

Arizona State University

Velocity of Change

Community Conversation 2018

“You never change things by fighting the existing reality. To change something, **build a new model that makes the existing model obsolete.”**

- Buckminster Fuller

King's Library - 1762





Until 1900, human knowledge
doubled every **100 years**



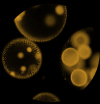
100 years



By 1945, it doubled
every **25 years**



25 years



Nanotechnology:
Every **2 years**



2 years



Clinical Knowledge:
Every **18 months**



18 months



Basic Human Knowledge:
Every **13 months**



13 months



The Internet of Things:
Every **12 hours**

12 hours

not visible to the naked eye





**Polio cases have
decreased by more than**

99%

1988-2018

**Life expectancy from
birth has increased**

8

years for men

10*

years for women





**Global literacy
is nearly
90%**

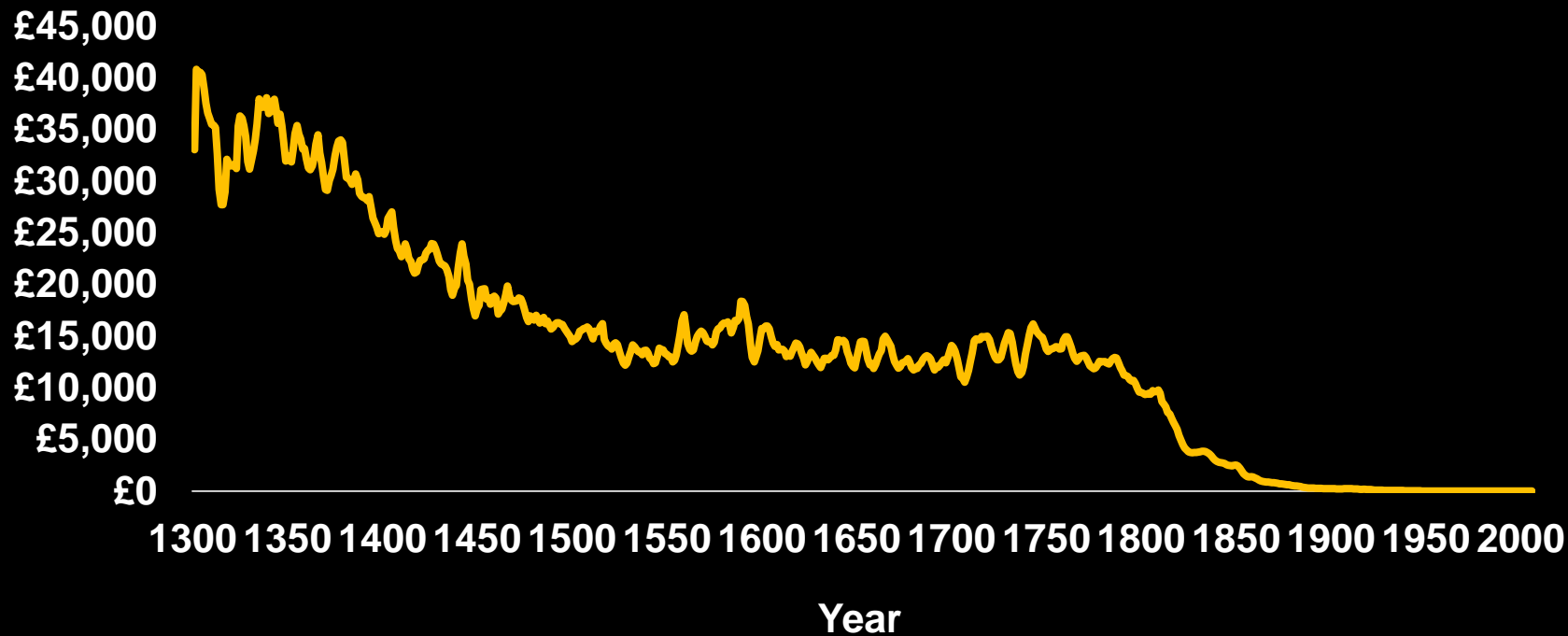
**People living in extreme
poverty has decreased by**

1 Billion

1988-2018



British Pounds per Million Lumen-Hours



65%

of children entering
primary school
today will ultimately
end up **working in
completely new
job types** that
don't yet exist.



A black and white photograph of four students in a computer lab. They are seated at desks with early desktop computers, which have large, light-colored cases and separate keyboards. The students are smiling and looking towards the camera. The desk is cluttered with papers, a telephone, and other office supplies. A yellow text box is overlaid in the center of the image.

