



The Center for Aviation and
Automotive Technological Education
Using Virtual E-Schools



Instructional Design

Center for Workforce Development and Clemson Online | April 28, 2017

Webinar Introductions



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Agenda

What we will learn about instructional design today:

- Get to Know Your Audience
- Identify Your Development Foundations
- Establish Your Work Plan
- Launch Your Course and Gather Feedback
- Questions and Answers

4 Pillars of Workforce Development



Digital Learning: Providing digital tools to increase access to information using virtual reality and e-learning

www.educateworkforce.com



Career Pathways, College Affordability & Graduation Improvement:

Developing scholarship opportunities, innovative articulation programs, and stackable certificate options for postsecondary education



K-12 STEM Education Initiatives:

Facilitating recruitment, professional development, student engagement, and outreach and support



Research, Advocacy & Networking:

Integrating education, industry, research, organizations and the public to create awareness of workforce development challenges and resources



CUCWD: The Clemson University
Center for Workforce Development



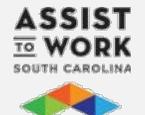
CA²VES: The Center for
Aviation & Automotive Technological Education
Using Virtual E-Schools



SELECT SC
Improving Manufacturing Competitiveness in The Palmetto State

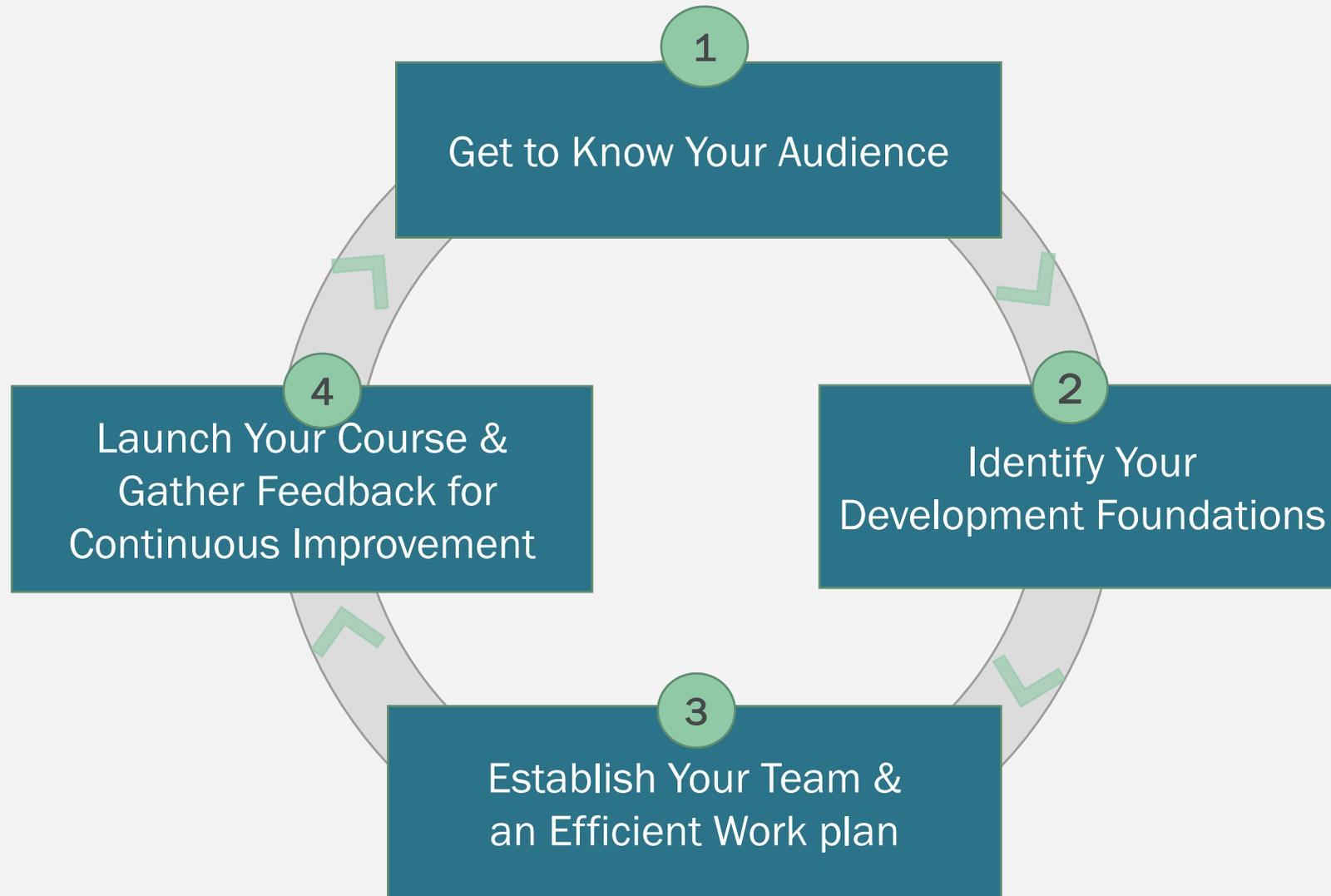


SCACCELERATE
EDUCATION >>> CAREER SUCCESS



ASSIST TO WORK
SOUTH CAROLINA

Instructional Design Process





Get to Know Your Audience

Focus Question 1

How does your audience affect the way you develop your online courses?

Please post responses in the chat window and make sure to share responses with “*Everyone.*”

Identify Your Audience

- Who are they?
- What are their expectations?
- What do they want or need?
- What are their obstacles?



