, other faculty and administrators, and the student representative from the Undergraduate Council. They have been meeting since January 2018. In addition, the Strategic Planning Steering Committee charged by President Robbins has an interest in improving general education and formed a subcommittee to look at this issue and other curricular and pedagogy topics. Furthermore, Responsibility Centered Management is under review by the RCM Steering Committee. These three committees have overlap of participants and it is expected that there will be strong synergy leading to recommendations to the President for revisions in General Education. However, at this time, it is too early to know what suggestions will emerge.
CONCLUSION

The practices at the universities by definition are transformative in the context of quality. Also, not all of the elements may be innovative by themselves but are indeed innovative when designed as a system. For example, using cohorts, integrated general education course design, peer mentors, and digital technology along with competency-based education together is innovative. Moreover, these systems of instruction are student-centered and student success driven while maintaining the rigor of college curriculum. In terms of being exceptional, these elemental combinations are innovative and deserving of recognition when measurable outcomes are promoted to stakeholders and align with the university brand.

Additionally, Arizona’s public universities are undergoing transformations that embrace continuous improvement given the assessments and general education reforms currently underway. These are not limited to general education programming, but also include reforms to academic program assessment. The Arizona Board of Regents, as the governing body of the universities, has the unique position of providing value-added oversight as these reforms progress and are implemented in the near future.

STRATEGIC DISCUSSION QUESTIONS

1. How are/did you scale these innovations? Does scaling help to reduce costs and/or increase student retention?
2. What challenges have you encountered that suppress innovation?
3. How do these innovations impact faculty in terms of their role with regard to innovation, workload, engagement, etc.?
4. Do these innovations help to increase efficiencies and/or drive costs down while increasing students’ performance?
5. Where outcomes have not been identified, can you describe how you are measuring or plan to measure outcomes?

WHAT’S NEXT IN MAY?

General Education Quality Review Series Wrap-Up

1. What we learned
2. Outstanding items
3. Next steps for the Quality Project
APPENDIX

Arizona State University

APPENDIX 1.A: Success Rates in Redesigned General Education Courses

<table>
<thead>
<tr>
<th>Course Subject</th>
<th>Format Comparison</th>
<th>Pass Rate*</th>
<th>B or better**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology</td>
<td>Lecture</td>
<td>80%</td>
<td>58%</td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>96%</td>
<td>87%</td>
</tr>
<tr>
<td>Economics</td>
<td>Lecture</td>
<td>73%</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>80%</td>
<td>65%</td>
</tr>
<tr>
<td>Biology</td>
<td>Lecture</td>
<td>76%</td>
<td>53%</td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>88%</td>
<td>64%</td>
</tr>
<tr>
<td>History</td>
<td>Lecture</td>
<td>82%</td>
<td>71%</td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>93%</td>
<td>91%</td>
</tr>
<tr>
<td>College Algebra</td>
<td>Lecture</td>
<td>69%</td>
<td>38%</td>
</tr>
<tr>
<td>(average)</td>
<td>Adaptive-active</td>
<td>78%</td>
<td>62%</td>
</tr>
</tbody>
</table>

* Pass rate is percent of students earning A, B or C. (Not passing is D, E or W)
** Earned grade of B or better for students completing the class. (W is omitted because a grade cannot be assigned to a W.)
APPENDIX 1.B: Retention Rates for Students in Project LEAD

Project LEAD: Retention

<table>
<thead>
<tr>
<th>CI Range</th>
<th>Non-LEAD</th>
<th>LEAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 86</td>
<td>70.9%</td>
<td>81.6%</td>
</tr>
<tr>
<td>86 - 93</td>
<td>75.2%</td>
<td>79.4%</td>
</tr>
<tr>
<td>94 - 102</td>
<td>78.0%</td>
<td>80.3%</td>
</tr>
<tr>
<td>103 - 107</td>
<td>81.6%</td>
<td>87.8%</td>
</tr>
</tbody>
</table>

Fall 2016 to Fall 2017 Retention by CI
APPENDIX 1.C: Grade Point Averages for Students in Project LEAD

