What is Innovation?
“If I had 20 days to solve a problem, I would spend 19 days to define it.

- Albert Einstein
Innovation

• a new idea, device, or method

• the act or process of introducing new ideas, devices, or methods
Types of Innovation

- Tools
- Push vs Pull
- Technology and Products
- Solutions
- Organizational Models
- Process
- Design
- Philosophies
Creative Destruction
Shumpeterian Growth Model
University Innovation
Universities have commonly been associated with basic (or incremental) innovation.
Innovation Outcomes

- Improved value
- Greater efficiency
- Enhanced productivity
- Satisfaction of market and national/public needs
- Greater competitiveness
- Beneficial partnerships
- Better outcomes
- Improved quality of life
Innovation at ASU
ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural, and overall health of the communities it serves.
What does Arizona Want

The percentage of Arizona voters who:

- Acknowledge the broader value of higher education
- Believe graduating more degree-holders will improve Arizona’s economy
- Support a world-class education for all

The ASU Pathway

A → B

A → B → C₁, C₂, C₃, C₄, C₅
ASU Outcomes

People

Ideas

Things
ASU Teaching and Learning Realms

01
Full Immersion
On-campus
Technology Enhanced

02
Digital Immersion
Online
Technology Enhanced

03
Digital Immersion
Massive Scale
Technology Enhanced

04
Education through Exploration
Technology Enhanced
Innovation across ALL disciplines and platforms
#1 in the U.S. for innovation

2016 U.S. News & World Report

#1 ASU
#2 Stanford
#3 MIT
Innovation: Transdisciplinary Research

ASU Legacy of Discovery

- sustainability
- advanced materials & flexible systems
- humanities
- global development
- earth & space exploration
- entrepreneurship & innovation
- design & the arts
- informatics & computing
- bio & health
- education & learning
- social sciences
- science policy
- responsible innovation
Innovation: Teaching / Learning

Sustainability

Educational Access

Conscious Society

Health Care

AL
Adaptive Learning
Reimagining a flexible, efficient and student-centered course experience.

ME
Math Education
Reinventing the way students engage with mathematics education and establishing ASU's innovative, highly personalized approach as a national model.

GFA
Global Freshman Academy
Offering a unique, cost effective way to break down barriers to quality higher education.

GLN
Global Learning Network
Preparing international students for success in higher education and professional endeavors.

MC
Mayo Clinic
Partnering in the advancement of medical discoveries, tools, treatments and the delivery of medical education to enhance health outcomes.

P
Student Portal (MyASU)
Providing students with an accessible central hub for the information, tools, and services to support their success.

PA
Personalized Advising
Guiding students toward graduation through personalized academic advising that focuses on their talents and career goals.

S
Starbucks
Creating a more educated workforce by providing the opportunity for a high-quality education to all Starbucks partners.
Planning now for the kind of futures we want.

What knowledge needs to be produced for human betterment?

Can nanotechnology, synthetic biology, geoengineering and artificial intelligence be developed and governed responsibly? Should they be?
SFIS Faculty

**Dave Guston** (Yale/MIT)
Founding Director & Professor

**Andrew Maynard** (University of Cambridge)
Professor & Director, Risk Innovation Lab

**Lee Gutkind** (University of Pittsburgh)
Professor, Hugh Downs School of Communication & Writer in Residence, SFIS
“Godfather of creative nonfiction”

**Darlene Cavalier** (Temple and University of Pennsylvania)
Professor of Practice, CSPO & Founder, Science Cheerleader
CSI convenes writers, artists and other creative thinkers to collaborate with scientists, artists, engineers and technologists to reignite humanity’s grand ambitions for innovation.

Partners include Intel, NASA, the World Bank, the U.S. National Science Foundation.

Renowned futurist Brian David Johnson recently left Intel to join the CSI as its Futurist in Residence and SFIS as a Professor of Practice.
In 2006, SHESC merged traditional archeology with programs in global health, mathematics, and the social sciences.

10 years later, it is a leader in experiential learning, related field technologies and global inquiry.