How to Get to Know Your Audience

- Relationships
- Phone calls
- Research
- Forums and conferences
- Surveys, questionnaires, interviews



Our Audience

- Technical colleges
- Industry partners
- K-12 education
- State and Federal government



Developed through–

Relationships

Data collection

Providing venues for communication



Audience Drives Course Design



MSSC COURSES

Manufacturing Skills Standards Council (MSSC) Courses

- Who – Industry, Technical Colleges, K12 CTE
- Skilled Workforce
- Education Materials
- Career Pathways

Federal Aviation Administration (FAA) Courses

- Who – Industry, Technician Programs, Military, FAA
- Certified Technicians
- Online Education Materials
- Better Access to Courses



FAA COURSES

1

Get to Know Your Audience



2

Identify Your
Development Foundations

When It Does Not Work

Skills for Employment Success



SKILLS FOR
EMPLOYMENT SUCCESS

- Who – SC DEW, SC Job Ready U, Workforce
- Build Job Skills
- Increase Employment Participation

Our Team Did Not Consider

- Audience Expectations
- Knowledge Level
- Obstacles



EducateWorkforce Offerings



MANUFACTURING SAFETY



QUALITY IN MANUFACTURING



MANUFACTURING PROCESSES & PRODUCTION



MANUFACTURING MAINTENANCE



INTRODUCTION TO METROLOGY



BASIC ELECTRICITY



WORKFORCE FUNDAMENTALS



EXPLORING ADVANCED MANUFACTURING



EXPLORING ENGINEERING



SOFT SKILLS IN MANUFACTURING



PATHWAY TO TECHNOLOGY ENTREPRENEURSHIP

Question and Answers

Focus Question 1

How does your audience affect the way you develop your online courses?



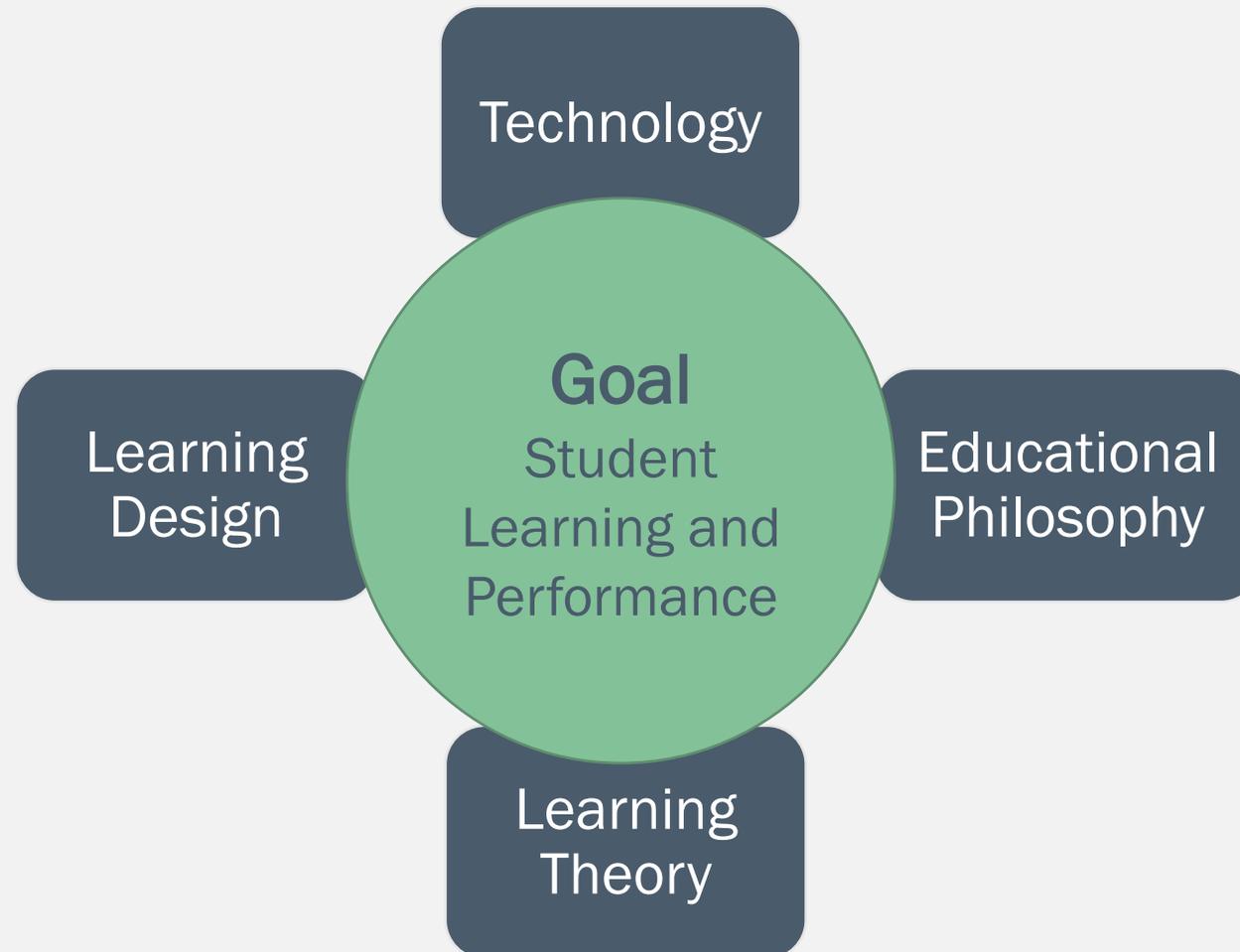
Identify Your Development Foundations

Focus Question 2

What do you use as a development foundation for your online courses?

Please post responses in the chat window and make sure to share responses with “*Everyone.*”

Tailored Approach to Course Design

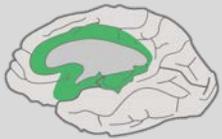


Learning Theory

CAST: Universal Design for Learning (UDL)

Principle 1

Affective Network



The **WHY** of Learning

Provide Multiple Means of
Engagement
to stimulate interest and motivation

Principle 2

Recognition Network



The **WHAT** of Learning

Provide Multiple Means of
Representation
to reach all learning styles

Principle 3

Strategic Network



The **HOW** of Learning

Provide Multiple Means of
Action & Expression
to provide options for expressing knowledge

UDL as a foundation for EducateWorkforce Curriculum

Principle
1

Affective Network



The **WHY** of Learning

Provide Multiple Means of
Engagement
to stimulate interest and motivation

- ✓ Assessments are interactive, authentic, & allow for self-evaluation
- ✓ Learning materials provide opportunities for tactile manipulation of virtual and web-based resources
- ✓ Scaffolded learning is provided in the form of Introductions, Summaries, Connecting to New Knowledge, schedules, progress tracking, etc.