Universities are slow to adapt

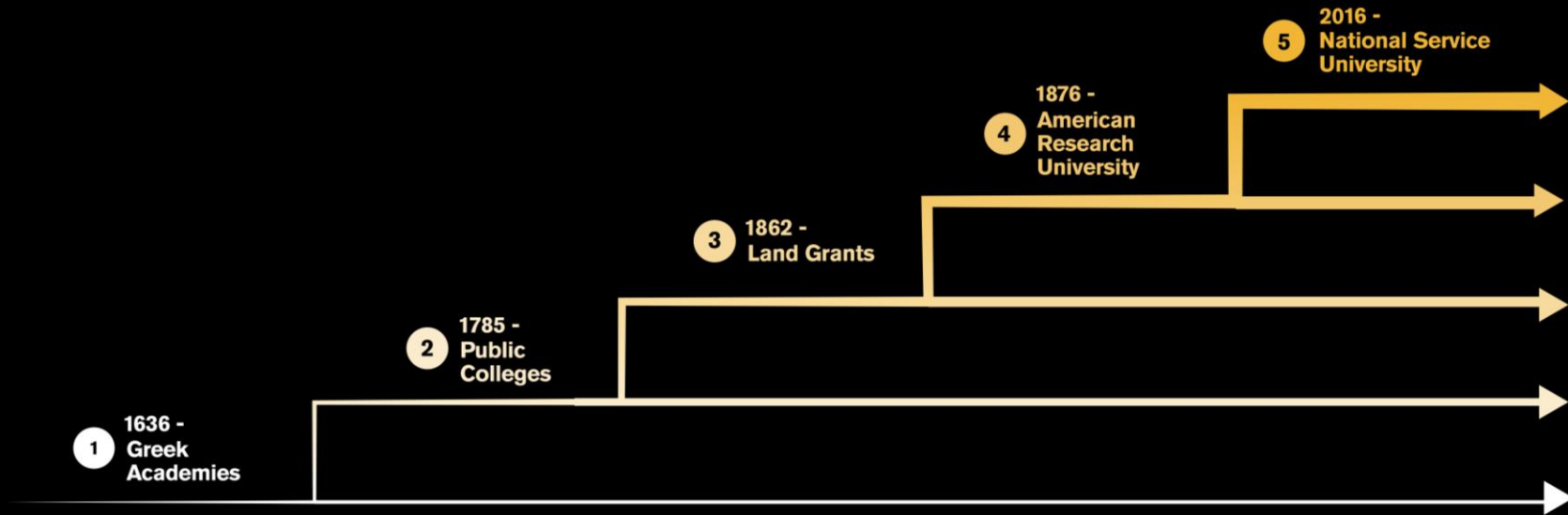
1 1636 -
Greek
Academies

2 1785 -
Public
Colleges

3 1862 -
Land Grants

4 1876 -
American
Research
University

5 2016 -
National Service
University





1988



\$9,770

state investment per FTE student

2017 Dollars

\$415 million

university operating budget

2017 Dollars

14.2%

four-year graduation rate

\$2,577

resident undergraduate
tuition and fees

2017 Dollars

<3%

undergraduates received
Pell Grants

9.9%

underrepresented minority
in freshman class

\$39 million

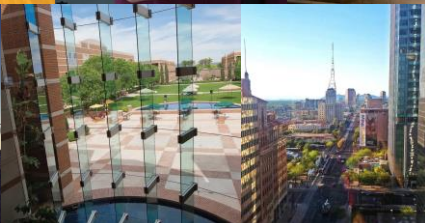
in annual research expenditures

4	Wisconsin – Madison
9	UCLA
13	Washington – Seattle
17	Texas – Austin
23	Ohio State

69	Hawai'i – Mānoa
71	New Mexico State
80	Oklahoma State
94	Mississippi State
105	Arizona State University

The image shows a modern building with a glass facade, heavily tinted with a yellow color. A black rectangular box is centered over the building, containing the year '2018' in white text. The building's glass reflects the surrounding environment, including trees and other structures. The overall composition is clean and minimalist, focusing on the year and the architectural background.

2018



#1 in the U.S. for innovation

#1 ASU #2 Stanford #3 MIT

– U.S. News & World Report 2016, 2017, 2018



Ahead of Carnegie Mellon, Northeastern,
Harvard, Duke, Georgia Tech, Purdue, Cornell,
USC, UT-Austin and Yale



Anthropology

1st

Ahead of:
University of Michigan
Harvard University
Stanford University

Geological and Earth Sciences

2nd

Ahead of:
Stanford University
MIT
PennState
University of Michigan

Social Sciences

4th

Ahead of:
Berkeley
Cornell University
UCLA
University of Pennsylvania

Graduate Debt by State

4th
Least

Less debt than:
Delaware
Minnesota
Connecticut

Humanities

4th

Ahead of:
Yale
Harvard University
Princeton University
Columbia University

Political Science

5th

Ahead of:
Berkeley
PennState
Duke University

Electrical, Electronic, and Communications Engineering

7th

Ahead of:
Stanford University
Carnegie Mellon University
MIT

10 Year Production Fulbright Student Awards

9th

Ahead of:
Stanford University
Princeton
University of Texas at Austin

HHS (including NIH) Funded Expenditures among Institutions without a Medical School:

9th

Ahead of:
Princeton University
Georgia Tech
Carnegie Mellon University

Political Science

10th

Ahead of:
Stanford University
Georgia Tech
UCLA
Columbia University

Business and Management

14th

Ahead of:
University of Chicago
Duke University
Columbia University

Engineering

19th

Ahead of:
Cornell University
Caltech
Carnegie Mellon University
Stanford University

ASU Charter

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.