In 2015, SHESC anthropologist Sarah Mathew became an inaugural Carnegie Fellowship winner, receiving $200,000 to expand her research on culture and war.
In 2006, the separate departments of Geological Sciences, Physics and Astronomy were merged into SESE.

Research is organized by transdisciplinary themes, not methodologies.

An SESE team is now leading its first moon mission (2018), building a NASA-quality mini satellite to search for hydrogen.

Craig Hardgrove, Postdoctoral Research Associate & Principal Investigator, LunaH-Map
Integrating academic and commercial space enterprises using ASU’s core strengths in space science, engineering, and education.
New Teaching Philosophy:

- Explore the unknown instead of mastery of the known
- Focus on transdisciplinary questions instead of disciplinary silos
- Design, develop, deploy and research interactive, exploration-based learning using digital platforms and teaching networks.
Global Freshman Academy

Earn freshman credit after completing digital immersion courses hosted by edX and designed and taught by ASU.

More than 40,000 students from 163 countries participated in GFA since August 2015.
Global Freshman Academy

edX

Founded in 2012 by Harvard and MIT.

Mission: Increase access, teaching and learning innovation and the advancement of education through research.

ASU is an edX charter member, along with MIT, Harvard, Berkeley, Caltech and others.

Anant Agarwal, CEO, edX, & Professor, Electrical Engineering and Computer Science, MIT
ASU Preparatory Academy

Two charter schools located in downtown Phoenix and East Mesa on the ASU Polytechnic campus.

Operating principles = “The Four Pillars”:

• Academics
• Partnership
• Leadership
• Innovation
Nearly 2,500 Students in PreK-12

1,000+ On Waitlist

76% Low-income students at Phoenix campus

330% Enrollment Increase in Three Years
ASU Preparatory Academy

Improved achievement levels across all grades:

- **Phoenix Performance**
  - 23% in Reading
  - 3.7% overall average growth in state

- **Polytechnic Performance**
  - 24% in Math
  - 3.6% overall average growth in state

Outpaces the state on average across all grades by:

- 20% in Reading
- 28% in Math
Innovation: Student Preparation

me3
Starbucks College Achievement Plan

Launched in June 2014 and expanded to all Starbucks partners in April 2015

4 years of full tuition coverage to partners who attend one of ASU’s 49 online degree programs

4,500 partners have enrolled to date

Goal: 25,000 graduates by 2025
Mayo Clinic and ASU

- Shared facilities
- Collaborative research
- Shared faculty, appointments and graduate students
- Mayo Medical School in Arizona in collaboration with Arizona State University (2017)
- Joint education programs
- Joint seed-fund program
- Proton-beam therapy program
- School for the Science of Health Care Delivery
Innovation: Future of Education

“The Must-Attend Event for Education Technology Investors”
- The New York Times
Culture of Innovation and Entrepreneurship

ASU Innovation Challenge

you are never too cool for startup school

ASU Startup School

NeoLight
(jaundice technology)
Culture of Innovation and Entrepreneurship

Furnace

Entrepreneurship Outreach Network

Fluidic Energy
Technology Transfer

FY15:

• 270 invention disclosures
• 63 U.S. patents
• 12 new start-up companies
• 81 major licensing and option transactions

Spinout companies based on technologies developed by ASU researchers have raised over $500 million in external funding as of FY15.
Innovation: Private Sector Engagement
Innovation: Sharing Resources and Best Practices Globally to Benefit Arizona

Higher Engineering Education Alliance Program (HEEAP)
Sharing Resources and Best Practices

A unique consortium of public research universities established to help more students from all socioeconomic backgrounds graduate from college.
Sharing Resources and Best Practices

OSU Oregon State University  KU The University of Kansas  Iowa State University  Purdue University  Michigan State University

ASU Arizona State University  Texas at Austin  The Ohio State University  Georgia State University  UCF University of Central Florida  UC Riverside
Our Future
The type of innovation that will revolutionize the future of education is not a tool, technique or device.

Real, meaningful disruptive innovation will come from collaboration.

We need your ideas, engagement and advocacy to help our students and Arizona to succeed.
For your ideas to grow
For your ideas to grow