Activities & Assessments



ePub



Virtual Reality



Glossary

UDL as a foundation for EducateWorkforce Curriculum

Principle
2

Recognition Network



The *WHAT* of Learning

Provide Multiple Means of
Representation
to reach all learning styles

- ✓ Key content presented in multiple formats
- ✓ Key terms are highlighted and defined
- ✓ Content adheres to web accessibility standards



Open Text & ePub



Video Lectures



Virtual Reality

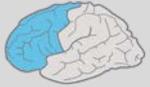


Glossary

UDL as a foundation for EducateWorkforce Curriculum

Principle
3

Strategic Network



The *HOW* of Learning

Provide Multiple Means of
Action & Expression
to provide options for expressing knowledge

- ✓ Items vary in format:
Multiple Choice, True/False,
Drag & Drop, Open Response with
Rubrics, Virtual Manipulatives



Activities &
Assessments



Virtual Reality

Question and Answers

Focus Question 2

What do you use as a development foundation for your online courses?



Establish Your Team & Work Plan

Focus Question 3

What is the work plan for your development team how is it helpful to your development process?

Please post responses in the chat window and make sure to share responses with *“Everyone.”*

Who Do You Need on Your Team?

Depends on:

- Organization Size
- Scope of the Course
- Types of Learning Materials
- Skill combination of Team Members
- External or internal development



EducateWorkforce Team

Internal

- Instructional Designer
- Programmer/Developer
- Virtual Reality Developer
- Graphic Designer
- Quality Assurance Personnel



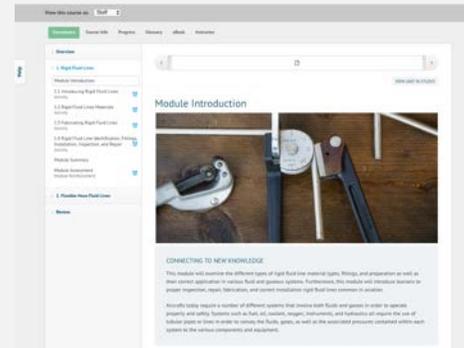
External

- Subject Matter Expert
- Videographer
- Instructional Designer
- Editor

EW Team Roles

EducateWorkforce Team

- Instructional Designer
- Programmer/Developer
- Virtual Reality Developer
- Graphic Designer
- Subject Matter Expert
- Videographer
- Quality Assurance Personnel

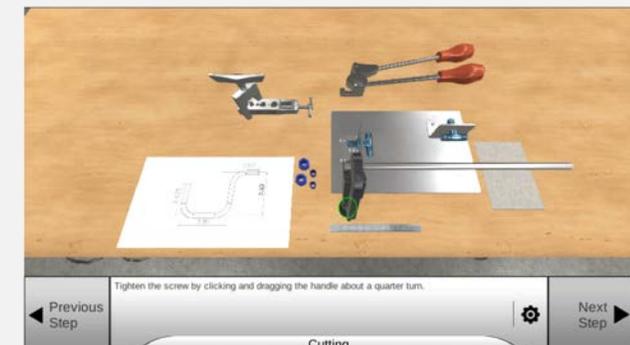
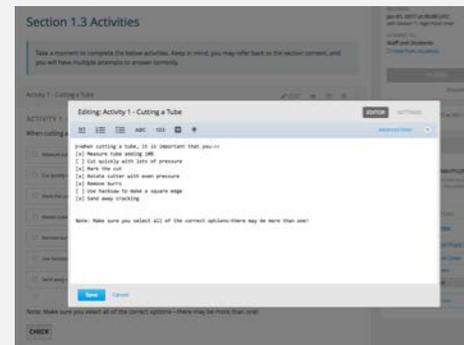


Calculating Center of Gravity (CG)

Calculate Moment for each weight
 $\text{Moment} = \text{Weight} \times \text{Arm}$

Item	Weight (lb)	Arm (inches)	Moment (in-lb)
50 pound weight	50	+30	1,500
125 pound weight	125	+60	
80 pound weight	80	+95	
50 pound weight	50	+125	
90 pound weight	90	+145	
100 pound weight	100	+170	
Total	Total Weight	Center of Gravity	Total Moment

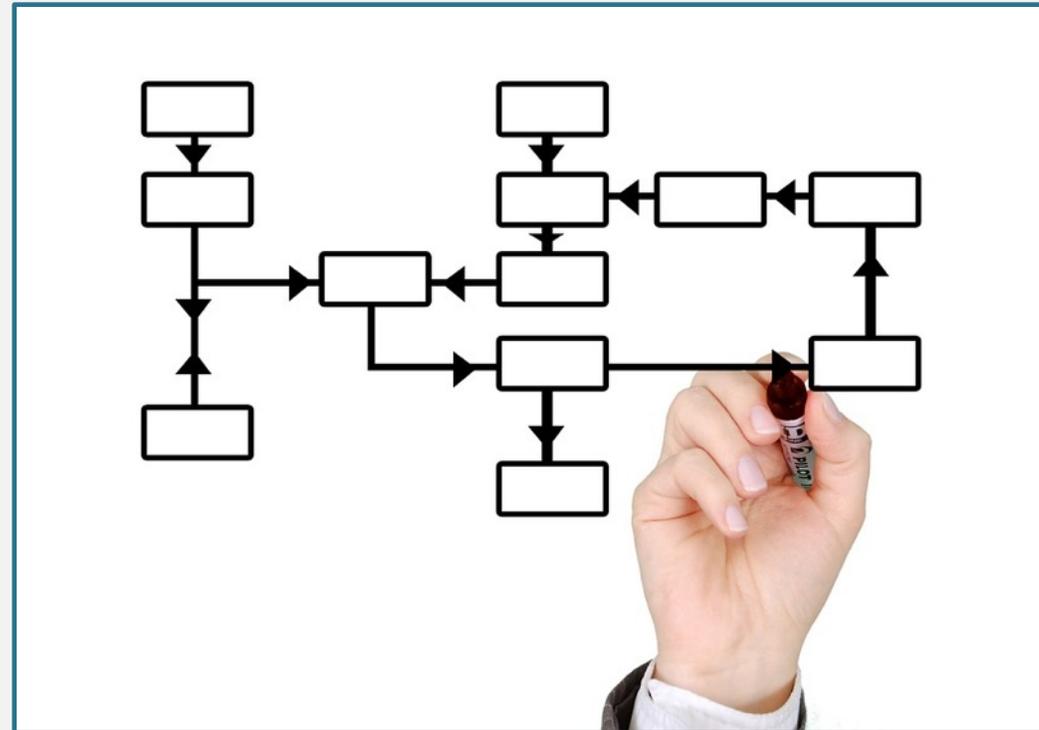
The diagram shows a horizontal beam with a triangular weight distribution. The top vertex is labeled 'M'. The base of the triangle is on the beam, with a vertical line from the top vertex to the base labeled 'A'. The beam is supported by a fulcrum, and the distance from the fulcrum to the center of gravity is labeled 'CG'.