\$3.1 billion

university operating budget

\$3,141

state investment per FTE student

50%

four-year graduation rate

71% for A students

46% for B students

64%

five-year graduation rate

80% for A students

61% for B students

\$10,792

resident undergraduate
tuition and fees

\$2,205

average net tuition paid by
resident undergraduates

Arizona Resident Undergraduates in 2016-17 Average Gift Aid Awards by Family Income

Tuition & Mandatory Fees

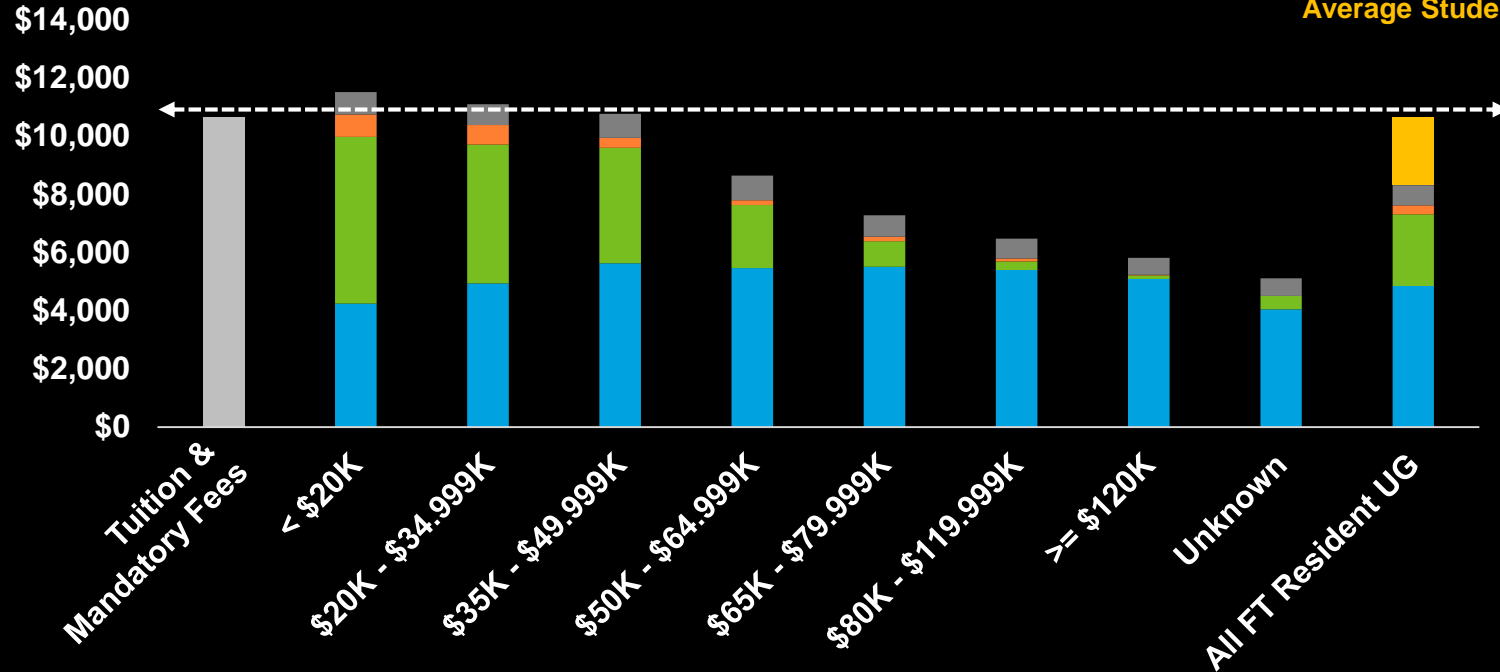
Institutional Gift Aid

Federal Gift Aid

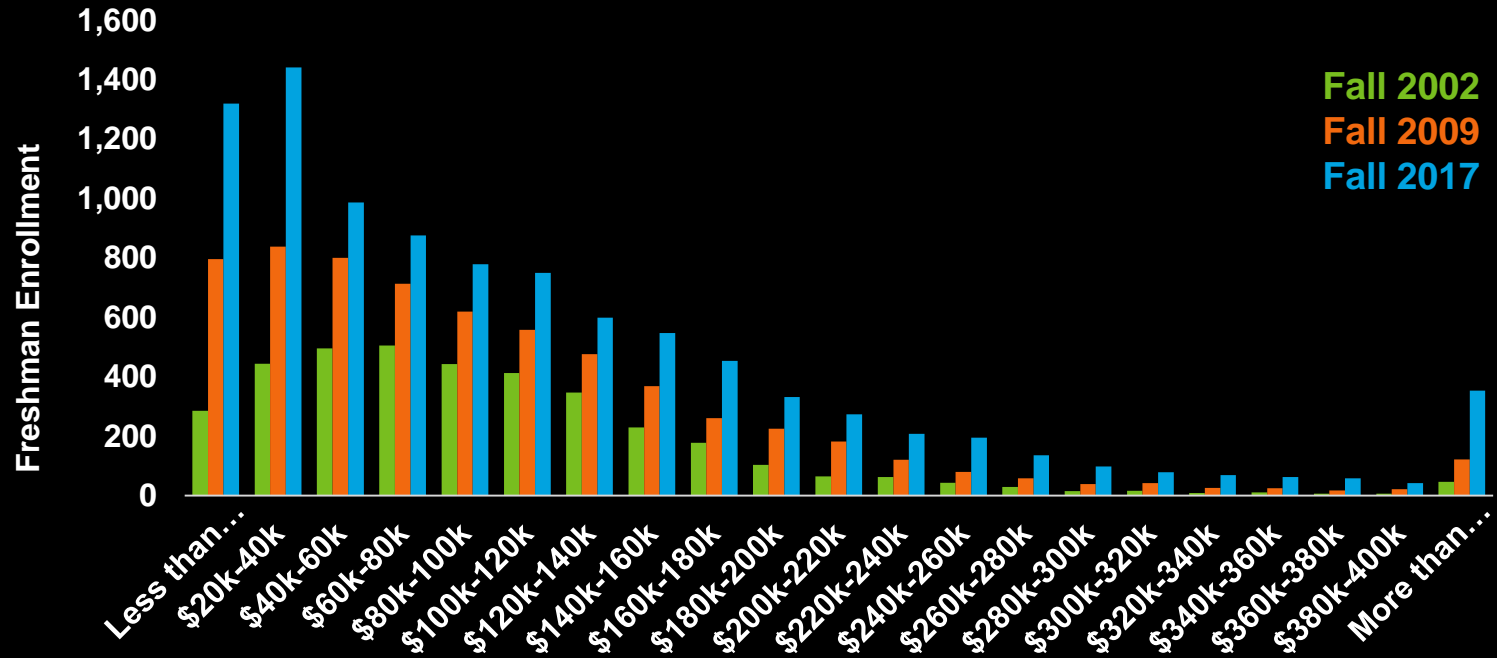
State Gift Aid

Private/External Gift Aid

Average Student Payment



ASU First-Time Full-Time Freshmen Enrollment by Adjusted Family Income



34.2%

undergraduates
receiving Pell Grants

40.8%

Arizona undergraduates
receiving Pell Grants

50/50

freshman class
diversity

\$545 million

in annual research expenditures

8	Wisconsin – Madison	28	UCLA
12	Washington – Seattle	51	Hawai'i – Mānoa
14	Texas – Austin	60	Mississippi State
22	Arizona State University	79	Oklahoma State
26	Ohio State	114	New Mexico State



2048

The old way of teaching

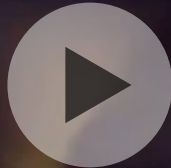




One possible future



Another possible future



**What might the
student of the future expect?**

A grayscale photograph of a person's hands holding a tablet. The tablet screen shows a design application interface with various panels and images. A semi-transparent dark rectangle with yellow text is overlaid on the center of the image. The background is blurred, showing a desk and a laptop.

**Seamless, uninterrupted access
to resources and experiences**

**Transparent, crowd-verified
information and accountability**



A collection of modular electronic components and smartphones arranged on a structure of light-colored wooden blocks. The components include various modules with camera lenses, microphones, and sensors. Some are integrated into smartphone-like frames, while others are standalone. The arrangement is creative and modular, suggesting a system for customizing user interfaces or experiences. The text "Freedom to personalize interactions, experiences and environments" is overlaid in a semi-transparent box in the center of the image.

**Freedom to personalize
interactions, experiences
and environments**

A black and white photograph of a man with glasses and a beard, wearing a t-shirt with a graphic, writing in a spiral notebook. He is holding a pen. On the desk next to him is a small, round smart speaker with a checkered top and the words 'TOOKER HOUSE' on its side. A cord is plugged into the back of the speaker. In the background, there is a framed photograph of a city scene with a bridge over a river.