Project LEAD: GPA

FTFTF Fall 2016 GPA by CI

- LEAD
- Non-LEAD

- < 86: 2.22
- 86 - 93: 2.59
- 94 - 102: 2.67
APPENDIX 1. D: Bridging the Gap in Degree Attainment

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Retention</th>
<th>4-year graduation</th>
<th>5-year graduation</th>
<th>6-year graduation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pell &amp; 1st gen</td>
<td>Non-Pell &amp; Cont. gen</td>
<td>Pell &amp; 1st gen</td>
<td>Non-Pell &amp; Cont. gen</td>
</tr>
<tr>
<td>2007 N</td>
<td>78% (833)</td>
<td>79% (4,151)</td>
<td>27%</td>
<td>38%</td>
</tr>
<tr>
<td>2012 N</td>
<td>79% (1,282)</td>
<td>84% (5,603)</td>
<td>42%</td>
<td>53%</td>
</tr>
<tr>
<td>2016 P</td>
<td>83% (1,832)</td>
<td>85% (7,802)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P: Preliminary
APPENDIX 1.E: Bridging the Gap in Mathematics

<table>
<thead>
<tr>
<th></th>
<th>Pre-ALEKS</th>
<th>Post-ALEKS*</th>
<th>Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[High placement score]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pell &amp; 1st generation</td>
<td>63.6%</td>
<td>78.0%</td>
<td>14.4</td>
</tr>
<tr>
<td>Non-Pell &amp; continuing generation</td>
<td>71.2%</td>
<td>85.4%</td>
<td>14.2</td>
</tr>
<tr>
<td><strong>[Low placement score]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pell &amp; 1st generation</td>
<td>48.8%</td>
<td>66.7%</td>
<td>17.9</td>
</tr>
<tr>
<td>Non-Pell &amp; continuing generation</td>
<td>63.9%</td>
<td>75.8%</td>
<td>11.9</td>
</tr>
</tbody>
</table>

*Developmental math students are mainstreamed into college algebra post-ALEKS. In pre-ALEKS, the students already passed developmental math prior to enrolling in college algebra.
Appendix 2.A: First Year Learning Initiative Guidelines

WHAT IS THE FIRST YEAR LEARNING INITIATIVE?

The First Year Learning Initiative (FYLI) is a unique, locally-developed and faculty-driven program for building academic success in the early college career. There are currently over 85 FYLI-certified courses, including many of the highest-enrollment, highest-impact gateway courses at NAU. Typically, over 97% of first year students are enrolled in at least one FYLI course.

FYLI is based on the fact that students need – and want – high standards in their lower-division coursework. They also need to have those standards clearly communicated from the first moments of engagement with a course. To be successful, students need support, guidance, highly engaging pedagogy, and clear, frequent feedback. Through the FYLI development process, course coordinators collaboratively reshape their courses in order to meet these needs, focusing on three critical areas:

Socializing students for excellence
FYLI courses establish the attitudes, skills, and behaviors that enable students to succeed in the first year and beyond. Critical aspects include increased rigor and excellence and providing effective scaffolding for students to succeed.

Design
FYLI courses maximize student engagement through critical design features. These include requiring substantial student engagement beginning in the first week, setting high standards, and effectively using the learning opportunities in both the classroom and in the co-curriculum.

Coordination
Multi-section courses will also have clear coordination plans in place. Important practices are captured in a course Syllabus of Practice.
Appendix 2.B: NCAT Essential Elements of an Emporium Model

Taken from:  http://www.thencat.org/Guides/Math/CLMChapterI.html

Element #1: Redesign the whole course and establish greater course consistency.
Element #2: Require active learning and ensure that students are “doing” math.
Element #3: Hold class in a computer lab or computer classroom using commercial instructional software.
Element #4: Build in ongoing assessment and prompt (automated) feedback.
Element #5: Provide students with one-on-one, on-demand assistance from highly trained personnel.
Element #6: Ensure sufficient time on task.
Element #7: Monitor student progress and intervene when necessary.
Element #8: Measure learning, completion and cost.
Appendix 2.C: LMC Classroom Layout
Appendix 2.D: LMC Impact—Success in Subsequent Math Course