Establish a Work Plan

Adaptive Approach

- Structured
- Iterative
- Monitoring



Structure

Structured

- Templates
- Course organization
- EducateWorkforce LMS
- Project management system

Templates

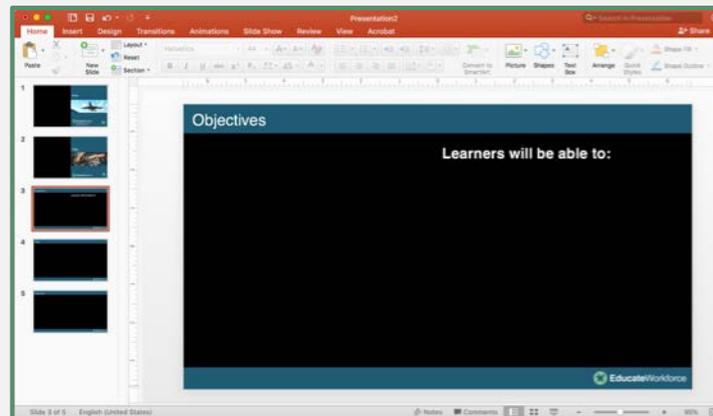
Course Development Template

Course 3 ~ Course Title

[Link to Progress Tracking Spreadsheet](#)

X. Module (Textbook Page Numbers)
X.X Lesson Name

- 1. Types and Forms of Corrosion (1-7)**
 - 1.1. Types of Corrosion
 - 1.2. Forms of Corrosion
 - 1.3. Factors Affecting Corrosion, Preventive Maintenance, and Inspection
- 2. Corrosion Prone Areas and Removal (7-11)**
 - 2.1. Common Trouble Areas
 - 2.2. Corrosion Removal
- 3. Categories of Metal Corrosion and Their Treatments (11-17)**
 - 3.1. Corrosion of Ferrous Metals



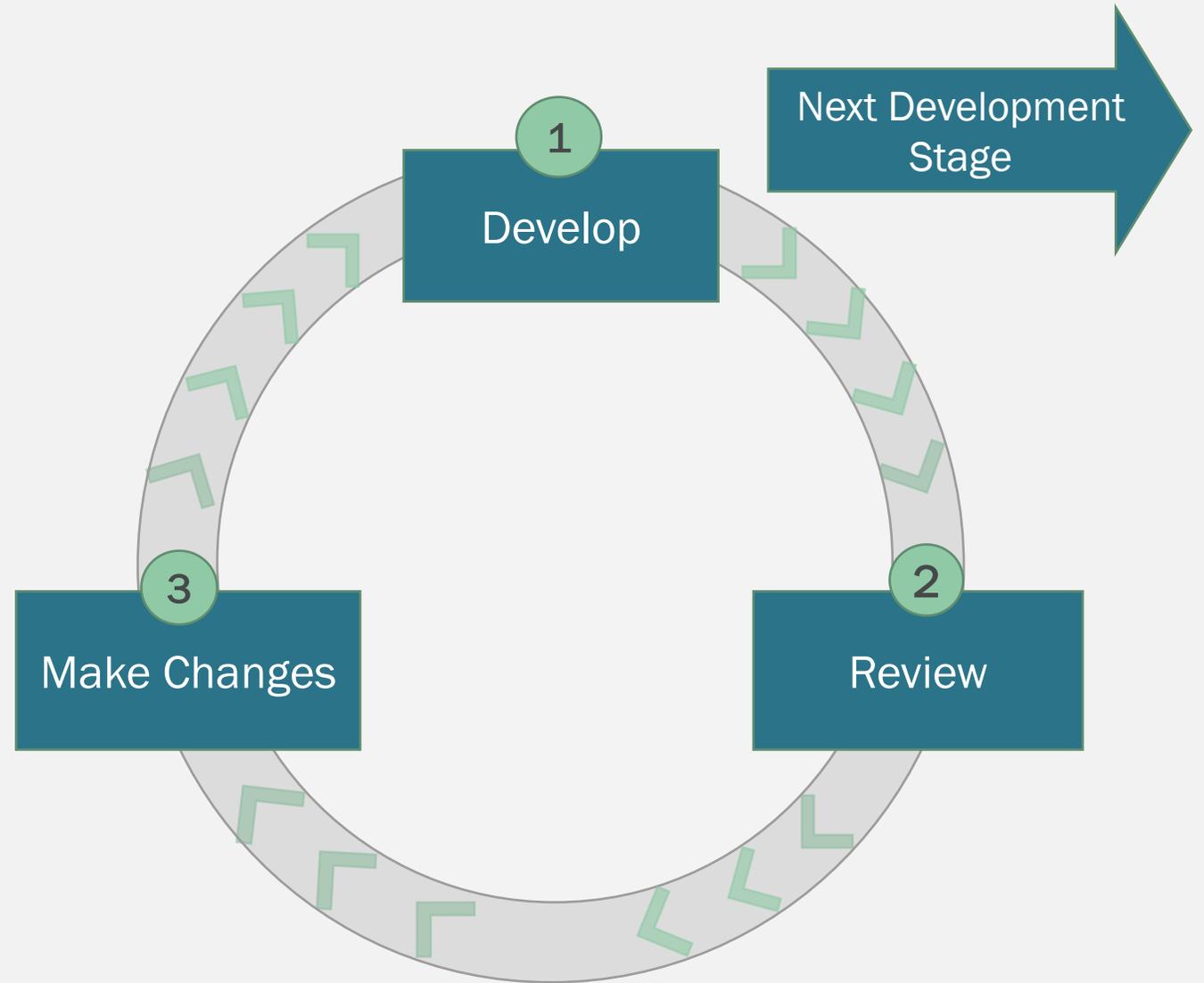
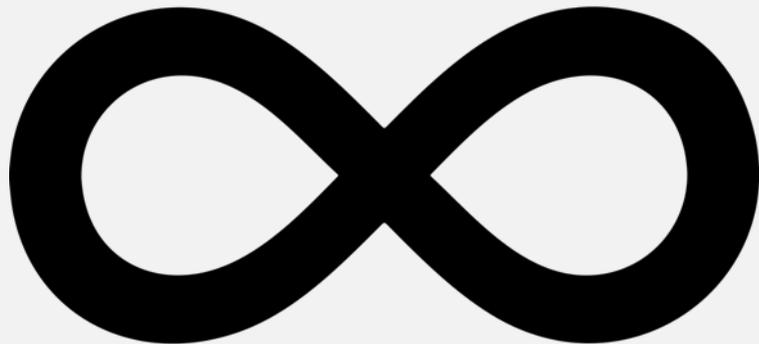
A screenshot of the EducateWorkforce LMS interface. The top navigation bar includes "Course Info", "Progress", "Classroom", "eBook", and "Instructor". The main content area is titled "Module Introduction" and features a photograph of various tools used in aviation maintenance, such as a torque wrench, a dial indicator, and a pair of pliers. Below the image, there is a section titled "CONNECTING TO NEW KNOWLEDGE" with introductory text, a "GOAL" section, "OBJECTIVES", and "ORIENTING QUESTIONS". A sidebar on the left shows a course outline with sections like "1. Rigid Fluid Lines" and "2. Flexible Hose Fluid Lines".