**Unlimited access to crowdsourced
expertise and artificial intelligence
that provides personal guidance**



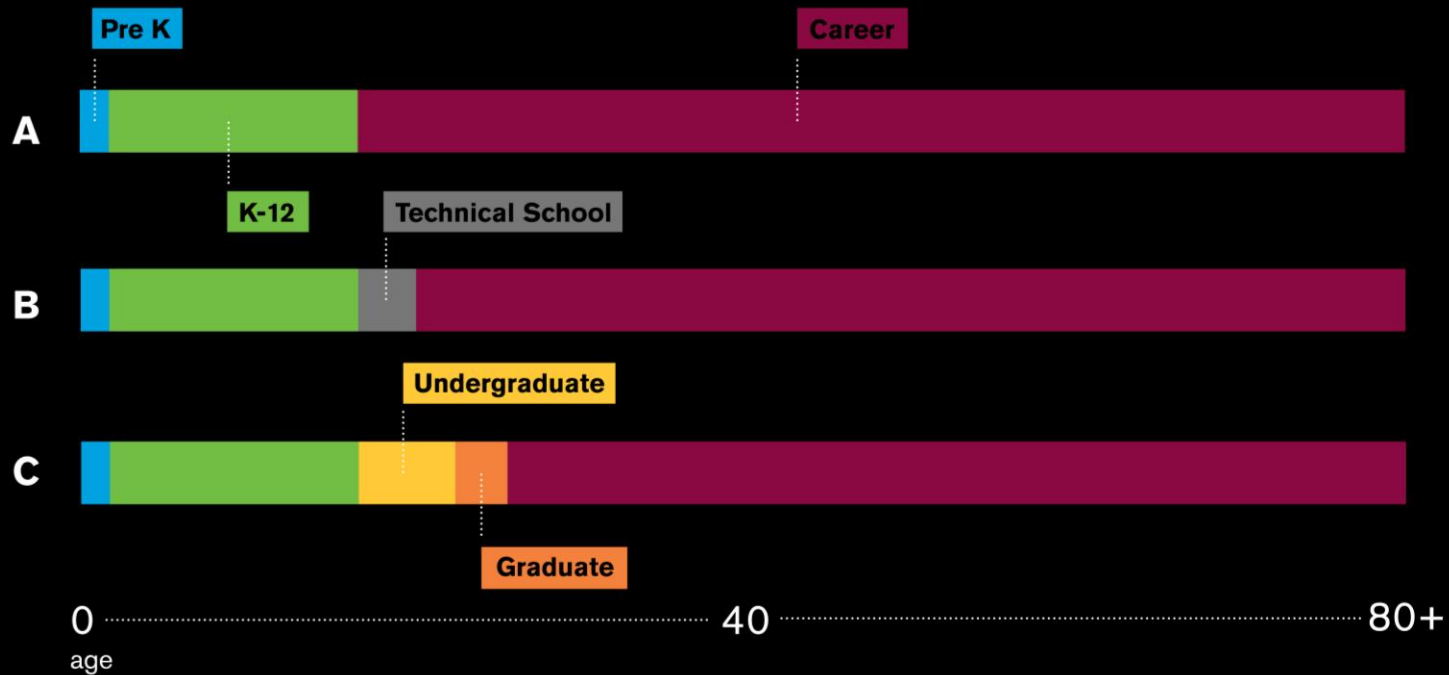
**Instantaneous and
convenient access**

A black and white photograph of a woman with curly hair wearing a Samsung Gear VR headset. She is holding the sides of the headset with both hands, appearing to be in a virtual environment. The background is blurred, showing what looks like a city street scene. A semi-transparent dark rectangle is overlaid on the image, containing yellow text.

**Immersive virtual environments
that facilitate socialization,
collaboration and entertainment.**

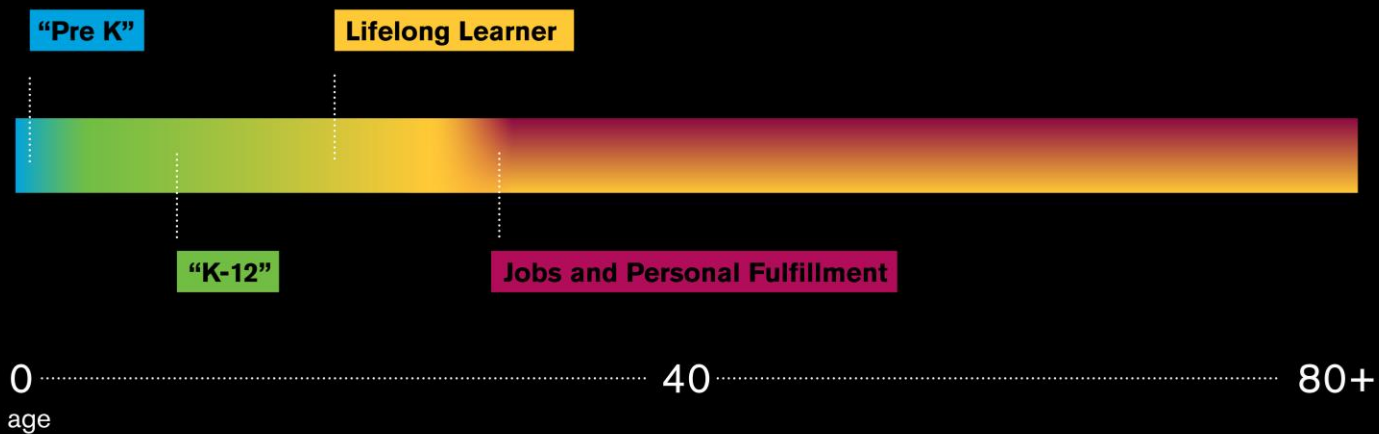
Now:

Distinct Life Stages



Future:

Universal Learning



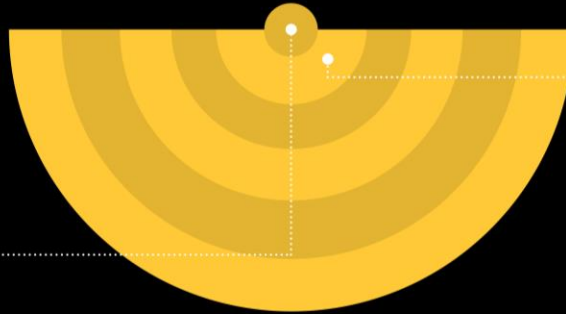
Universal Learning at ASU

Evolving a model capable of being of service to all learners, at all stages of work and learning, from all socioeconomic backgrounds, through educational, training, and skill-building opportunities

**Knowledge
Core**



**Knowledge
Core**



University

Faculty and Staff
Schools and Departments
Centers and Institutes
Libraries
Campus Resources

Full Immersion

Pre-K Learners
K-12 Learners
On-Campus ASU Learners



**Knowledge
Core**

Full Immersion

- Pre-K Learners
- K-12 Learners
- On-Campus ASU Learners

Digital Immersion

- Online Secondary and Postsecondary Learners
- Distance Learners
- Returning Non-Traditional Learners

**Knowledge
Core**



Full Immersion

Pre-K Learners
K-12 Learners
On-Campus ASU Learners

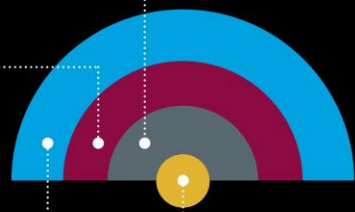
Digital Immersion

Online Secondary and Postsecondary Learners
Distance Learners
Returning Non-Traditional Learners

**Digital Immersion –
Massively Open**

Distance Learners (Global)

**Knowledge
Core**



Full Immersion

Pre-K Learners
K-12 Learners
On-Campus ASU Learners

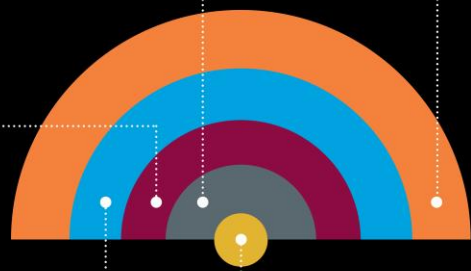
Digital Immersion

Online Secondary and Postsecondary Learners
Distance Learners
Returning Non-Traditional Learners

**Digital Immersion –
Massively Open**

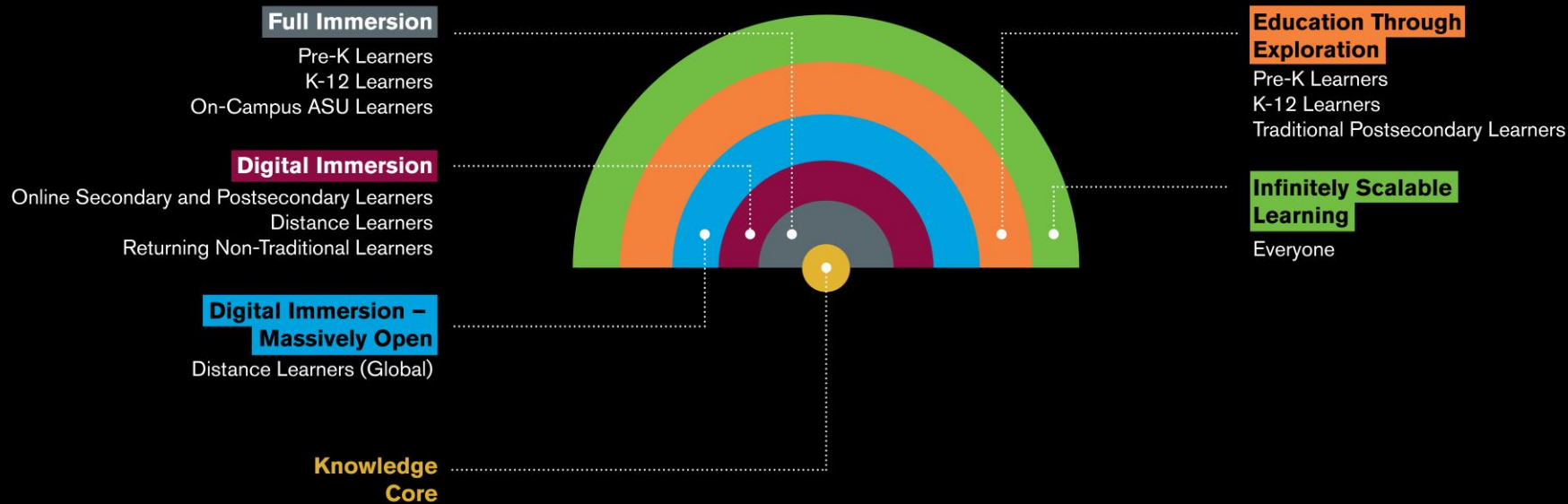
Distance Learners (Global)