MAT125 (Precalculus) to MAT136 (Calculus)

<table>
<thead>
<tr>
<th></th>
<th>% Pass MAT136</th>
<th>% Pass MAT136</th>
</tr>
</thead>
<tbody>
<tr>
<td>A in pre-LMC MAT125</td>
<td>83.04</td>
<td>A in LMC MAT125</td>
</tr>
<tr>
<td>B in pre-LMC MAT125</td>
<td>65.54</td>
<td>B in LMC MAT125</td>
</tr>
<tr>
<td>C in pre-LMC MAT125</td>
<td>41.61</td>
<td>C in LMC MAT125</td>
</tr>
</tbody>
</table>

MAT125 (Precalculus) to MAT226 (Discrete Mathematics)

<table>
<thead>
<tr>
<th></th>
<th>% Pass MAT226</th>
<th>% Pass MAT226</th>
</tr>
</thead>
<tbody>
<tr>
<td>A in pre-LMC MAT125</td>
<td>81.65</td>
<td>A in LMC MAT125</td>
</tr>
<tr>
<td>B in pre-LMC MAT125</td>
<td>57.93</td>
<td>B in LMC MAT125</td>
</tr>
<tr>
<td>C in pre-LMC MAT125</td>
<td>37.14</td>
<td>C in LMC MAT125</td>
</tr>
</tbody>
</table>

MAT108 (Algebra for Precalculus) to MAT125 (Precalculus)

<table>
<thead>
<tr>
<th></th>
<th>% Pass MAT125</th>
<th>% Pass MAT125</th>
</tr>
</thead>
<tbody>
<tr>
<td>A in pre-LMC MAT108</td>
<td>87.18</td>
<td>A in LMC MAT108</td>
</tr>
<tr>
<td>B in pre-LMC MAT108</td>
<td>72.11</td>
<td>B in LMC MAT108</td>
</tr>
<tr>
<td>C in pre-LMC MAT108</td>
<td>49.01</td>
<td>C in LMC MAT108</td>
</tr>
</tbody>
</table>

MAT114 (Quantitative Reasoning) to MAT119 (Finite Mathematics)

<table>
<thead>
<tr>
<th></th>
<th>% Pass MAT119</th>
<th>% Pass MAT119</th>
</tr>
</thead>
<tbody>
<tr>
<td>A in pre-LMC MAT114</td>
<td>85.53</td>
<td>A in LMC MAT114</td>
</tr>
<tr>
<td>B in pre-LMC MAT114</td>
<td>64.75</td>
<td>B in LMC MAT114</td>
</tr>
<tr>
<td>C in pre-LMC MAT114</td>
<td>53.77</td>
<td>C in LMC MAT114</td>
</tr>
</tbody>
</table>

MAT100 (Mathematics Pathway) to Next Course

<table>
<thead>
<tr>
<th></th>
<th>% Pass MAT108</th>
<th>% Pass MAT114</th>
<th>% Pass MAT150</th>
<th>% Pass STA270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass pre-LMC MAT102X</td>
<td>60.52</td>
<td>72.20</td>
<td>65.91</td>
<td>56.69</td>
</tr>
<tr>
<td>Pass LMC MAT100</td>
<td>58.57</td>
<td>83.98</td>
<td>85.92</td>
<td>63.73</td>
</tr>
</tbody>
</table>
General Education Quality
Review Series No. 4: Innovation

Shelley McGrath, Ph.D.
V.P., Academic and Student Affairs
Arizona Board of Regents

March 22, 2018
Overview

Key takeaways
Innovation and quality
University outcomes
Strategic questions/discussion
What’s next in May?
Action items
Key Takeaways

- Innovation and quality general education
- System features:
  - Competency-based education
  - Faculty and peer mentoring
  - Analytics as a diagnostic tool
  - Co-curricular programs
  - Active learning
  - Space
  - Adaptive courseware and learning platforms
- Innovation and quality — transformative and exceptional?
  - Risk: external notions of “exceptional”
• **Quality + innovation = transformative**
  • *Transformative* is defined as changing policies and practices that result in improved student learning as well as students’ personal and professional potential.
    • Effective course design, instructional methods, outcomes and student engagement