Learning Management System

Iterative

Iterative

- Develop
- Review/Feedback
- Make Changes



Monitoring

Monitoring

- Project management
- Communication
- Regular meetings



Question and Answers

Focus Question 3

*What is the work plan for your development team
how is it helpful to your development process?*



Launch Your Course and Gather Feedback

Focus Question 4

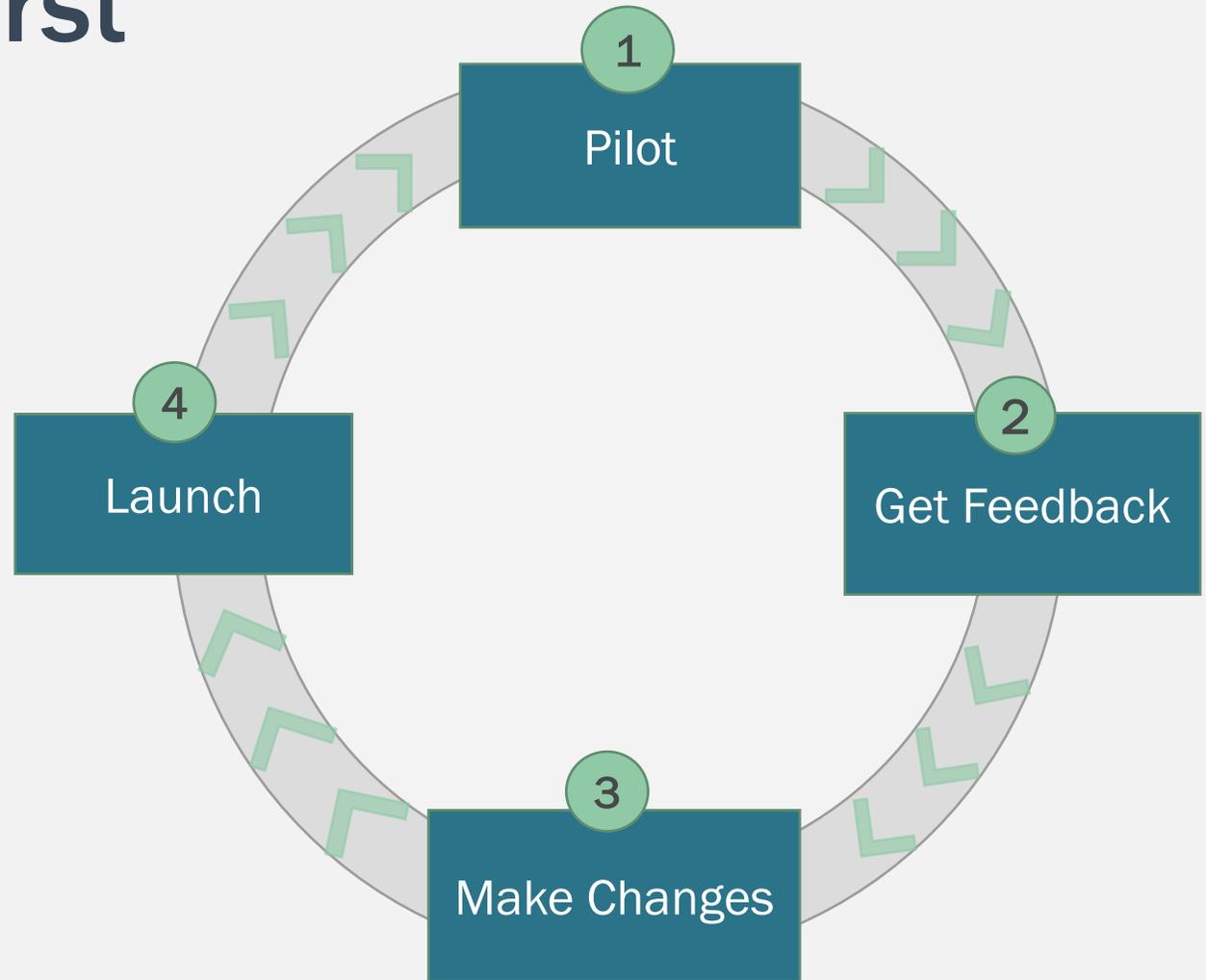
What tool do you use to gather feedback and why do you think this tool is helpful?