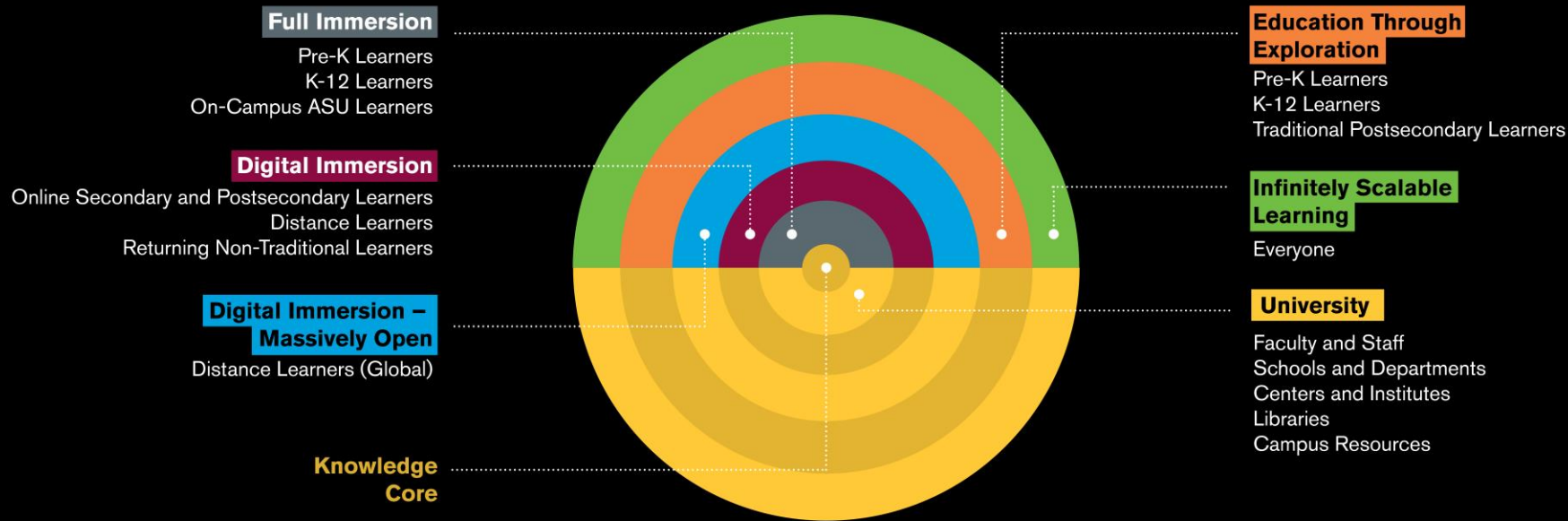
**Knowledge
Core**



**Education Through
Exploration**

Pre-K Learners
K-12 Learners
Traditional Postsecondary Learners





Digital Immersion

Technology to support human relationships and build organizational affinity

“Integrated” human-tutor interface

Real time assessment

Development-based assessment

Digital Immersion – Massively Open

Technologies that derive value from scale

Content and delivery for any life stage

Multi-organizational pathway mapping

Education Through Exploration

Virtual augmented reality for learning

Direct human cognition linkages

Intelligent tutoring through verbal query

Group learning tools

Full Immersion

21st century digital learning spaces

Artificial intelligence-based advising

Ubiquitous content delivery mechanisms

Intelligent tutoring platform

Personalized learning at scale

Math and Science Mastery for All

Knowledge Core