• **Quality + innovation = exceptional**
  • *Exceptional* is defined as holding practices to the highest standards.
    • Results in elevating the status and prestige of a university as well as its brand
Innovation and Quality

System features

• Competency-based education models
• Faculty and peer mentoring
• Analytics
• Co-curricular
• Active learning
• Space
• Adaptive courseware and learning platform
• Faculty development
• Course redesign
## Arizona State University

<table>
<thead>
<tr>
<th></th>
<th>CBE &amp; Adaptive Courseware</th>
<th>Faculty/Peer Mentoring/TA</th>
<th>Analytics</th>
<th>Co-Curricular</th>
<th>Active Learning</th>
<th>Spaces</th>
<th>Instructional Technologies</th>
<th>Job Preparation</th>
<th>Assessment</th>
<th>Professional Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolios</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Redesign</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project LEAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
## Innovation and Quality - NAU

### Northern Arizona University

<table>
<thead>
<tr>
<th></th>
<th>CBE &amp; Adaptive Courseware</th>
<th>Faculty/Peer Mentoring/TA</th>
<th>Analytics</th>
<th>Co-Curricular</th>
<th>Active Learning</th>
<th>Spaces</th>
<th>Instructional Technologies</th>
<th>Job Preparation</th>
<th>Assessment</th>
<th>Professional Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>FYLI/Course Redesign</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year Seminar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation Courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Capstone Experiences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personalized Learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Boundarless @NAU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Innovation and Quality - UA

#### University of Arizona

<table>
<thead>
<tr>
<th>Course Redesign</th>
<th>CBE &amp; Adaptive Courseware</th>
<th>Faculty/Peer Mentoring/TA</th>
<th>Analytics</th>
<th>Co-Curricular</th>
<th>Active Learning</th>
<th>Spaces</th>
<th>Instructional Technologies</th>
<th>Job Preparation</th>
<th>Assessment</th>
<th>Professional Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Learning Communities</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Foundation Composition</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation Math</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Course Redesign</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Learning Communities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### University of Arizona

<table>
<thead>
<tr>
<th>Course Redesign</th>
<th>CBE &amp; Adaptive Courseware</th>
<th>Faculty/Peer Mentoring/TA</th>
<th>Analytics</th>
<th>Co-Curricular</th>
<th>Active Learning</th>
<th>Spaces</th>
<th>Instructional Technologies</th>
<th>Job Preparation</th>
<th>Assessment</th>
<th>Professional Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Learning Communities</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Foundation Composition</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation Math</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Course Redesign</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Learning Communities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Student Success

- **ASU Course Redesign:**
  - Passing rates and G.P.A. increase are significant
- **ASU Project Lead:**
  - Participants persisted at a higher rate and performed better (G.P.A.)
- **ASU Math:**
  - Pass rates for College Algebra improved by 18% for PELL and first-generation students
- **NAU Lumberjack Mathematics Center:**
  - Pass rates (A’s & B’s) for participants increased significantly
Strategic Questions/Discussion

1. How are/did you scale these innovations?

2. What challenges have you encountered that suppress innovation?

3. How do these innovations impact faculty in terms of their role with regard to innovation, workload, engagement, etc.?

4. Do these innovations help increase efficiencies and/or drive costs down while increasing students’ performance?

5. Where outcomes have not been identified, can you describe how you are measuring or plan to measure outcomes?
What’s Next in May?

• What we learned this year

• Further consideration

• Next steps for general education reform or academic program review
  • What is the proposed process by which general education program revisions/improvements takes place?
  • What are the stated objectives?
  • Who are responsible parties engaged in the changes/plan?
  • What sort of timeline and deliverables are in place?
What’s next for the board and universities?

• What additional information does the board need as we move forward?
• Are there any policy/procedural changes that need to be considered?
• What plans should we consider to meet the challenges?