Please post responses in the chat window and make sure to share responses with “*Everyone.*”

Pilot the Course First

Course Pilot Model

- Pilot
- Get Feedback
- Make Changes
- Launch



How to Get Feedback

Tools for Collecting Feedback

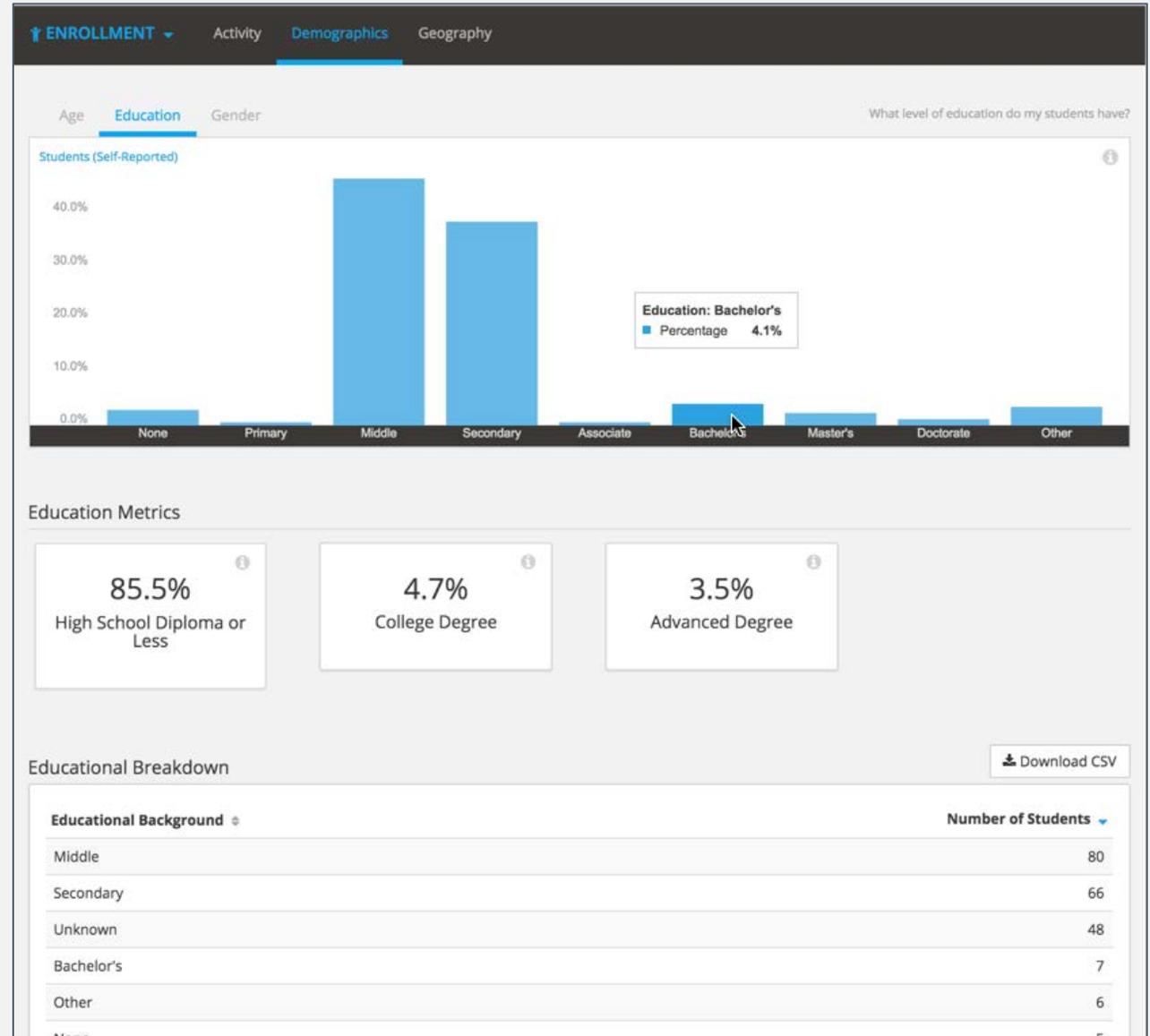
- Analytic Software
- Pre/post test
- Questionnaires
- Embedded Questions
- Interviews
- Focus groups