Infinitely Scalable Learning

Infinitely scalable teaching

Seamless integration of individualized learning across life stages

Lifelong intelligent tutoring

**What is ASU doing to serve
universal learners?**



**ASU Prep
Digital**
Arizona State University



ASU Prep Digital



Expanded Open Scale Offerings



ASU Online



**Global Freshman
Academy**

New Technologies: Virtual Reality Learning



PlanetWorks



PROJECT: SWAN DIVE SPACE TOURISM
SITE: VALLES MARINARIS BASE CAMP
LEADER: ELAINE CALHOUN

BioBeyond

Bring energy into the cell

The cell needs energy to function. Find a way to get 'food' into the cell



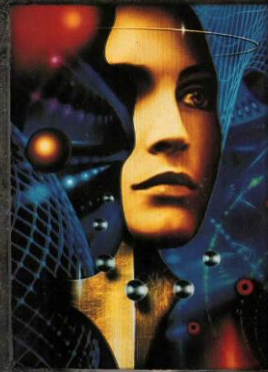
ASU Center for Education
Through Exploration
Arizona State University



AUTHOR OF SNOW CRASH
NEAL STEPHENSON

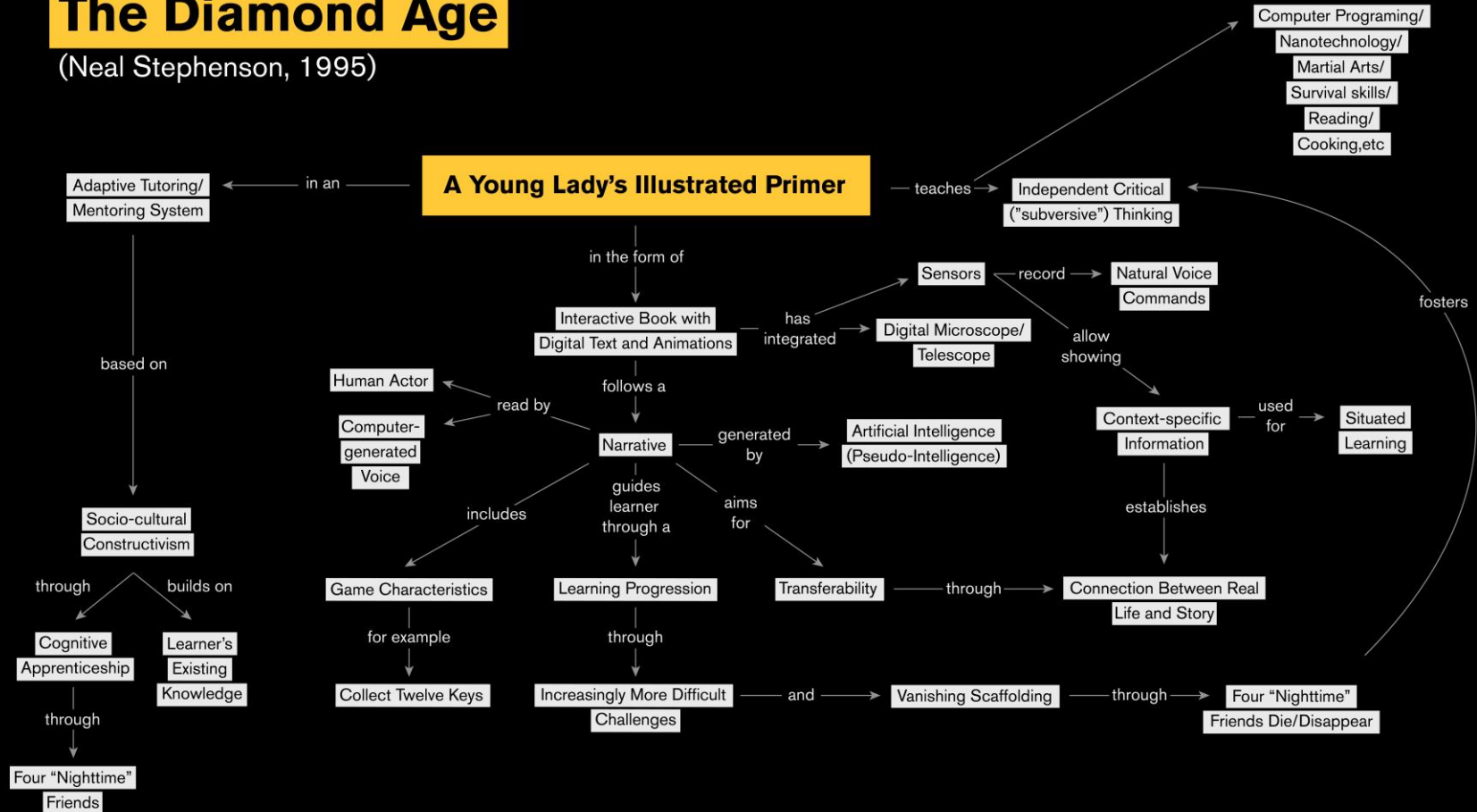
THE DIAMOND AGE

or, A Young Lady's Illustrated Primer



The Diamond Age

(Neal Stephenson, 1995)



ASU Luminosity Lab