Analytic Software

Captures Demographics

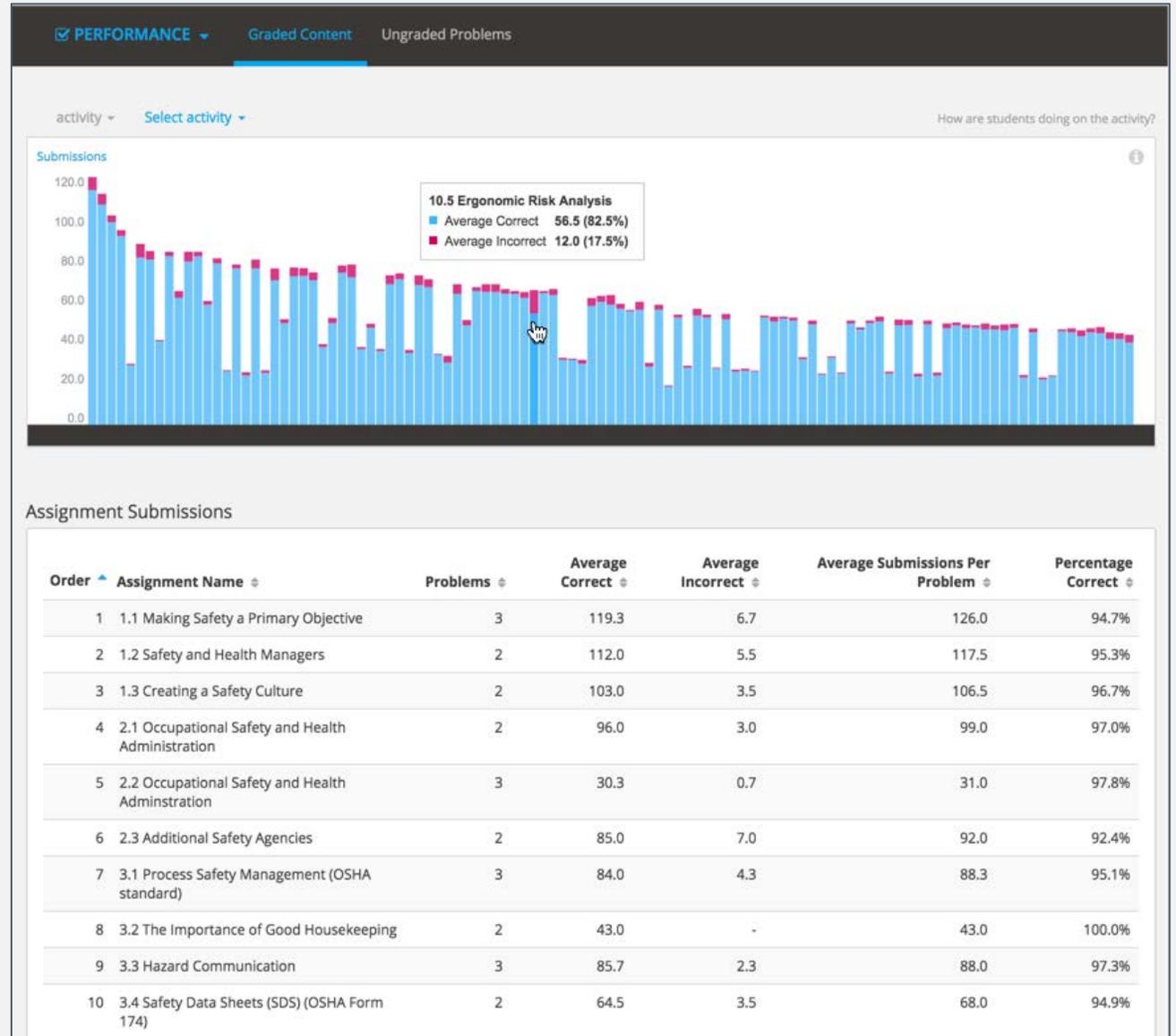
- Age
- Gender
- Education
- Enrollment



Analytic Software

Captures Performance

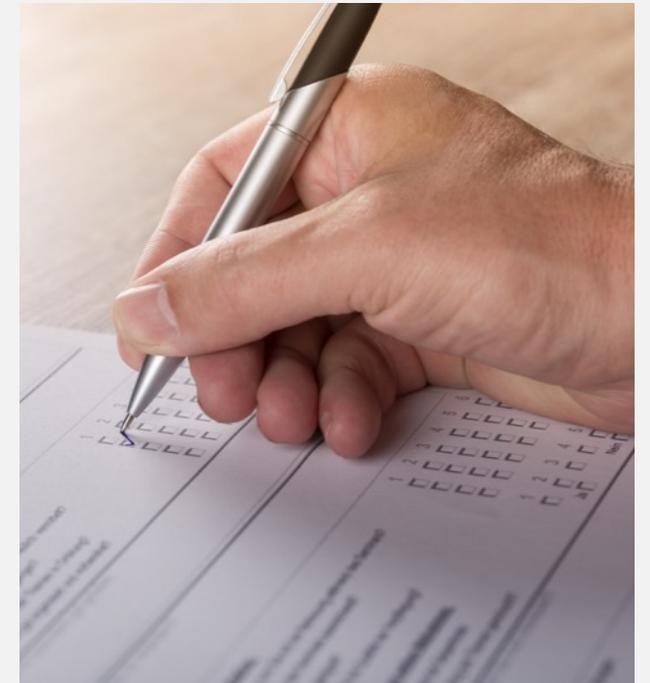
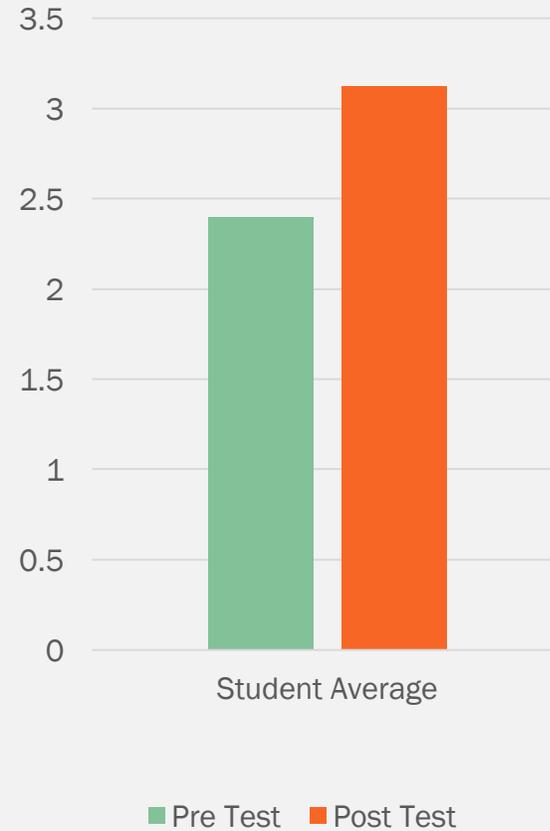
- Average correct
- Average incorrect responses
- Average submissions per problem



Pre and Post Tests

Measuring Outcomes

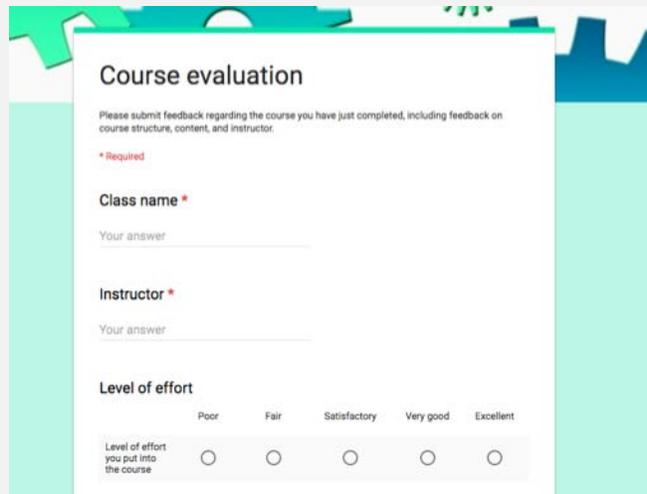
- Measures prior knowledge
- Measures knowledge after the course
- Comparison provides measure of learning
- Informs instructional improvements



Questionnaires

Questionnaires

- Objective, valid, reliable
- Easily implemented
- Data easily analyzed



Course evaluation

Please submit feedback regarding the course you have just completed, including feedback on course structure, content, and instructor.

*** Required**

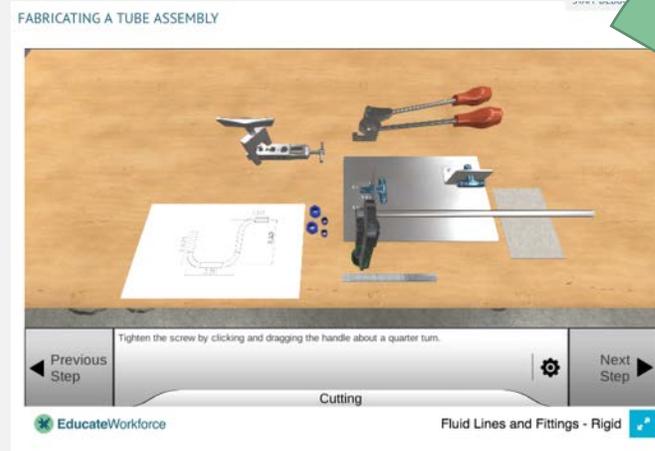
Class name *
Your answer _____

Instructor *
Your answer _____

Level of effort

Poor	Fair	Satisfactory	Very good	Excellent
<input type="radio"/>				

Level of effort you put into the course



Embed Questions

- Ask within the course
- Test efficacy of teaching tool

This simulation improved my ability to construct a tube assembly.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Interviews and Focus Groups

Interviews

- Provides greater detail and depth
- Adds human dimension to statistical data
- Opportunity to seek clarification
- Student voice heard



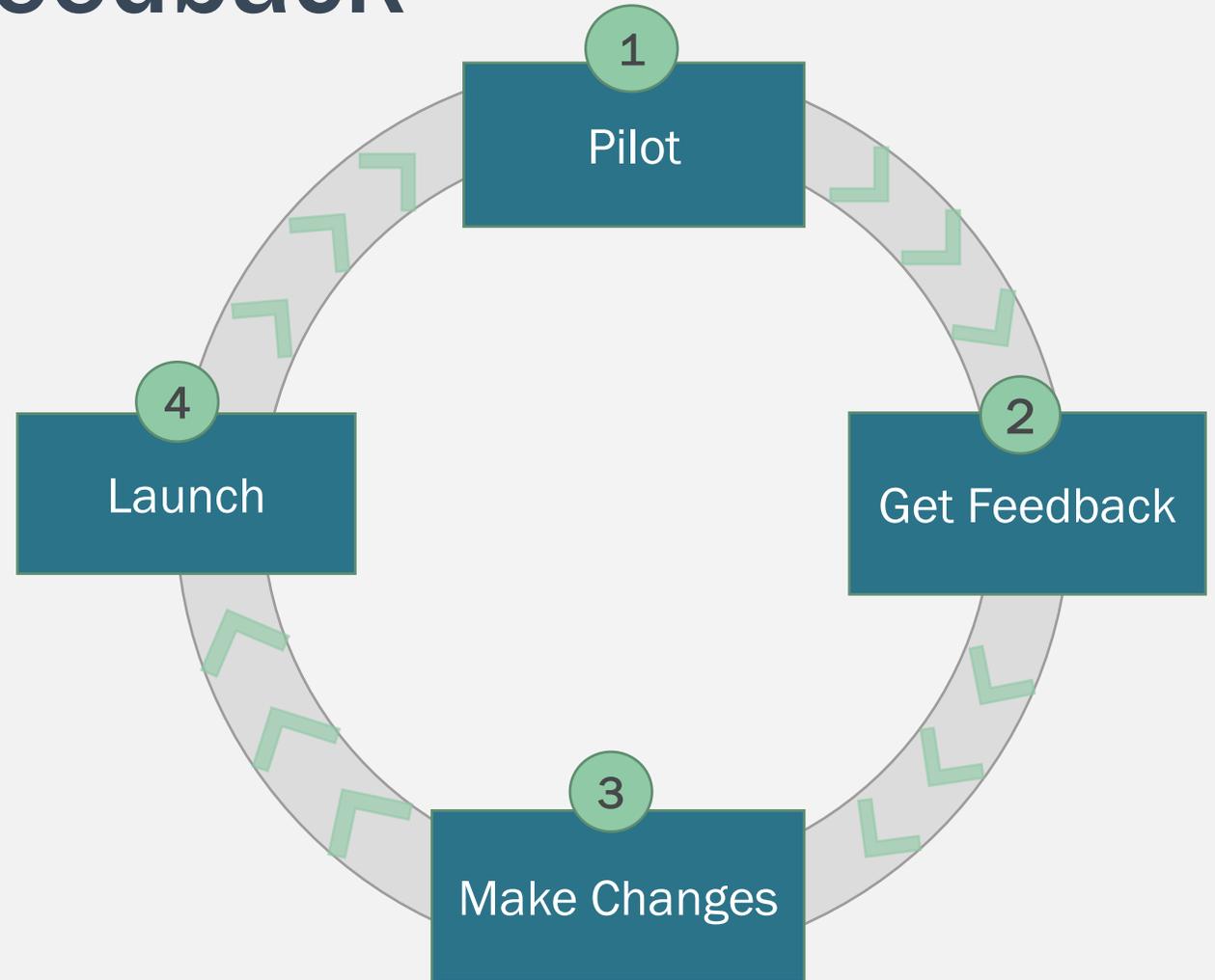
Focus Groups

- More efficient than single interviews
- Details about group feelings and perceptions
- Broader range of information

Evaluating Course Feedback

Compare Goals with Student Feedback

- Were we successful?
- Did students learn?
- Did they have fun?
- What should you change?
- Make changes and launch again



Question and Answers

Focus Question 4

What tool do you use to gather feedback and why do you think this tool is helpful?



Question and Answers
